proposition of the form 'If p then q,' and another of the form 'p' a proposition of the form 'q' can be inferred. Since the rules of inference operate only on the form of the propositions involved and not on their content, deductively valid inferences can also be characterized as being valid in virtue of their form alone (see *Logical Form*; *Propositional Calculus*; *Natural Deduction*).

2. Inductive Inference

It has been argued that the study of deductive inference is not sufficient for an adequate understanding of the way people actually reason. In science as well as daily life, conclusions need to be drawn which, in the light of some premises, are likely to be true. This is the domain of nondemonstrative or *inductive* inference. It has received much attention from philosophers of science, from scholars working on argumentation theory, and more recently, from those working on artificial intelligence.

In the philosophy of science, interest in induction was aroused by the successful use in natural science of the empiricist principle, that is, the principle that all knowledge ultimately derives from experience. This requires some justification of the step from the particular truths known from experience to the empirical generalizations that could serve as premises in subsequent logical deductions. Since in inductive inference the conclusions do not follow conclusively, but with *probability*, investigations have focused on the latter notion.

2.1 Probability: A Statistical Approach

According to the *statistical* approach, probability—conceived as the degree to which the conclusion of any nondemonstrative argument is supported by its evidence—can be assessed by means of a so-called 'statistical syllogism' of which the major premise states how frequently, in the long run, a certain type of event will as a matter of fact occur:

Of all the things that are A, m/n are B
a is an A
therefore, with a probability of m/n, a is B

As a rule of inductive inference, however, the statistical syllogism has a serious problem, for it is capable of leading to paradoxical results. Suppose there is an individual, Tom, who is known to be a Texan, and who is a philosopher as well. Suppose, furthermore, that we have statistical evidence that 1 percent of all philosophers, and 99 percent of all Texans are millionaires. Then, using the syllogism, we can infer that Tom most probably (99 percent) is a millionaire, as well as that it is highly improbable (1 percent) that Tom is a millionaire.

2.2 Probability: Degrees of Confirmation

A different approach which is still controversial stems from the philosopher Rudolf Carnap (see Carnap 1950 and *Carnap, Rudolf*) who took 'probability' primarily to mean 'degree of confirmation.' Probability taken in this sense is a logical relation between two sentences, a hypothesis h and a sentence e reporting, say, a series of relevant observations. What makes this approach so different is that the value of the degree of confirmation of a hypothesis h with respect to evidence e, $c(h, e)$, is calculated on the basis of a definition of c. Roughly speaking, the theory lays down for every atomic statement the degree of confirmation with respect to every sentence reporting a minimal, or atomic, piece of evidence. In addition, combination-rules are given which specify how the degree of confirmation of a complex statement with respect to a complex piece of evidence is derived from those for the atomic statements to pieces of evidence that make them up. From this point of view the truth or falsity of a statement $c(h, e)=r$ is a consequence of the given definition, and hence an analytic statement. Attractive as this may be for certain purposes, it also displays a weakness. For if someone were to adopt a different definition of confirmation and thereby be led to a contrary belief, how could they be shown to be in error?

3. Argumentation Theory

Argumentation theory aims at an (informal) account not of scientific, but of what is called *common-sense* reasoning. For example, it seeks to explain the empirical fact that on many occasions people are willing to infer 'if q then p' from 'if p then q,' or reluctant to conclude 'if not-q then not-p' from 'if p then q.' Generally, the occurrence of inferences like these, which are anomalous from the point of view of deductive inference, is accounted for pragmatically, often by calling on Gricean conversational implicatures (see *Conversational Maxims*).

The most recent developments with regard to inference have been stimulated by the observation that in commonsense reasoning it is not unusual to withdraw a previously established conclusion on the basis of new information. This kind of reasoning is called *non-monotonic*. Given that Tweety is a bird, for example, one seems to be quite justified in concluding that Tweety can fly. But as soon as it is added that Tweety is also a penguin, that very conclusion—but not the premise that birds fly—has lost its support. To explain examples like this means to account for rules which allow for known exceptions. But most of all it requires an attitude towards inference allowing for the possibility that what at one time is a perfectly warranted conclusion, may be capable of revision in the light of additional evidence.

See also: Validity; Reasoning; Logic: Historical Survey; Entailment.

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Inflection and Derivation

Morphology is customarily divided into inflection and word-formation, and word-formation in turn into derivation and compounding (see *Morphology*). Inflection and derivation are both to do with complex noncompound words (CNCWs for short), that is, words typically consisting

of a base (a root, stem, or word) and an exponent of a morphological category, usually but not always in the shape of an affix (see *Affixation as a Means of Word-formation*). CNCWs in any language show a multitude of properties, and to the extent that such properties are logically independent of one another, CNCWs can thus be divided into a vast number of potential subgroups on the basis of these properties. It is therefore an empirical question whether the diversity of subclasses of morphological categories actually encountered in a language can be reduced to some order. One very orderly state of affairs would be the existence of just two classes, founded on two complementary sets of relevant properties, permitting the generalization that if any morphological category has one property it will have all others of the relevant set and none from the complementary set. Labeling the two subclasses 'inflectional' and 'derivational' can then be considered shorthand for such generalizations about interdependent properties. Another fairly orderly pattern would be one involving one-way rather than mutual implications among individual distinctive properties. This would allow morphological categories to be ordered along a one-dimensional continuum (reflecting the fundamental distinction between composite syntactic expressions and basic lexical building blocks). This view of a more or less continuous gradation between kinds of morphological categories, possibly punctuated differently in different languages, appears to be more realistic than that taking the neat dichotomy of inflectional and derivational morphology for granted or that reckoning with chaotic diversity.

1. Elementary Distinctions

What follows is a survey of some two dozen criteria for the subclassification of morphological categories as expressed in CNCWs. Criteria such as these underlie the separation of inflection and derivation in descriptive grammars and are often discussed in general treatments of this issue, a selection of which is given in the bibliography at the end of this article. The pattern of diversity that may emerge from such a battery of elementary distinctions will be illustrated by comparing in some detail several morphological categories, or terms realizing them, of English: 3rd person singular subject agreement (present indicative) of verbs, plural of nouns, inchoative–causative of verbs (especially in *-en*), process–result of nouns (in particular in *-ion/-tion/-ation/-ition/-ution*), state–position of adjectives or adverbs (in *a-*), and a kind of diminution as expressed in nouns in *-ling*. In each case the criteria for classification will be presented so that the criterion represents (a) a more inflectional aspect, and (b) a more derivational one.

1.1 Concepts, Meanings, and Obligatoriness

The CNCWs expressing the morphological category denote (a) the same concepts as their bases or (b) different concepts of their own. (1)

The CNCWs expressing the morphological category and their bases represent (a) different forms of the same lexeme or (b) different lexemes. (2)

Whether formulated in loose semantic (1) or more technical (2) terms, the idea here is that inflection is syntactic, providing the morphological forms which a word (or, more accurately, lexeme—see *Morphological Units*) takes in different contexts, while derivation is lexical, enabling the vocabulary to be enriched by new words (or lexemes). This distinction seems often straightforward: thus, *sing-s* and *sing* are, almost self-evidently, two forms of the same verb, *shrub-s* and *shrub* of the same noun, while *black-en* and *black*, *a-blaze* and *blaze*, *duck-ling* and *duck* are two different words each, at least to judge from dictionaries, which list both items of each pair. Sometimes, though, it appears to be more problematic; thus, *destruction*, usually listed in dictionaries, might be a word in its own right, separate from the verb *destroy*, or, like gerunds, a mere form of that verb, required in certain syntactic contexts. In fact, this distinction is always language-specific, never an exclusively semantic or conceptual matter. It is not easy to argue on semantic and language-independent grounds that collectives such as *shrubb-ery*, for instance, represent separate concepts from their bases while plurals such as *shrub-s* do not.

The meaning of the morphological category is relatively (a) abstract or (b) concrete. (3)

In comparison with the meanings typically expressed by the basic lexical stock of a language, in particular by noncomplex nouns, verbs, and adjectives, morphological categories all tend towards abstractness. Differentiating degrees of abstractness is straightforward if two morphological categories have a common semantic denominator, to which one of the categories adds further meaning components. Thus, plural (*shrub-s*) is less concrete than the largely synonymous collective *shrubb-ery*, since *shrub-s* lacks the semantic requirement that the set of referents form some kind of unity. Otherwise it is largely on intuitive grounds that some categories are judged to be more abstract than others. In this small sample, verbal agreement is indubitably the most abstract category (there are no independent words to express any such notion); less abstract are plural, inchoative–causative ((cause to) become), process or result (as expressed by nouns in *-ion*), and 'being in a state or position' (the meaning of adjectives such as *a-blaze*); the relatively most concrete notion is probably diminutive.

The specification of the morphological category is grammatically (a) obligatory or (b) nonobligatory for CNCWs of the relevant word–class. (4)

In English, (finite) verbs, in the present tense, must be specified for person (3rd vs. others) and number (singular vs. plural) of their subject, and nouns for number (singular vs. plural), even if such detail is of no particular communicative relevance. By contrast, the grammar of English does not require that any of the other categories under discussion should be specified.

1.2 Categorial Infrastructure

The morphological category (a) forms a more or less closed system, being alternatively realized by a limited number of terms, or (b) is not part of any well-organized categorial system. (5)

Typical instances of well-organized systems in paradigms

(see *Paradigms*), with categories being realized by a relatively small set of terms, are person–number of (finite) verbs and number of nouns in languages such as Latin. All terms (1st, 2nd, 3rd; singular, plural) can here be seen as the alternative realizations of their categories (person; number); and, even though it may be possible to assign some special status, 'unmarkedness,' to one term of such sets (the 3rd person singular of finite verbs, and the singular of most nouns), no term has only and always zero exponence. At first glance, person–number agreement of verbs and number of nouns appear to be categories with analogous infrastructures in English and Latin. However, there is a formal difference of some possible significance: the contrasting category happens to have zero as its exponent everywhere, so that there might be one basic form and one morphologically complex form rather than a well-organized system. In such circumstances, what is at best assumed to form a system is the set of all morphological categories expressible in complex forms sharing a base, but those systems can hardly be said to be as well-organized and well-delimited as those where categories are realized by a set of structurally equivalent terms.

1.3 Word-external Syntagmatic Relationships

The function of the morphological category is (a) of a relational or (b) of a nonrelational (or material) kind. (6)

Morphological categories are relational if they serve to relate syntactic constituents to one another or to relate the propositional content of sentences to the speech act. Verbal 3rd person singular is the only clearly relational category in English, linking finite verbs to subjects by virtue of agreement. Insofar as this agreement marker also expresses tense, it is relational in the second sense as well, specifying the temporal relation between the proposition and the speech act. The plural of the nouns, while clearly nonrelational in itself, plays a role in the signaling of syntactic relatedness insofar as (3rd person) finite verbs are responsive to number distinctions of subjects.

The following four distinctions (7–10) spell out in more detail what the relationality of categories may consist in.

CNCWs (a) agree or (b) do not agree with other syntactic elements with regard to the morphological category they express. (7)

Verbal 3rd person singular is the only category in the sample which is agreement-determined in a straightforward sense. Insofar as body-part nouns (and certain others) must be plural if they occur with plural subject noun phrases whose referents own one such body part (or similar possession) each, as in *The dogs were wagging their tails/tail*, nominal number might also be assumed to be agreement-determined in such constructions.

(a) There are or (b) there are not syntactic elements which agree with CNCWs with regard to the morphological category expressed. (8)

The only agreement-determining category in English is nominal plural.

The morphological category (a) is or (b) is not assigned to CNCWs by syntactic government, that is, is or is not determined by classes of lexemes the CNCW is in construction with. (9)

None of the categories in the sample is syntactically governed in a narrow sense. Insofar as 3rd person singular agreement is absent in certain subordinate clauses, such as *It is essential that the dog wag its tail*, depending on, or 'governed' by, main-clause verbs, the assignment of this category might be said to involve government. That certain verbs require their subject or direct object nouns to be in the plural (e.g., *They massacred the inhabitants*) suggests that nominal number might at least marginally also be governed.

CNCWs (a) cannot or (b) can be replaced in (virtually) all their syntactic contexts by morphologically simpler words lacking the relevant category. (10)

Verbal 3rd person singular shows a very low degree of syntactic commutability, being replaceable by basic verbs only in certain subordinate clauses and in jussive main clauses (such as *It is essential that he come-s/come*, *God save-s/save the Queen*). Plural nouns generally cannot be replaced by basic nouns when they occupy the subject relation with verb phrases marked for plural or whenever they are accompanied by plural determiners, unless the replacing noun is *people* or a few others which are notionally plural or collective. The CNCWs expressing all the other categories are freely commutable for correspondingly simpler words in virtually all syntactic contexts.

1.4 Word-internal Syntagmatic Relationships

The exponents of the morphological category are closer (a) to the margin of CNCWs or (b) to their stem or root, relative to other categories. (11)

Third person singular endings close verbal words: no further morphological exponents may come after them (except perhaps, in the case of auxiliaries, reduced negative *n't*, if this counts as a suffix rather than as an enclitic), while all kinds of categories, including inchoative–causative (*black-en-s*), may be expressed in less peripheral a position. Likewise, plural is closer to the end of nouns than the exponents of most other categories, including process–result (*destruct-ion-s*) and diminutive (*duck-ling-s*). The plural marker may be followed, though, by second constituents of certain kinds of compounds or similar complex units (e.g., *passer-s-by*, *son-s-in-law*), and if the plural is irregular, by the genitive (*ox-en-s*), whose morphological credentials, however, are dubious (with genitive *'s* behaving in several respects like an enclitic). Unlike 3rd person singular, plural may, with a few nouns, find its sole expression in the stem itself rather than in an affix (*tooth–teeth*, etc.), and this is as close to the base as an exponent may ever get. No further prefixes seem ever to intervene between statal–positional *a-* and its stem, while it may occasionally be preceded by a prefix, either directly (*semi-a-sleep*) or upon the transformation of an *a-* adjective into a verb (*re-a-wake-n*).

There is (a) no or (b) some allomorphy of bases conditioned by the morphological category. (12)

Bases are unaffected by inchoative–causative *-en* (unless the elision of the dental consonant in base-final clusters (st, ft/, as in *fast-en* and *soft-en*, is to be attributed to this morphological category as such), statal–positional *a-*, and diminutive *-ling*. Most Latinate verbal bases of processual–resultative nouns in *-ion* are subject to allomorphy (*destroy–*

destruct-ion, *collide–collis-ion*, etc.). Many nominal bases ending in /f/ and some ending in /θ, s/ undergo final voicing upon pluralization (*wife–wive-s*, *mouth–mouth-s*, *house–house-s*); *penny* may drop its final vowel when pluralized, giving irregular *pence*; a very few nonnative nouns modify the final part of the stem when retaining their original mode of pluralization (e.g., *index–indic-es*); and there also are some nouns (such as *tooth–teeth*) where stem allomorphy is the only exponent of plural. Third person singular does not cause allomorphic changes of verbal bases, except with three verbs which are irregular also in other respects (*be*, *have*, *do*).

If the morphological category conditions allomorphy of the base, this allomorphy is relatively (a) regular or (b) idiosyncratic. (13)

There are several factors involved here. One is the formal relationship between allomorphs. Disregarding instances where stem allomorphy is the sole exponent of plural (*tooth–teeth*) as well as nonnative plural stems as in *indic-es* and the peculiar case of *pence*, the stem allomorphies which are conditioned by a plural affix are very uniform, consisting exclusively in the voicing of the final fricatives /f, θ, s/. Despite several recurring patterns, such as the spirantization plus palatalization of final /d, t/ (*invas-ion*, *admiss-ion*, etc.) or the change of the verbalizing suffix *-ify* to *-ific-* (*falsific-ation*), the allomorphies conditioned by nominalization in *-ion* are far more diverse, varying virtually from one basic Latinate morpheme to the other (*destroy–destruct-ion*, *repel–repuls-ion*, *conjoin–conjunct-ion*, *move–mot-ion*, etc.). Second is the pervasiveness of such allomorphies with bases in principle able to show them. Where the plural is concerned, many nouns ending in /f, θ/ do not undergo final voicing (*chief-s*, *smith-s*, etc.), or do not undergo it obligatorily (e.g., *hoof–hoove-s* /f, v/, *truth-s* /θ, ð/), and of those in /s/ *house* is in fact the only one with a voiced final in the plural. By contrast, nominalization in *-ion* obligatorily requires the relevant allomorphs from all (Latinate) bases which have any. Third, allomorphies may be unique to individual conditioning categories, or may occur in other contexts as well. While not unique to pluralization, final voicing is only sporadically conditioned by other morphological categories, including affixless verbalization (*to wive*, *to mouth*, *to house* /v, ð, z/) and adjectivalization in *-ish* (*thiev-ish*), and does not apply across the board here, either (*to knife*, *to tooth*, *to goose*; *wif-ish*, *goos-ish*—all with /f, θ, s/). Allomorphies conditioned by nominalization in *-ion* are a little more general, recurring with several other categories (viz., most of those whose exponents are Latinate suffixes: *destruct-ive/-ible*), though by no means with all (*destroy-er/-able/-ing/-s/-ed*, disregarding the possible back-formation *to destruct*). On balance, the allomorphies conditioned by plural and nominalization in *-ion* are both neither maximally regular nor utterly idiosyncratic; perhaps those associated with plural appear slightly more regular by virtue of their greater uniformity. The stem allomorphs of *do*, *have*, and *be* required by 3rd person singular (present indicative)—/dʌ/ (as in *does*), and, provided such stems can indeed be isolated, /(h)ə, hæ/ (*has*) and /(ə), ɪ/ (*is*)—are truly idiosyncratic.

The choice among alternative exponents of the category, if there is any, is regulated relatively (a) tightly or (b) loosely. (14)

The distribution of the three allomorphs of 3rd person singular present indicative, /-ɪz, -z, -s/, is strictly determined by the final sound segment of verbal bases in terms of sibilance and voice; assuming, implausibly, that the modals are a subclass of verbs, zero would have to be recognized as a further 3rd person singular allomorph, peculiar to all items of that morphosyntactic class. Plural allomorphs of nouns are much more numerous, and the principles of their selection are fairly diverse. There are the three variants of the most general plural ending, /-ɪz, -z, -s/, which are phonologically distributed. Other suffixes marking plurality may be lexically determined (*ox-en*), morphologically determined (*series*), morphosyntactically and phonologically determined (*Swiss-∅*—assuming this to be a noun), or determined on a semantic–pragmatic basis (*partridge-∅*, with such zero plurals, in hunting parlance, often used to refer collectively to the bag). Some nouns admit the general /-ɪz, -z, -s/ plural as an alternative (*brethr-en/brother-s*, *cactus-es*, *partridg-es*). With all the other categories there is more than one way to mark the category (and despite some regularities, it is not predictable which one will be chosen), and in some cases the particular marker can also serve other functions. There is hardly a well-integrated series of options.

The morphological category (a) may not or (b) may be expressed by synonymous words, especially synonymous CNCWs with the same base. (15)

Since the three phonologically conditioned allomorphs of 3rd person singular verb agreement, /-ɪz, -z, -s/, are in complementary distribution, there can never be more than one CNCW for that category for any base. For plural, on the other hand, bases do not always exclude alternative exponents; coexisting plural nouns, however, tend not to be entirely equivalent: cf. *brethr-en* (with the range of meanings of the base narrowed down to 'fellow male member of a religious community')—*brother-s*, *partridge* (suggesting that the animal is to be conceived of as game)—*partridg-es*. For all other categories bases likewise admit alternative exponents. There is, however, generally greater toleration of synonymous or near-synonymous CNCWs with the same bases for these categories than in the case of the plural (e.g., *admiss-ion/admitt-ance*, *a-dangle/dangl-ing*, *kitchen-ette/mini-kitchen*), notwithstanding occasional, often ad hoc semantic differentiations or inhibitions to produce novel CNCWs with the same meaning as well-established words (thus, the existence of the process–result noun *arriv-al* might be held responsible for preventing the formation of **arriv-ation* (see *Blocking*)).

Homonyms (a) do not or (b) may prevent the formation of CNCWs of the morphological category. (16)

It is certainly irrelevant for the formation of 3rd person singular present indicative verbs and plural nouns whether there happens to exist a homonymous word; thus, *know-s* happily coexists with *nose*, and *day-s* with *daze* and genitive singular *day's*. With the other categories homonymy may conceivably be a factor sometimes contributing to the avoidance of CNCWs, although convincing examples are rare; cf. ?*rat-ling* 'young rat' (perhaps partly because of *-ing* forms of the verb *rattle*), **a-mount* (because of the

noun and verb *amount*), **a-go* (because of the postposition *ago*), **a-rest* (because of *arrest*).

The morphological category (a) is or (b) is not expressed cumulatively with another morphological category. (17)

In a verb form such as *sing-s* the morphologically unsegmentable ending simultaneously provides information about four categories: person and number of the subject, and mood and tense. While the plural is evidently expressed separately from the genitive in irregular-plural nouns (*ox-en-s* stem-pl-gen, *mice-s* stem-pl-gen), these two terms of number and case do not have separate overt exponents in regular nouns. In the regular cases it is not obvious what is the best analysis, though cumulation is one option. None of the other categories involves cumulation.

1.5 Relationships between Base and Complex Word

The semantic contribution of the morphological category is (a) uniform for all bases or (b) diverse. (18)

Adding /-ɪz, -z, -s/ to a basic verb invariably signals that it is present indicative and its subject is 3rd person singular. Plural marking, however, has different semantic effects depending on whether it is added to count nouns, in which case their plurals refer to more than one individual, or to mass nouns, in which case their plurals refer to more than one countable unit of those masses (e.g., *beer-s* 'more than one sorts/glasses of beer'). Above, *-ling* has been called a kind of diminutive suffix, but it is obvious that its semantic effects vary with the meanings of its bases; compare *duck-ling* 'young duck' (unlikely to be used of small old ducks) and *squire-ling* 'petty squire' (depreciative rather than neutrally diminutive). Depending on the meanings of their bases, adjectives with prefix *a-* vary between statal (*a-blaze*) and positional readings (*a-shore*), but this distinction is not always especially clear-cut (cf. *a-horseback*, denoting a position as well as a state). Deadjectival verbs in *-en*, referring to the attainment of the state denoted by the basic adjective (or the adjective associated with the basic noun, cf. *strength-en*), may be inchoative or causative, but these two meanings, correlating with the intransitive or transitive use of verbs, are in principle possible for all bases alike, although causative/transitive uses are more frequent. Nouns in *-ion*, etc., may refer to both processes and their results, but this ambiguity is likewise present with all possible bases.

The semantic relationship between CNCWs and their bases is (a) transparent for all occurrences of the morphological category or (b) at least occasionally opaque. (19)

Whenever CNCWs have joined the more or less permanent lexical stock of a language, they may undergo semantic developments not shared by their bases, whose meanings in turn may also shift without those of the corresponding CNCWs following suit. The distinction at issue here is, thus, ultimately one resulting from the resistance or proneness of CNCWs to lexicalization (see *Lexicalization and Institutionalization*), which is the precondition for subsequent autonomous developments. There are no such semantic dissociations between 3rd person singular present indicative verbs and their bases. On the other hand, there are quite a few plurals differing from nouns which are formally their singulars in a semantically idiosyncratic manner, including *air-s* 'unnatural manner or action intended to impress' (which is not a meaning drawn from the range of meanings expressed by *air*), *damage-s* 'money claimed from a person for causing damage,' *work-s* 'moving parts of a machine.' Similar semantic idiosyncrasies are also found with all the other categories, least frequently perhaps with inchoatives–causatives and diminutives: cf. examples such as *black-en*, whose meaning 'to cast a slur on someone's name or character' is not transparently derivable from any of the meanings of the adjective *black*; *profess-ion* 'occupation requiring advanced education and special training, body of people in such an occupation,' *relat-ion* 'relative'; *a-way* 'to or at a distance, continuously completive aspect,' *a-live(to)* 'aware of'; *cigar-ette* (not a small cigar), *star-let* 'young actress hoping to become a star' (*star* being gender-neutral).

The applicability of the morphological category to bases of particular word-classes is (a) unlimited or (b) limited in one way or another. (20)

Any English verb, regardless of its form and meaning and even if newly coined on the spur of the moment, can be put in the 3rd person singular present indicative; moreover, such complex forms will not strike anyone as more unfamiliar than their bases. All the other categories are less productive (see *Productivity*) insofar as (a) bases of the relevant kind do not include all words of the respective word-classes but only semantic subsets of them, (b) particular phonological and morphological factors tend to discourage, or encourage, the formation of CNCWs, or (c) novel CNCWs, even if formed from bases of the relevant kind and not discouraged by any phonological or morphological factors, will simply be found so unfamiliar as to attract notice (in other words, there is no longer, or not yet, any synthetic rule for forming words of such categories). Plural is least subject to productivity limitations. Only countable nouns are pluralizable; but since uncountable nouns can often be used to refer to countable units (e.g., *several excellent beers*, *the new Englishes*), the scope of pluralization increases considerably. Nevertheless, there still are many nouns, mostly abstract or collective ones, which resist pluralization or sound or look unfamiliar if pluralized (e.g., *knowledge*, *luck*, *help*, *information*, *thunder*, *produce*, *macaroni*, *chaos*).

There are (a) no or (b) some CNCWs expressing the morphological category whose base is only attested in those CNCWs themselves. (21)

For every 3rd person singular present indicative verb there is a basic verb occurring independently or in other CNCWs. This does not hold for any of the other categories. There are many plural nouns, recognizable as plurals by their own form as well as on the evidence of agreement, without a corresponding singular noun and often without the basic noun occurring in another morphological combination (*odd-s*, *amend-s*, *belonging-s*, *outskirt-s*, *particular-s*, *antipode-s*, etc.); similarly for inchoative–causative verbs (*happ-en*, *hast-en*), process–result nouns (*vis-ion*, *contag-ion*, *ambit-ion*), state-position adjectives (*abroad*, *aware*, *agog*, provided they are recognized as CNCWs with prefix *a-* in the first place), and diminutive nouns (*fledg(e)-ling*, *ham-let*).

The word-class of the base (a) cannot or (b) may be altered by the morphological category. (22)

Verbal bases remain verbs when specified for person and

number subject agreement. Nominal bases remain nouns when specified for number. The bases of inchoative–causative verbs, on the other hand, are adjectival and rarely also nominal (*strength-en*) but never verbal, and those of processual–resultative nouns are verbal but never nominal. Statal–positional adjectives (or adverbs) have nominal (*a-fire*) or intransitive-verbal (*a-float*) bases (with the word class of the base being often indeterminate, cf., *a-swoon*), and thus are also instances of (b), regardless of the fact that their word-class remains constant when formed, more rarely, from adjectival bases (*a-loud*). The bases of *-ling* diminutives may be nominal (*duck-ling*), adjectival (*young-ling*), verbal (*suck-ling*), or prepositional (*under-ling*).

The morphological category (a) is or (b) is not limited to bases of a single word-class. (23)

Only verbs may be turned into the 3rd person singular present indicative verbs. Only nouns may be turned into plural nouns (and plural also applies to personal and demonstrative pronouns). Only adjectives may normally be turned into inchoative–causative verbs by *-en*, but there are a very few isolated denominal exceptions such as *strength-en* or *fright-en*. Only verbs may be turned into processual–resultative nouns by *-ion* or its variants, even though verbal bases of many *-ion* nouns (such as *caution* or *contagion*) do not exist in English or have only been created by back-formation (e.g., *to televise*). The bases of statal–positional adjectives (or adverbs) in *a-* are mostly nominal but may also be adjectival; the bases of *-ling* diminutives may be nominal, adjectival, verbal, or prepositional.

The word-class of CNCWs (a) is or (b) is not uniquely determined by the morphological category. (24)

All words in the 3rd person singular present indicative are verbs; all words in the plural are nouns (or personal or demonstrative pronouns); all words with inchoative–causative *-en* are verbs; all words with processual–resultative *-ion* or its variants are nouns (some of which, e.g., *commission* or *position*, may secondarily be used as verbs); all words with statal–positional *a-* are adjectives (or adverbs, but this word-class distinction is dubious); all words with diminutive *-ling* are nouns. Adjectival negation would be an example of a category not uniquely determining the word class of CNCWs: most negative prefixes form adjectives as well as words of other classes, especially nouns (*in-discipline*, *un-person*, *dis-order*, *non-smoker*) and more rarely also verbs (*dis-approve*).

The morphological category (a) cannot or (b) may be assigned more than once to the same base. (25)

Adjectival negation is an example of a morphological category that may be reiterated (*non-un-natural*, *non-ab-normal*, or *un-dis-similar*), although it is certainly more common for the repeated negation to be expressed syntactically; others are prefixes such as *re-*, *anti-*, or *vice-*: *re-re-read*, *anti-anti-matter*, *vice-vice-chancellor*. Repeated occurrences of a category in a single CNCW with other categories intervening are a different matter. This possibility is found in particular with processual–resultative *-ion* and its variants (e.g., once *revol-ution* has been successively turned into an adjective and a verb, it may again be nominalized by *-ation*: *revolutionalization*).

1.6 Shape of Exponents

The positioning and the segmental, suprasegmental, syllabic, and morphemic structure of the exponents of the morphological category are (a) relatively similar to or (b) dissimilar from that of exponents of categories with otherwise similar properties. (26)

Verbal 3rd person singular agreement and nominal number, two categories sharing most of the properties taken into account here, are very similar to one another insofar as (a) their exponents, if affixial, are exclusively suffixes; (b) an identical set of suffixial allomorphs, /-ɪz, -z, -s/, is utilized, with one further native suffix peculiar to number, viz. *-en*, resembling the first of these regular allomorphs in that it consists of a mid central vowel followed by an alveolar consonant; (c) their suffixal exponents neither carry stress nor alter the stress pattern of bases; (d) their suffixal exponents are either nonsyllabic or monosyllabic. Inchoative–causative, process–result, state–position, and diminutive differ from this pair of categories on many counts and share many properties among themselves. There is, however, much greater diversity in this second group along all four of the dimensions outlined above.

Exponents of the morphological category (a) do not or (b) do resemble genuinely free morphemes in internal structure. (27)

Considered in isolation, some exponents of 3rd person singular agreement, plural, and state–position could pass for free morphemes in their internal makeup, if only rather special ones tending to be prosodically bound to neighboring words, such as the 3rd person singular indicative present form of *to be*, the 3rd person singular masculine possessive pronoun *his* (both realizable as /ɪz/), and the indefinite article (/ə, ən/). Some of the exponents of other categories, too, would not qualify as free morphemes (e.g., *-th*) or only resemble prosodically bound ones (e.g., inchoative–causative *-en/en-*); some, however, look like genuine words (e.g., *-ize*, *-(i)fy*; *-(at)ion*; *-ling*, *mini-*). From a diachronic perspective this contrast is often one between morphological exponents which do not, or do not transparently, derive from free morphemes and ones which do.

1.7 Cross-linguistic Variation

The morphological category recurs (a) frequently or (b) not so frequently in other languages with CNCWs. (28)

In the absence of extensive and reliable surveys of morphological categories across the languages of the world, it is only a guess to say that the cross-linguistic frequency of all the categories in English, with the exception of adjectival state–position, is relatively high. If languages have morphologically expressed categories at all, virtually all those which have here been exemplified from English seem likely to be among them—certainly there are others, such as 'tree producing the fruit denoted by the base' (cf. French *pomm-ier* 'apple tree') or 'infection or other disease of the organ denoted by the base' (as in *tonsil-itis*), which would be encountered far more sporadically (see *Morphological Universals*; *Semantic Categories*: *Morphological Encoding*).

2. Patterns Emerging from Elementary Distinctions

This survey of elementary distinctions between six morphological categories of English is summarized in Table 1. Insofar as many of these distinctions are gradual rather than categorical, as should have become plain, it is an oversimplification to provide only two values, *a* and *b*. In a way, the insufficiency of binary values is reflected, in this tabular summary, by the frequency of question marks, which indicate primarily that the assignment of the value given is problematic, for one reason or other (to do either with the distinction or with the available evidence and its analysis), but which may also be interpreted as providing intermediate values between the two opposite extremes.

Table 1: Some morphological categories of English and their properties

Distinctions	3sg	Pl	Inch	Proc	Stat	Dim
	a	*b*?	*b*	*b*	*b*	*b*
17	*a*	*b*?	*b*	*b*?	*b*	*b*
20	*a*	*b*	*b*?	*b*	*b*	*b*?
19	*a*	*b*	*b*?	*b*	*b*	*b*?
21	(*b*)	*a*	*b*	*b*	*b*	*b*
8	*a*?	*a*?	*b*	*b*	*b*	*b*
5	*a*?	*a*?	*b*	*b*	*b*	*b*
9	*a*	*a*?	*b*	*b*	*b*	*b*
6	*a*	*a*?	*b*	*b*	*b*	*b*
7	*a*	*a*?	*b*	*b*	*b*	*b*
14	*a*	*a*	*b*	*b*	*b*	*b*
4	*a*	*a*	*b*	*b*	*b*	*b*
10	*a*	*a*	*b*	*b*	*b*	*b*
15	*a*	*a*	*b*	*b*	*b*	*b*
22	*a*	*a*	*b*	*b*	*b*	*b*
26	*a*	*a*	*b*?	*b*	*b*	*b*
1	*a*	*a*?	*b*	*b*?	*b*	*b*
2	*a*	*a*?	*b*	*b*?	*b*	*b*
11	*a*	*a*?	*b*	*b*	*b*?	*b*
16	*a*	*a*	*b*?	*b*?	*b*	*b*?
13	(*b*)	*a*?	–	*b*?	–	–
27	*a*	*a*	*b*	*b*	*a*	*b*
12	(*b*?)	(*b*?)	*a*?	*b*	*b*	(*a*)
18	*a*	(*b*)	*a*	*a*	*b*?	*b*
23	*a*	*a*	*a*?	*a*	*b*	*b*
3	*a*	*a*?	*a*?	*a*?	*a*?	*b*?
28	*a*	*a*	*a*	*a*	*b*	*a*
24	*a*	*a*	*a*	*a*	*a*	*a*
25	*a*	*a*	*a*	*a*	*a*	*a*
Total of *a*(?)s:	25	22	7	6	4	4
Total of *b*(?)s:	3	6	20	22	23	23

Notes to Table 1

Categories:

3sg	3rd person singular present indicative
Pl	plural
Inch	inchoative–causative
Proc	process–result
Stat	state–position
Dim	diminutive

Distinctions:
Numbering corresponds to that given in Sect. 1.
Value '–' indicates that the distinction is inapplicable.
Further explanation is given in the main text.

Although no two categories have exactly the same set of properties, 3rd person singular (present indicative) verb agreement and nominal number on the one hand and the four other categories on the other are sufficiently similar, and each member of the one group is sufficiently dissimilar from each member of the other, to warrant the setting up of two classes of categories expressed in CNCWs. The labels 'inflection' and 'derivation' give terminological recognition to such binary subclassifications, whose substance, however, lies in the clear predominance of *a* or *b* properties as listed in Sect. 1. It is conceivable for further morphological categories to strike a balance between *a* and *b* properties, and thus to constitute a third class intermediate between those labeled inflection and derivation. Yet another possibility is the existence of categories where the predominance of either type of property is not sufficiently marked to permit any discrete divisions into classes, suggesting instead an ordering of categories in a continuum, of the kind shown for the derivational group in Table 1. While the six categories examined above appear to be fairly representative of the extent of diversity to be encountered in English, the CNCWs of other languages may well show more variety or also less.

The taxonomy of categories now needs to be complemented, more importantly, by a taxonomy of distinctive properties. The thematic grouping of elementary distinctions in Sect. 1, natural though it would seem, is less than optimal as far as interrelations between individual distinctions are concerned. In fact, to the extent that distinctions are logically independent of one another (and most of those utilized are), the existence of systematic interrelations cannot be taken for granted. A priori, it would be perfectly possible for an English morphological category to have, say, 7 *a*(?) and 20 *b*(?) properties, and thus to be exactly on a par with inchoative–causative, but to amass these totals in an entirely different manner. However, what Table 1 suggests, and what would need to be confirmed by a more exhaustive survey of categories, is that empirically there actually is a great deal of interdependency. To show this more clearly, distinctions have been rearranged in accordance with the ratios of their values, with those richest in *b*(?)s at the top and with the number of *a*(?)s steadily increasing as we move down the lines of the table.

On the basis of the six categories examined, it may tentatively be concluded that there are some mutual implications between categories. Overall, the general rule is for the value *a*(?) at any position in the column of distinctions as arranged in Table 1 to imply an *a*(?) at the next position down (but not vice versa), and for the value *b*(?) at any position to imply a *b*(?) at the next position up (but again not vice versa).

From this point of view some of the cells in Table 1 are not well-behaved, even though the arrangements of categories and distinctions have been designed to minimize such unruliness. While for most of the categories the transition from one value to the other is abrupt, with 3rd person singular verb agreement opting for value *a* from the very top, state–position shows a transition zone comprising some six distinctions, where values change more than once. Further, for most of the categories with a point rather than a zone of transition there are a few unpredicted values (circled in Table 1), which are once near and sometimes disappointingly far from the horizontal transitions. Unless such cases are accounted for by smaller-scale regularities, they have to be recognized as idiosyncratic properties of the categories concerned, requiring separate specification. If a distinction shows unpredicted values for several categories, as No. 12 (base allomorphy) does in a small way,

this raises doubts about its being systematically interrelated with the others in the first place.

The primary object of empirical study is, thus, the systematic interdependence between elementary distinctions like those surveyed in Sect. 1; it is these which determine the division of morphological categories as expressed in CNCWs into subclasses, discrete or otherwise, such as those commonly labeled 'inflection' and 'derivation.'

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F. Plank

Information Structure

Information structure is the encoding of the relative salience of the constituents of a clause, especially nominals, and is realized as choices among alternative syntactic arrangements. The information structure of a particular clause is determined by the larger sentence or discourse of which it is a part (i.e., its context). The communicative effect of the information structure is to foreground certain aspects of the message of the clause, but to background others. The need to encode information structure is a language universal, but the formal means to do so vary widely across the languages of the world.

1. Definition of the Basic Terms: Focus and Topic

English is often referred to as a fixed-order language. This is because changing the word order typically alters the basic meaning of the sentence: for example, *John killed Bill* has quite a different meaning from *Bill killed John*; Russian, on the other hand, is commonly called a free word order language. For example, the sentence *Maksím zaščiščájet Víktora* has the following alternative orders, all of the same meaning (Comrie 1979a):

Maksím Víktora zaščiščájet (1)

Víktora Maksím zaščiščájet (2)

Víktora zaščiščájet Maksím (3)

zaščiščájet Maksím Víktora (4)

zaščiščájet Víktora Maksím (5)

'Maksím defends Viktor.' (6)

In all these sentences *Maksím* is nominative case, indicating it is the subject, while *Víktora* is accusative case, for the direct object. Thus, the word order of Russian can vary freely without changing the basic meaning of which nominal is subject or object. To make that change the case endings must be transposed: *Maksíma zaščiščájet Víktor* 'Viktor defends Maksim.'

But it is not truly accurate to claim that the word order of Russian is absolutely free. Word order is used by Russian, as well as many other languages, to encode the information structure of the clauses. Each of the above alternatives (1–6) expresses the same meaning, but encodes it within different information structures; this is made clear by a study of the following mini-dialogues (Comrie 1979a):

Q: Któ zaščiščájet Víktora? (7)
'Who defends Viktor?' (8)

A: Víktora zaščiščájet Maksím. (9)
'Maksim defends Viktor.' (10)

Q: Kogó zaščiščájet Maksím? (11)
'Whom does Maksim defend?' (12)

A: Maksím zaščiščájet Víktora. (13)
'Maksim defends Viktor.' (14)

Note that while the answer to both questions can have the same word order in English, this is not possible in Russian. Rather the nominal which provides the answer to the question word always occurs finally in the answer, while the material already established by the question must precede it. The question sets up certain expectations which must be realized in the information structure of the answer. The nominal corresponding to the question word is the *focus* of the clause, expressing the new information which the utterance of the clause is expected to provide, while the remainder expresses what is taken for granted (presupposed). Thus the information structure of both question and answer in the first mini-dialogue could be represented as:

Q: Presupposed: someone is defending Viktor (15)
Focus: who is that someone? (16)

A: Presupposed: someone is defending Viktor (17)
Focus: that someone is Maksim. (18)

With the exception of question words which always occur initially, Russian has a fairly rigid rule of information structure that presupposed information precedes focused information. Focused information typically occurs at the end of the sentence:

Presupposed: someone is defending Viktor (19)
Focus: that someone is Maksim. (20)

Víktora zaščiščájet || Maksím. (21)
PRESUPPOSED || FOCUS

The above sentence (21) presents an obvious question as to the information status of the first noun, *Víktora*. This corresponds to the *topic* of the sentence, another notion of information structure best illustrated by mini-dialogues (Comrie 1979a):