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Theoretical foundation for word classes

Christian Lehmann

Abstract

The word is a significative unit of a language system. Criteria for the classification of words are rooted both in functions of cognition and communication and in structural constraints. The relevant operations of cognition and communication are reference, predication and modification. Alternatives to word classification include the classification of roots, stems and phrases. A higher-level operation is eased to the extent that the ingredient lower-level units are categorized. Word classes are prior categorizations preparing or incorporating propositional operations. While major word classes are founded in universal propositional operations and therefore relatively similar across languages, minor word classes are specified inside a language system with respect to major ones and increasingly subject to language-specific structural constraints.

Keywords: word class, classification, propositional operations, reference, predication, modification, prototypical concept, selection vs. combination, relationality, lexeme, word form, categorization, distributional analysis, notional class, categorial meaning, major class, minor class

1 Introduction

The aim of this chapter is to introduce the basic concepts in the realm of word classes and to lay the theoretical and methodological foundations for their classification.¹ The theoretical basis is a theory of human language which takes this to be an activity of cognition and communication which is shaped and systematized by spatio-temporally delimited speech communities. The methodological basis is a hybrid approach to the languages thus formed which combines logical, hermeneutic and empirical methods. Logical, because language is shaped by cognition; hermeneutic, because it is shaped by communication; empirical, because the activity is publicly observable and varies in the speech communities in ways which are amenable to generalization.

2 Basics of classification

The scientist who is confronted with a set of objects in his area wants to classify them by such criteria which show the greatest power of correlation and which thus allow him to control the area. The linguist trusts that the signs of the language under analysis form a semiotic system, so they fall into different categories which can and must be discovered.

¹ The account is largely based on publications by Lehmann listed in the references, especially on Lehmann 2013. References to the sizable literature are found there.

2.1 Properties of classifications

A **class** is a set of elements which share a property. The set of properties shared by the elements of a class is its **intension**. To classify a set of elements means to divide it into subsets which are classes. A general methodological requirement on a classification is that it be complete. A **complete classification** of a set fulfills two conditions: 1) There is no element in the set which belongs to more than one class. 2) Every element of the set is classified, that is, there is no element in the set which would not be an element of one of the classes. Condition 1 requires that the classes of a classification be **mutually exclusive**; condition 2 requires that they be **jointly exhaustive**. A classification of a set which fails to fulfill either of these conditions is incomplete. In this sense, many existent classifications of words are incomplete. A word-class system which counts Spanish *como* ‘how, like’ both as a preposition and as a subordinating conjunction lacks mutual exclusiveness; one which ignores ideophones lacks joint exhaustivity.

A complete classification is achieved by basing it on a principle by which the intensions of the classes differ. In the most straightforward cases, such a principle is a **parameter** whose **values** are the intensions of the classes. If we classify the nouns of a language by their gender, then ‘gender’ is the parameter and concepts like ‘masculine’ and ‘feminine’ are the values. A parameter in this function is a **criterion** of classification.

The values of a parameter of a complete classification are complementary concepts: if one of them applies to an object, all the other values do not apply. If the parameter is binary, its values are **contradictory**. Thus, transitivity may be conceived as binary such that a verb is either transitive or intransitive, and *tertium non datur*. Such a conformation of a criterion guarantees exclusivity of the classes.

A classification may be one-dimensional or multidimensional accordingly as it is based on one or more than one criterion. The classification of the nouns of a language by their gender is one-dimensional. A multidimensional classification is a cross-classification or a hierarchical classification or it is mixed. An early cross-classification of (major) parts of speech is offered by the Roman polyhistor Marcus Terentius Varro (116–27 BC). Table 1 schematizes his text in *De lingua Latina* X, 17 in the form of a two-dimensional matrix. The two binary criteria are a) whether or not the word inflects for tense and b) whether or not the word inflects for case.

Table 1 Varro’s classification of Latin parts of speech

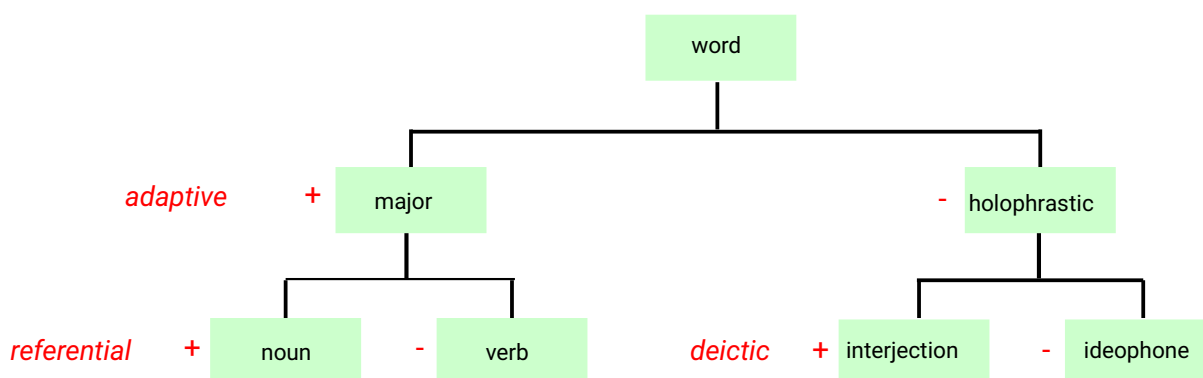
		tense	
		+	-
case \	+	<i>docens</i> ‘teaching’, <i>faciens</i> ‘making’	<i>docilis</i> ‘docile’, <i>facilis</i> ‘easy’
	-	<i>docet</i> ‘teaches’, <i>facit</i> ‘makes’	<i>docte</i> ‘learnedly’, <i>facete</i> ‘wittily’ ²

² *Facete* is not actually related to the other forms based on the root *fac-*.

Varro here uses particular inflected forms as representatives of their class, viz. from left to right: participle, noun,³ verb, adverb.

In a complete cross-classification, each class generated by one criterion also subdivides by the other criteria. To the extent that this fails, a given criterion only applies inside one of the values of another criterion, which reflects a hierarchical relation between them; and to this extent the classification is mixed or, if none of the values cross-classify, purely hierarchical. For instance, the primary subdivision of a system of word-classes may be based on the word's susceptibility to syntagmatic relations – such words are dubbed 'adaptive' in Diagram 1 (Lehmann 2013, § 4.2). The secondary criteria \pm referential and \pm deictic depend on the positive and negative value, resp., of the primary criterion: nouns may refer, verbs not; an interjection is speaker-deictic, an ideophone not.

Diagram 1 Partial hierarchy of word classes



2.2 Prototypical concepts

If a classification is not complete (§ 2.1), its classes may show prototypicality. This presupposes that the intension of the class comprises more than one parameter or at least a gradable parameter. Then some members of a class – its **focal instances** – should possess all of the defining properties, or possess the defining property to the highest degree, while other members fall short of some criteria or occupy a lower degree on the gradable parameter, but are nevertheless considered members of the class. There are also borderline cases of elements which show an almost equal amount of properties constituting neighboring classes; so the classification is not mutually exclusive.

For instance, a participle shares properties of verbs and of adjectives. If it is considered a member of both classes, it is a non-prototypical subclass. Likewise, the prototypical Spanish noun declines for number and has different forms for singular and plural. It follows both the definite and the indefinite article. *Caballo* 'horse' is such a noun and possibly a focal instance of its category. However, abstract nouns such as *sed* 'thirst' and *salud* 'health' only have a singular; nouns designating unique entities like *omnipoderoso* 'almighty' only go with the definite article, and certain titles like *Don* and *Doña*, lit. 'master' and 'mistress', accept no article. These are nevertheless nouns because

³ For the ancient grammarians, adjectives were (common) nouns; cf. ch. 3 of this vol.

they share some syntactic and semantic properties with nouns. The prototypical adjective can be used in attributive and predicative function (E1); but *mero* 'mere' only occurs as attribute (E2).

E1 a. *ridícula vanidad* 'ridiculous vanity'

SPAN b. *su vanidad es ridícula* 'his vanity is ridiculous'

E2 *mera vanidad* 'sheer vanity'

The prototypical verb in French and Italian conjugates for person; but *falloir* and *bisognare* 'be necessary' only have third person. As long as there are other criteria which delimit the class in question without exception, those criteria which do not always apply may simply not be used in the delimitation of the class. Otherwise, it will be a prototypically constituted category.

3 Semiotic system

3.1 Selection and combination

Language activity produces **signs**. These are two-sided entities which associate a perceptible object with a meaning. Speakers (and hearers) **select** units from the inventory and **combine** them into larger units and messages. These two aspects of the activity are not sequential, but simultaneous: Units are not only selected and then combined, but complex units which may or may not have been combined are selected, too.

The signs from which larger units are composed bear relations to each other. In E3, there are relations at several structural levels.

E3 el bosque por encima del pueblo

SPAN 'the wood above the village'

At the highest level, there is a specific semantic relation between the wood and village, coded by the complex preposition *por encima de*. At a lower level, this preposition contracts asymmetric relations to its two dependents, since the syntagma is not synonymous with *el pueblo por encima del bosque* 'the village above the wood'. At a yet lower level, the complex preposition is composed of smaller units, of which *encima* properly codes the specific semantic relation, while *por* and *de* mediate the asymmetric relations to the two relata of the preposition. More generally, the signs composing larger units do not only contribute a separate meaning of their own, but also contract relations to neighboring components.

At the same time, a unit occupying a certain position in a more complex unit is selected from a set of units which might have been selected instead. Thus, instead of *pueblo*, *aldea* 'hamlet' could be chosen, and instead of *encima*, *debajo* 'below' could be chosen.

The static counterpart of the operations of combination and selection are two kinds of relations between linguistic units. Units combined into a larger unit bear a

syntagmatic relation to each other. In *encima del pueblo, el pueblo* bears the syntagmatic relation of complement to the simple preposition *de*. Units selected from a set of units which might have been selected bear a **paradigmatic relation** to the latter. In *encima del pueblo, el pueblo* bears the paradigmatic relation of hyperonym to *la aldea*, while *encima* is in contrast with *debajo*.

A set of signs linked by paradigmatic relations forms a **class**. A set of signs linked by syntagmatic relations forms a **construction**. Speakers form classes of signs by operations of selection, and constructions of signs by operations of combination.

The signs of a language differ in their **combinatory potential**, i.e. the set of conditions that enable them to form certain constructions. If they did not, a concatenation of signs in any order would produce a grammatical construction. No language is known to allow this, although languages differ in their liberality in this respect (Gil 1994). The categorization of the signs of a language in terms of grammatical classes assures **compositionality**, i.e. the possibility of construing the meaning of a complex expression by rules based on the meanings of its components and their combination. At the level of speaking and understanding, it eases the processing of the message (Bisang 2017, § 4.4).

3.2 Category and operation

In linguistics, a **category** is the intension of a class, a kind of topmost hyperonym for all of its members. It can consequently be viewed as composed of a set of features. For instance, the categories of participle and gerund can be conceived as sharing the feature [deverbal] and differing by the feature [adjectival] vs. [adverbial].

The categories of the signs of a semiotic system are typically viewed as its invariable basis. However, the entire area of categories in a language cannot be understood separately from the role of the operations that create and change them. Since language is, in the first place, an activity, the basis of the existence of linguistic signs is that they are created. In linguistic activity, a sign is created together with a **propositional operation** determining its function in communication.

- E4 a. El jardín es lindo.
SPAN 'The garden is beautiful.'
- b. Lo lindo es el jardín.
 'The beautiful (thing) is the garden.'

In both examples of E4, the designata of the expressions are the same. The sentences are nevertheless not synonymous because the expressions are used in different propositional functions (§ 5.2.1): *lindo* is used for predication in E4a, but for reference in #b. The function that a sign fulfills categorizes it. This category may remain formally implicit; but often it is marked by some grammatical means, as *lindo* is marked by the definite article in E4b, thus substantivized and rendered fit for subject function.

A category is the product of **categorization** (Pommerening & Bisang 2017, § 1). The category of a sign is, in the first place, part of the aim of producing it. In this, the speaker

operates on signs chosen from an inventory shared with the hearer and used as operands. These signs may or may not be already categorized (s. § 4.3). If they are and their category is the target category, they may be used without further ado. Otherwise, they will be converted into the target category. For instance, a language that possesses a category of adjectives has these available for adnominal modification. A language that lacks this category has an operation that converts a word designating a property into an attribute (Lehmann 2018, § 4.4.3.1). If these words are verbs, the operation will be relative clause formation. In Korean, properties and states are categorized as stative verbs (E5a). The operator converting them into attributes (E5b) is the same that forms relative clauses.

- E5 a. Pihaengki-ka ppalu-ta.
 KOREAN airplane-NOM fast-DECL
 ‘The airplane is fast.’
- b. ppalu-n pihaengki
 fast-ATTR airplane
 ‘fast airplane’

Products of linguistic activity may be lexicalized in the category that the underlying operation determined for them. The propositional operation of predication is subsidized by operations of **verbalization**, necessary in those languages which lack nominal clauses. These categorize their operands as verbs by conversion or by combining them with a verbalizer functioning as operator. More often than not, such a verbalizer is a formative grammaticalized from a verb meaning ‘be’ or ‘do’. For instance, beside a relatively small set of basic verbs, the bulk of Korean action verbs combines either a Chinese loan or a Korean noun with the **light verb** *hata* ‘do’. *Kongpu* ‘study’ is a noun, *kongpu-hata* ‘study’ is a verb.

The availability of operations serving predication, reference and modification is the presupposition for the possibility that verbs and adjectives are closed classes in some languages. Closed classes of verbs in a language of Papua New Guinea or Northern Australia may comprise as few as three verbs (Jingulu, Northern Australia; Pensalfini 2003); and many languages in that part of the world possess no more than one or two dozen of verbs. The full range of dynamic relational concepts is formed by combining such a verb with a coverb, similarly as a Portuguese **support verb** combines with an abstract noun to form a complex verb.

- E6 A Cecília deu um abraço no seu pai.
 PORT DEF.F.SG Cecilia give:PST.3.SG INDF.M.SG hug LOC:DEF.M.SG POSS.3.SG.M father
 ‘Cecilia hugged her father.’

The support verb construction in E6 replaces a simple verb form, viz. *abraçou* ‘hugged’. This kind of synchronic variation shows, at the same time, how a language might reduce, in the diachrony, an open class of verbs to a closed one. In analogous fashion, a closed class of adjectives may be complemented by processes of adjectivization (Lehmann 2005) and of relative clause formation (Lehmann 2018, §3.1.2). There are even

languages with very few basic nouns, the bulk of this class being deverbal nominalizations (Cahuilla, Seiler 1975). E9 illustrates how such a system could evolve in a Romance language, too.

There arises the question of the relation between a closed class and a class of function words. A class of function words is necessarily closed; but is a closed class necessarily one of function words? This is, in principle, an empirical question. Specifically closed classes of adjectives may throw doubt on this equation. However, the extent to which something is grammaticalized is a theoretical problem; consequently, the function-word status of such closed classes depends on the criteria of grammatical functionality. Nothing excludes a priori the possibility that grammaticalization shifts (the rest of) an entire class from the left to the right side of a system like Table 2 below, so that a given word class is only represented as one of function words.

The signs of a language are classified not only at different levels of grammatical complexity, but also below the taxonomic level of the word class. Specifically, many languages classify nouns in systems of gender, noun class, numeral or possessive classifiers and several more. This lower-level classification has different cognitive bases than the word-class system (Bisang 2017); but to the extent it is grammaticalized, it has the same function as any categorization, viz. to increase the redundancy in processing the message.

The category system of a language facilitates certain propositional operations and renders others more demanding; and it is apt to characterize the language typologically. It does not, however, constrain its speakers in any way.

3.3 Relationality

For a notion to be relational means that it is necessarily conceived with reference to another notion. The relation relevant here manifests as a syntagmatic relation in linguistic structure. In other words, the paradigmatic relation of a notion to other notions of its category does not render it relational. The other notion referenced by a relational notion is its **argument**. Among the semantic features of a linguistic sign, its relationality is one of a subset that is commonly converted into a grammatical feature. The **grammatical relationality** of a sign is its potential to contract syntagmatic relations with other signs. It is used in linguistic activity to build compositional complexes from the parts. There are two kinds of grammatical relationality.

Given signs A and R such that A is referential or predicative (§ 5.2.1); then R **modifies** A iff it predicates on A while, at the same time, subordinating itself to the function of A. This concept of self-subordination is the role of R in the endocentric construction [A R]_A. **Modifying relationality** is the potential to function as R in this construction. If A is a referential sign, viz. a nominal expression, then R is its attribute. If R is a word and selection of a nominal expression for A is one of the grammatical properties of its lexeme, then R is an adjective. If A is a predicative sign, viz. a verbal expression, then R is its adjunct. If R is a word and selection of a verbal expression for A is one of the grammatical properties of its lexeme, then R is an adverb. However, in

principle the role of A in the construction can be borne by members of any class. Modification of adjectives and of adverbs is not so frequent among the world's languages, but possible in many, including the Romance languages. Thus, the traditional word-class system subdivides the class of modifiers asymmetrically, opposing adnominal modifiers, viz. adjectives, to modifiers of anything else and calling these adverbs.

If the language provides a specific construction of the generic schema [A R]_A for some category A, then such a construction feeds the class A, can enrich it by lexicalization and thus stabilizes A in the language system. For instance, if a language has adjectives like Span. *andante* 'ambulating' and a class of modifiers of these like *bien* 'well', it can form constructions like *bien andante*, whose lexicalization produces the adjective *bienandante* 'happy'.

Given signs A and R such that A is referential, while R may have any function; then R **governs** A iff it determines the semantic and structural role of A in an exocentric construction [A R]_R, where R' differs from R in not combining with A. Semantically, A serves as a reference point for R that contributes to its individuation. **Governing relationality** is the potential to function as R in this construction. R may be of any major class. There are, thus, relational nouns, verbs, adjectives and adverbs. Typical relational nouns are kin terms like Port. *tio* 'uncle', body part terms like *cabeça* 'head' and nouns of spatial regions like *frente* 'front' and *costas* 'back'. Verbs may take more than one argument and be grammatically plurivalent. Relational adjectives take a complement like Span. *oriundo* [*de*] 'native [from]' or *harto* [*de*] 'fed up [with]'. A relational adverb is an adposition – a preposition in the case of the Romance languages. For instance, Span. *cerca* 'near' takes an optional complement via the relationalizer *de* 'of'. Without the complement, it is considered an adverb; with the complement, it counts as a preposition (Jespersen 1924: 88f, Lehmann 2019).

Here as everywhere, linguistic operations shape the semantic relationality in terms of grammatical relationality, so the latter may reflect the former or change it. For instance, the notion of eating is inherently bivalent, since if an entity eats, there is necessarily another entity that is eaten; the notion is not conceivable otherwise. Consequently, the verb 'eat' is bivalent in most languages. This does not prevent the use of verbs like Span. *comer* without a direct object, as if they were intransitive. A monovalent variant of eating may also be lexicalized as an intransitive verb, for instance in French *dîner* 'dine'. The grammatical relationality of a sign is the most important aspect of its combinatory potential.

4 The concept of 'word'

4.1 Word as a level of grammatical structure

The combinatory potential of a linguistic sign may be seen as a set of constraints on its use in constructions. The speaker produces and uses linguistic signs with different degrees of freedom. Quite in general, the higher the position of a sign on the hierarchy of structural complexity, the less strict are the constraints on its use. Considering the

extreme poles of the continuum, a sentence may be chosen freely instead of a different sentence and may be positioned earlier or later in the discourse. There are, to be sure, rules of text cohesion which may be violated by such operations; but there is hardly a rule of grammar at this uppermost complexity level. At the opposite pole, there is the word form which consists of free and bound morphemes. Every language has very strict rules – rules of morphology, in this case – on selection and combination of linguistic signs – morphs in this case – at this level. Selection of a morph in a word-form is limited to its paradigm, and its positioning is determined by sequential slots in the morphological structure. For instance, in Ital. *uguale* ‘equal’, the morph *-e* may be replaced by *-i* (PL) and nothing else, and it cannot be permuted. There are also rules of allomorphy at this level which are unknown at higher levels. For instance, the fact that masculine and feminine gender in adjectives of this declension class are neutralized in the morph *-e* is something that only interests the level of the word and is irrelevant for its agreement in syntax.

Between these two poles, a language may have more levels of grammatical complexity. These, too, are defined by the obtaining constraints on their paradigmatic and syntagmatic relations. For instance, a syntagma headed by a common noun, introduced by an article and optionally modified by an adjective attribute may, *salva grammaticalitate*, be replaced by a proper noun or a free pronoun and may be shifted into different syntactic positions just like these. The category of the noun phrase and, more in general, the level of the phrase are based on such results of distributional analysis. Languages systems differ in these levels of complexity.

Given such a hierarchy of levels of structural complexity, the **word** may be conceived as the unit of the level immediately above the morpheme (the simple sign) level, i.e. the unit where constraints of selection and combination of its components are strictest.⁴

4.2 Lexeme and word form

The expression ‘word’ is highly polysemous.

E7	Manus	manum	lauat.
LATIN	hand(F):NOM.SG	hand(F):ACC.SG	wash(PRS):3.SG
	‘One hand washes the other.’		

If we say that the word *manus* occurs twice in E7, we are referring to a **lexeme** meaning ‘hand’, quoted as *manus* but technically represented by its stem *manu-*. If we say that the word *manus* occurs once in E7, we are referring to the **word form** *manus* as glossed. If word classes are talked about, it is always lexeme classes that are meant. A lexeme may be conceived as an abstraction over the set of word forms which instantiate it.

Ancient Greek grammarians worked with a category called μέρη λόγου (*mérē lógon*), which Roman grammarians adopted as *partes orationis*. These expressions can mean, among other things, ‘parts of speech / of the proposition / of the sentence’. At any rate,

⁴ In the ideal isolating language, this level would seem to be absent since there would be no difference between a word and a morpheme. However, all isolating languages have compounding.

taken literally, the term refers to components of the text, not of the system. Now, specifically in a flexional language like Ancient Greek and Latin, a text is not composed of stems as representatives of lexemes, but of word forms. The ancient grammarians already abstracted from this, using the term ‘part of speech’ not specifically for forms that make a text, but for a grammatical class of lexemes. E8 renders the very first sentences of the most influential ancient treatment of the parts of speech.

E8 Partes orationis quot sunt? Octo. Quae? Nomen, pronomen, uerbum,
LATIN aduerbium, participium, coniunctio, praepositio, interiectio.
 ‘How many parts of speech are there? Eight. Which ones? Noun, pronoun,
 verb, adverb, participle, conjunction, preposition, interjection.’ (Aelius
 Donatus, *Ars minor*, §1)

There can thus be no doubt that Donatus’s parts of speech are lexeme classes, not classes of word forms.

It is a different question why the parts of a sentence should be thought to be words. The sentence might be composed of units of some other level of grammatical structure such as clauses or phrases (cf. Haspelmath 2012, § 2). This ancient conception is typical for the speaker of a flexional language, which is characterized by the **syntactic autonomy** of the word (Meillet 1948: 145ff). This implies that the words of a clause do not form phrases; instead the clause consists directly of word forms. While it is, in this formulation, slightly overgeneralized as far as the classical languages are concerned, this was, at any rate, the view of the ancient grammarians. Likewise, the Ancient Greek and Latin subordinate clause does not differ drastically in its internal structure from a sentence, so this distinction was not made either in ancient grammar.

In modern linguistics, occasionally a distinction between the terms ‘part of speech’ and ‘word class’ is postulated. However, in all grammatical descriptions, word classes are classes of lexemes (Haspelmath 2012, §10), no matter whether they are called lexical categories, syntactic categories, parts of speech or otherwise.

4.3 Levels of categorization

Whether an expression is meant to refer or to predicate is always signaled in some way and at some level of grammatical and discourse structure. Predication and modification are often distinguished formally. Such distinctions are typically, though not necessarily, achieved by formal categorization of the expressions in question. This categorization may be made at different levels of grammatical structure. The notion of ‘what remains’ is lexicalized in the Italian noun *resto* ‘rest’, used in the variant E9b, but avoided in the original version E9a.

- E9 a. “Il Chiesuolo di San Rocco” è quel che resta, invece, dell'antico oratorio di San Rocco ...
 ‘On the other hand, the “Chiesuolo di San Rocco” is what remains from the ancient oratory of St. Roch.’
<https://www.corpusitaliano.it/static/documents/sources/003/0031175>)
- b. “Il Chiesuolo di San Rocco” sono i resti, invece, dell'antico oratorio di San Rocco ...

In E9a instead, the marking of the predicate nominal of the main clause for its nominal category is not done at the level of the lexeme, but at the syntactic level of the relative clause. The speaker may ignore the availability of a lexical item in the category needed and instead apply a nominalizing operation at a higher level of grammatical structure.

In general, however, the categorization of a sign at a lower level of structure renders a higher-level operation targeting the same category unnecessary. In this sense, the categorization of signs – lexemes – in terms of word classes is a prior categorization offered by the system which frees linguistic activity from corresponding operations during speech.

The lowest level at which this first categorization can take place is the **root** (the lexical morpheme). The next higher level at which it may happen is the **stem** (the word form minus inflection). Some languages like Tongan (Polynesian, Bisang 2011, § 5.4) or Kharia (Munda) fail to categorize lexical signs at these levels and then generally do it at the level of the phrase or even the clause. Word-class systems which allow the use of the same word in referential, predicative and modifying function have been called flexible (Hengeveld 1992). Indo-European languages, at any rate, categorize signs at either or both of the lowest levels.

Latin differs in this respect from its daughter languages (Lehmann 2008[R]). In Latin, roots are acategorial (a statement which is basic to the medieval theory of the *Modi significandi*, the ‘modes of signifying’ [Lehmann 2002]). A root like *tim-* ‘fear’ can be neither declined nor conjugated; it belongs to no grammatical category. Stem formation applies to it, providing it with the suffix *-e-* to form a verb stem (*time-*) which can be conjugated, with the suffix *-or* to form a noun stem (*timor*) or with the suffix *-ido-* to form an adjective stem (*timido-*), both of which can be declined. These **thematic** (stem-forming) (sub-)morphemes or their like commute after roots like *liqu-* ‘liquid’, *liu-* ‘blue’ and many others. All words have their word class fixed at the level of the stem; very few roots are already categorized in terms of word class.

Spanish lacks such thematic formatives and such a mechanism of stem formation. *Temer* ‘to fear’, *temor* ‘fear’ and *tímido* ‘timid’ only apparently have the same morphological structure as the Latin examples. As a matter of fact, the elements *-or* and *-ido-* are of very limited derivational productivity, and *-e-* has none. The conjugation endings of *temer* are appended to *tem-*, not to *teme-*. Consequently, *tem-* is a Spanish verb root, *temor* is a noun root and *timid-* is an adjective root. As a result, the categoriality of roots is higher in Spanish than in Latin (Coseriu 1955, § 2.3.2, Lehmann 2008[R], § 3.4).

5 Criteria of classification

The construction of a set of parameters for the classification of words in languages is exposed to two opposite problems. If the criteria are language-specific, they are arbitrary from a general point of view and thus prevent cross-linguistic comparison of word classes (Haspelmath 2012, §9). If the criteria are the same for all languages, this may produce the same classes cross-linguistically, which we know is empirically incorrect.

It is not the particular criteria of classification which must be the same across languages, but the parameters of comparison. These are derived from a theory of language and allow for variation in their values. Since signs are double-sided, the parameters relate either to the expression or to its meaning. Expression-related parameters may apply to the sign as a whole or to its phonological or orthographic composition. While the latter kind can be and has been investigated, it generally does not produce a useful set of word classes. Parameters applying to the expression of a sign as a whole are distributional parameters. Parameters applying to the meaning of a sign concern its propositional function or the kind of notion it represents. Again, the ways in which these parameters are spelled out follow uniform theoretical principles. It is only at the lowest level, for instance when one word class is defined by its distribution relative to another class, that criteria become language-specific.

5.1 Structural criteria

5.1.1 Distributional analysis

Linguists uncover classes and constructions by retracing, as it were, the speakers' operations of selection and combination (§1); classes of linguistic units are established by operations of **substitution** (or commutation), constructions are established by operations of **permutation**. For instance, in E3, *pueblo* is replaced not only by a near synonym like *poblado* 'settlement', but also by *río* 'river', which changes the sense drastically, but still produces a construction of the same type and therefore may be registered as a member of a larger class. One also tries replacing it by other semantically related signs like *ciudad* 'town', producing *encima del ciudad*, which is not a viable construction. At this point, the class of signs which produce a construction by being inserted in the position after *encima del* is formed. Likewise, in the syntagma of E3, the strings *el bosque* and *el pueblo* may be permuted, producing *el pueblo por encima del bosque*, which means something different, but still is a construction of the same type. Likewise, the strings *bosque* and *pueblo* may be permuted. Permutability of a string is taken as evidence that it is a syntagma and a construction – maybe a minimal one. Conditions of the application of these methods are controlled. In tests of commutation, the context is kept unchanged; in tests of permutation, the items permuted are kept identical. As with any scientific method, the results obtained are as useful as the method employed and its constraints permit.

Certain methods of structural analysis are circular. Thus, when checking the paradigmatic relations of an item, its syntagmatic relations have to be kept constant (this is implicit in the above condition of producing a “construction of the same type”); and when checking its syntagmatic relations, its paradigmatic relations have to be kept constant. As long as the definitions based on these methods are not circular, the concepts formed by them can be theoretically valid and practically useful.

The **context** of a linguistic item is constituted by what precedes and follows it in the message. Such a contextual item may or may not bear a syntagmatic relation to the item whose distribution is being investigated. For instance, in E7, *manum* provides the following context for *manus*, but bears no syntagmatic relation to it. By contrast, *lauat* provides the following context for *manum* and does bear a syntagmatic relation to it. Contexts of the latter kind are selected for distributional analysis. Such syntagmatic relations are often shared by entire classes of items. Thus, the context may be provided by an entire category instead of just an individual item. Likewise, the item being investigated may be used in the same contexts as other items, so they form a structural class by this criterion.

The context for a lexical class may be defined by a particular grammatical formative. If this formative is a member of a larger paradigm, it is more common to define the lexical class as the class of those items which occur in the context of this paradigm. For instance, assume that we want to define the class of French common nouns as the class of those items which may constitute a construction together with a preceding article. If there is a paradigm of definite and indefinite article, as there is in the Romance languages, then choosing the entire paradigm instead of only one of the articles captures a larger class, since some common nouns do not occur after the indefinite article.

The **distribution** of a linguistic item is the set of contexts in which it occurs. For instance, an Italian adjective may occur, among other things, preceding (E10a) or following (E10b) a noun and following the copula (E10c). Any one of these contexts is insufficient to define the adjective as a word class. For instance, *ridicola* in E10a may be replaced by the non-adjective *la* DEF.SG.F, in E10b by the non-adjective *corrompe* ‘corrupts’ and in E10c by the non-adjective *peccato* ‘sin’.

- E10 a. *ridicola vanità* ‘ridiculous vanity’
 ITAL b. *la vanità ridicola* ‘the ridiculous vanity’
 c. *questa vanità è ridicola* ‘this vanity is ridiculous’

However, the entire set of these three contexts is not shared with any non-adjective. Then this distribution may be used for a **distributional definition** of the Italian adjective. At the same time, the concept thus defined would be a prototypical concept since some words like *tedesco* ‘German’ do not share the prenominal context and are nevertheless subsumed under the concept.

If there are heavy constraints on the selection and combination of grammatical formatives that co-occur with stems, such combinations may constitute the grammatical level of the **word form** (§ 4.2) The word form is then said to be inflected for the categories that such formatives belong to. Such a system is typical of many languages of

the world, including all Indo-European and, consequently, the Romance languages. In such a language, the morphological slot that a paradigm of affixes appears in may be used as the definitory context for a distributional definition of the class of lexemes on which they appear. For instance, a verb stem may be defined as whatever directly precedes the infinitive ending, or whatever inflects for tense (this criterion being eponymous for the German school-grammar term *Zeitwort* (tense:word) ‘verb’). This type of morphological definition of a (major) word class has been in use in the European grammaticographic tradition since its beginning in Ancient Greece.

There are, however, languages whose words do not inflect, traditionally called isolating languages. Their words appear in texts as stems, so their classes cannot be defined morphologically. However, just as in a flexional language, the immediate context of the stem provides the criterion for a distributional definition. In this case, the immediate context will mostly be constituted by free grammatical formatives instead of the inexistent affixes. Thus, while in a flexional language like Latin, the noun may be defined as a word that inflects for case, in a Romance language it may be defined as the head of a syntagma that depends on a preposition. Thus, while one often distinguishes between morphological and syntactic definitions of word classes, the definitory procedure is actually essentially the same for any type of language.

5.1.2 Limits of distributional definitions

Distributional criteria do not suffice for the establishment of a language’s word classes, for two reasons. First, assume that all of them are defined by their distribution. The distribution is the set of contexts that the members of each class occur in. These contexts are defined as occupied by members of other distribution classes. These, too, have been set up in the same way; i.e. they presuppose the availability of other distribution classes. Consequently, the procedure and the resulting definitions are of necessity circular. Distributional definitions presuppose the prior existence of contextual fixpoints, including classes, which are not defined distributionally.

Second, it is an empirical fact that word classes that are of theoretical and practical interest for linguistics are heterogeneous in terms of the distribution of their members. The French nouns *ami* ‘friend’, *amitié* ‘friendship’ and *sel* ‘salt’ differ in their distribution. This leads to the establishment of subclasses of the given word class – concrete, abstract and mass nouns, in the case of these examples. However, on the one hand, even these subclasses are internally heterogeneous; so the procedure of generating subclasses may be carried on (Croft 2005). On the other, one now has to select, among the contexts making up the various distributions, those that are criterial for an entire word class. This selection is necessarily guided by theoretical principles which do not emerge by themselves from the data (Evans & Osada 2005).

The first of these problems can partly be avoided if **topological positions** of the clause or sentence can be referred to as contextual fixpoints. For instance, many languages have a class of particles whose occurrence is limited to the end of the sentence, like the Japanese sentence-final particles. These may then provide the anchor

for another category, plausibly the verb in the case of Japanese. The topological positions available for this kind of distributional definition are the left and the right clause or sentence boundary and Wackernagel's position, i.e. the position following the first constituent. This kind of distributional definition presupposes a language system with rather fixed word order.

Otherwise, the basic problem with distributional definitions is commonly addressed by defining a subset of classes of signs by enumeration. This requires that the classes in question be closed. With the possible exception of certain cases (§ 3.2), they are consequently classes of grammatical formatives. Once we have formed, in this way, the class of articles of the language, we can now define the class of common nouns by their occurrence after an article. Likewise, once we have defined a class of personal endings by enumeration, we can define the verb as the class of words which assumes these endings. Needless to say, defining, instead, the paradigm of personal endings distributionally as the paradigm of the last suffixes in the morphological structure of the verb would involve circularity.

5.2 Semantic criteria

5.2.1 Propositional functions

In cognition – more precisely, in the propositional memory – knowledge is represented as a network of entities connected by relations. It is dynamized in communication. The meaning of a minimal structured utterance is a **proposition**. It structures cognitive relations in terms of referents and predicates. **Reference** and **predication** are the basic propositional operations; speakers and hearers want to be sure what is said about what. Most languages have, in addition, a level of downgraded predication, called **modification**, which enriches the notional basis of a referential or a predicative expression (cf. § 3.3).⁵ While languages differ in the level at which they signal these functions (§ 4.3), the two basic propositional operations are the essential basis for the constitution of nominal and verbal expressions, while modification of nominal and verbal expressions is the basis of adjectival and adverbial expressions (Croft 1991, Hengeveld 1992). Propositional functions are subsumed under pragmatic, not under semantic criteria of word classification in Bisang 2011, § 2.2.

For a proper understanding of the terminology, the following must be noted: The attributes 'referential', 'predicative' and 'modifying' apply, in the first place, to the function of a particular expression in a particular discourse. Specifically, an expression there is referential if it has a referent. In the present context, we are talking about signs as elements of a system. Here 'referential', 'predicative' and 'modifying' relate to a **potential** which the signs in question have.

If, in a language, words are categorized in one of these classes, they can be used directly, without any grammatical operation that marks or converts their category, in those syntactic functions which correspond to the propositional operations. This does

⁵ The pair 'predication vs. modification' has a structural counterpart in Jespersen's (1924, ch. VIII) 'nexus vs. junction', although Jespersen (p. 114) does not consider junction a "degraded predication".

not exclude the use of words thus categorized in other syntactic functions. It does, however, require the application of a recategorization operation and, consequently, more expressive cost (Croft 1991 speaks of ‘markedness’). Given this, the **primary function** of a word class is that function which it fulfills without further ado (Hengeveld 1992, Lehmann 2018, § 2.3).

This conception may be illustrated by the definition of the adjective in a Romance language.

- E11 a. La città è bella.
 ITAL DEF:F.SG town(F) COP.3.SG beautiful:F.SG
 ‘The town is beautiful.’
- b. la città bella
 DEF:F.SG town(F) beautiful:F.SG
 ‘the beautiful town’

The item in question, *bella*, is used in predicative function in E11a, but in attributive function in #b. In both contexts, it agrees in gender and number with its head noun. However, its use in E11a requires a copula, while its use in #b requires nothing but mere juxtaposition with its head noun. Consequently, the modifying function seen in #b is its primary function. In another language, the mark of predicative use of an adjective may be different, e.g. a verbalizing derivation or word order with prosody in a nominal clause.

This is the basis for definitions such as these: A noun is a word which, qua member of its word class, has the primary function of reference. A verb is a word which, qua member of its word class, has the primary function of predicating. An adjective is a word which, qua member of its word class, has the primary function of modifying a noun. An adverb is a word which, qua member of its word class, has the primary function of modifying a verb. Operationalization of such definitions requires identification, in the language, of those syntactic constructions which fulfill the function in question. The constant hedge “qua member of its word class” is necessary to forestall the role of the lexical meaning of a specific member of the class. A shorter version of these definitions would consequently read “the category ‘verb’ has the primary function of predicating”, and so forth.

5.2.2 Notional classes

The idea that a word class is some kind of semantic supercategory has been behind traditional conceptions of word classes since antiquity. It was elaborated to a remarkable level of complexity in the theory of the *Modi significandi* and lives on in German school grammar terms for the parts of speech like *Eigenschaftswort* (property:word) for adjective. Modern notional theories of word classes generally invoke prototype semantics to maintain this approach (§ 2.2): Not every noun designates a thing, but the prototypical noun does. Likewise, the prototypical verb designates an act and the prototypical adjective designates a property. There is no prototypical adverb, though, because there are too many unrelated ways of modifying a verb.

While a prototypical conception of notional classes is not by itself theoretically faulty, notional definitions of word classes are faced with insurmountable methodological problems. Not the smallest of these is the impossibility of operationalizing such a definition. Acts and properties can as well be designated by nouns like Port. *abraço* 'hug' (E6) and *peso* 'weight'. Then why is *abraçar* 'to hug' a verb, but *abraço* not? And again, why is *pesado* 'heavy' an adjective, but *peso* not? Such examples show that what underlies these categories is the propositional operation that they are designed for.

The notional properties of word classes are, however, not completely irrelevant at the theoretical level; nor are they useless for methodological purposes. It remains a fact that prototypical nouns, verbs and adjectives designate things, acts and properties. Thus, a theory which takes the propositional function to be fundamental has to explain the existence of these notional properties of word classes.

Given the premise that a language lexicalizes notions in the category apt to their role in linguistic operations, the question arises which kinds of notions would usefully be inventoried in which word class. The most important property of notions which determines their primary categorization in terms of a word class is their relationality (§ 3.3). If a sign is used as a predicate, it relates to something on the same plane, viz. to that other sign – its argument – of which it is a predicate. It contracts this relation by itself if it is inherently relational. Notions involving relations to more than one argument are notions of events. Consequently, notions of events lend themselves most easily to predication and are therefore typically categorized as grammatically multivalent signs, i.e. verbs.

If a sign is used for reference, it relates to an entity of a different plane, viz. a referent. This is not a syntagmatic relation, so such signs need not be relational. On the contrary, if they are relational, their individuation for reference may require prior combination with their argument. Non-relational notions are notions of things. Consequently, notions of things lend themselves most easily to reference and are therefore typically categorized as grammatically avalent signs, i.e. nouns.

Between these poles, there are notions that are apt to modify other notions. These require a single argument position for the sign thus modified. A subset of these modifiers select referential expressions as their argument. Notions possessing this relationality include properties and states. Consequently, notions of properties and states are typically categorized as adnominal modifiers, i.e. adjectives.

This does not, of course, entail that verbs designate events, nouns designate things etc. Nor does it exclude the existence of relational nouns and of avalent verbs. However, it suffices to understand why signs of these three notional categories are typically categorized in the respective three word classes.

Summarizing, the essential semantic factor determining the categorization of a sign in terms of a word class is its primary role in forming a proposition. This, in turn, favors the recruitment of signs of certain notional categories for these word classes.

There is one notional class not constituted in this way. If a grammar counts with a class of **numerals**, this is necessarily conceived on purely notional grounds, viz. as the class of those elements that denote the cardinality of a set. In structural terms, numerals

tend to be similar to one of the major classes. Inside a language, the class is often structurally heterogeneous as lower numerals like Span. *cuatro* ‘four’ behave more like adjectives while higher numerals like *millón* ‘million’ behave more like nouns.

5.2.3 Categorical meaning

At the level of designation, there is little difference between *un joven español* ‘a Spanish youngster’ and *un español joven* ‘a young Spaniard’; the former is likely to be contrasted with a non-Spanish youngster while the latter is likely to be contrasted with an older Spaniard. This shows that the word class contributes little if anything to the designation of an expression. The intension of a word class is, first of all, a syntactic category, not a semantic category.

Meaning emerges in contrast. The members of a class, in particular a distribution class, bear paradigmatic relations to each other. Different distribution classes do not bear paradigmatic relations to each other. This would presuppose that they could be selected in the same context; and precisely this is excluded by their being different distribution classes. As a consequence, there is never the possibility of contrasting, in a given context, two signs which only differ by their word class. If the speaker does not have a choice between A and B, but is forced, in the given context, to use A, then there is no semantic effect that he might achieve by using A and not B. To the extent that distribution classes do not contrast semantically, the question of their categorial meaning does not arise.

It is, however, possible to force, at the syntactic level, a member of a word class into a syntactic function which is proper of another word class. For instance, in a language where a nominal predicate requires a copula, this allows using a noun in predicate function, as in E12b.

- E12 a. Mi amigo jugó.
SPAN ‘My friend played.’
- b. Mi amigo fue jugador.
‘My friend was a player.’

The verb in E12a predicates an activity on the subject. An activity is, in principle, time-bound. While E12a does not exclude an interpretation like E12b, its most straightforward sense is that of a specific and contingent involvement of its subject referent in the activity in question. In E12b, the semantic head of the predicate is a noun. It categorizes the subject referent as one engaged in the activity in question, which entails that this categorization is somehow essential for this referent. Similar semantic properties can be demonstrated for the adjective as opposed to the noun and the verb. Quite generally, a noun subsumes its designatum under a class, thus naming its essence. An adjective attributes a property or state, thus a characteristic of intermediate stability, to its argument. A verb conveys that its arguments participate in a situation, which may be entirely contingent and tangential to their essence. This gradual semantic difference between the major categories has been called their **time-stability** (Givón 1979, ch. 8). It

is a gradual parameter characterizing the notions coded by the word classes of noun, adjective and verb and decreasing over this series. This decrease correlates with increasing relationality: The prototypical noun is avalent, adjectives need one argument position, verbs may be multivalent. Intuitively, the interdependence of a notion with its relata renders it less stable.

Such observations mitigate a bit the verdict on the asemanticity of the word classes. Here as everywhere, semantic distinctions may be achieved if the entities in question can be contrasted in the same function. Although this does not correspond to the *raison d'être* of word classes, transposition at the syntactic level renders it possible.

6 Non-prominent word classes

6.1 Major and minor classes

The word classes of a language are divided into major and minor classes (Lyons 1968, ch. 7.1.3). A **major class** is one that may be enriched by rules of the language system, a **minor class** is one that cannot. This possibility of enrichment presupposes rules for the formation of items of the same category. If these are rules of syntax, the category is said to project higher levels of syntactic structure. In this sense, each of the categories noun, adjective, verb, adverb, preposition and conjunction is the head of a corresponding phrase. Otherwise, the rules enriching a category may be ones of word formation. There are such rules for the first four classes enumerated before. Prepositions and conjunctions are first formed by rules of syntax, like Ital. *in cima* [*a*] (in top [to]) 'on' and *visto che* (seen that) 'since' and then unverbated, like *attorno* [*a*] (at:turn [at]) 'around' and *perché* (through:that) 'because'. Since there are processes of word formation for lexical items, but not for grammatical formatives, a major class consists of lexical items, a minor class of grammatical items. These were earlier called autosemantic vs. synsemantic items and, more recently, **content words** vs. **function words**, resp. (Bisang 2011, § 4).

A minor class is not fed by processes of a synchronic system. It comes into existence and may be fed by grammaticalization (Lehmann 2015). Many such cases are historically documented, specifically for the Romance languages (Klausenburger 2000). One example may suffice here (Lehmann 2008[a]): In Ibero-Romance, there was a lexical verb *ficar* 'fix'. It acquires an intransitive use 'get settled [in a place]' and successively combines with an adverbial, an adjectival and a nominal complement. Subsequently, non-finite verb forms figure in complement function. Thus we get Port. *fica feito* 'is made', *fica a fazer* and *fica fazendo*, both 'is making'. With these uses, the erstwhile lexical verb is now an auxiliary (dubbed 'pro-verb' in Table 2), increasingly invading the domain of older *estar* 'be [in a state or position]'.

In this way, in principle all the lexical classes have a corresponding grammatical class. This is shown for one language in Table 2.

Table 2 *Lexical and grammatical subclasses of Portuguese word classes*

lexical		grammatical	
category	example	category	example
noun	<i>menina</i> 'girl'	pronoun	<i>ela</i> 'she'
adjective	<i>rouxo</i> 'red'	pro-adjective	<i>tal</i> 'such'
verb	<i>existir</i> 'exist'	pro-verb	<i>estar</i> 'be (found)'
adverb	<i>seriamente</i> 'seriously'	pro-adverb	<i>assim</i> 'thus'
preposition	<i>além</i> 'beyond'	grammatical preposition	<i>de</i> 'of'
conjunction	<i>enquanto</i> 'while'	grammatical conjunction	<i>que</i> 'that'
interjection	<i>puxa!</i> 'gosh!'	grammatical interjection	<i>sim</i> 'yes'

Table 2 is a one-dimensional classification as it stands, but would become a cross-classification if the criteria generating the categories were indicated in the row headings.

It should be clarified that, by the criterion of susceptibility to enrichment by rules of the system, all of the classes on the left-hand side of Table 2 are indeed major classes. This must only be adjusted for **interjections**. There certainly are complex interjections like Ital. *Grazie a Dio!* 'Thank God!' or *Santi numi!* 'Good heavens!' which do enrich the inventory. They differ, however, from phrases of the other categories by lacking a uniform structure since the interjection is not the head of an interjection phrase. By failing on the criterion of projection, interjections might be grouped with the particles (§ 6.2). However, they differ from (all the other) particles in some respects. First, they may be lexical rather than grammatical (Table 2). Second, they are holophrastic, i.e. they commute with a whole sentence, but do not integrate into one. Semantically, they are speaker-deictic, i.e. they convey a state of the speaker's mind.

Given the gradual nature of grammaticalization, the boundary between the left and the right half of Table 2 is not clear-cut. In principle, each of the minor classes is a subclass of the overarching word class. However, grammaticalization changes the distribution of the items undergoing it. On the one hand, they become less sensitive to semantic selection restrictions. On the other hand, they get subject to increasingly rigid rules of grammar which tighten their paradigmatic and syntagmatic relations, pressing them into a paradigm and into a structural slot. In view of this, a minor class may be seen as a subclass of a word class with stricter distribution.

Moreover, while the table covers the most wide-spread major classes, grammaticalization may lead to many more different minor classes. The grammaticalization of verbs is especially productive. The category called pro-verb in Table 2 comprises not only auxiliaries (s. ch. 13 of this vol.), but also different kinds of verboids, including existentials like Spanish *haber* 'be there' and what are called in different descriptive traditions light verbs and support verbs (§ 3.2). Positionals are verboids meaning 'stand, sit, lie ...', which fulfill auxiliary functions in many languages, but such a paradigm is absent from Romance languages. Nouns are the source of classifiers of different sorts, like numeral classifiers, article classifiers and possessive classifiers, all of which are missing from Romance languages.

The left-right orientation of Table 2 corresponds to the direction of grammaticalization. The process, however, does not stop at the point of function words. If these are grammaticalized further, they become bound formatives, most typically affixes of inflection, but also of derivation. To mention but one example, the Latin lexical verb *habere* ‘have’ became an auxiliary in Proto-Romance and further the tense suffix in the synthetic future of the type Port. *cantarei* ‘I will sing’, etymologically *cant-ar-ei* (sing-INF-have.1.SG) ‘I have to sing’. Expanding, in this way, Table 2 by a further column at the right, a dynamic theory of word classes which incorporates the minor classes connects the word-class system up with the morphological system of the language.

Grammaticalization reduces signs to their categorial and relational features. The former is illustrated by personal pronouns, the latter by case relators. In their combination with lexical signs, they mark the category and relation of the latter and support the construal of the sense of the message. Given the existence of maximally isolating languages like Late Archaic Chinese (Bisang 2011, § 5.3), which function largely without the use of grammatical formatives, it may be generalized that grammatical formatives enhance the redundancy of a text, thus relieving the hearer’s task of inferencing.

6.2 Adverbs and particles

The **adverb** is a major class, as there are both adverbs produced by rules of word formation like Ital. *letteralmente* (literal:ADVR) ‘literally’ and adverbials produced by rules of syntax like *quasi letteralmente* ‘almost literally’. This class is heterogeneous both structurally and semantically. On the one hand, an adverbial may attach to a verbal expression at different hierarchical levels of syntax. On the other, there are adverbs of place, time, manner and mode, and they differ in their formation and distribution in most languages. Accordingly, the class of adverbs will have a very different conformation in different languages.

There are languages with a single class of modifiers. Hixkaryana (Cariban) lacks both adjectives and attribution. All modifiers function syntactically as adjuncts even if they relate semantically to a nominal expression. In Cabecar (Chibchan), although there is a class of adverbs, all adjectives can be constructed as adjuncts even if they semantically modify a nominal expression, as in E13.

E13 ká s̥aw-é r-á=m̥a i te kalabé
 CABECAR space/time see-IPFV emerge-PROG=DUR 3 ERG whole
 ‘he walked around checking the whole place’, more literally: ‘he saw the whole place coming around’

One worldwide important source of enrichment of the class of adverbs are adpositional phrases. An adposition only differs from an adverb by its relationality, as it takes a complement. If it unverbates with its complement, a complex adverb results. Thus Span. *al rededor* (to:DEF.M.SG environs) ‘around’ is yet a prepositional phrase; but it is optionally unverbated to the adverb *alrededor*.

The traditional concept of **particle** (Lat. *particula* ‘little part of speech’) comprises all words which do not inflect, thus even adverbs, prepositions and conjunctions. These make the category of particle even more heterogeneous, but may be kept out by the criterion that they may be enriched by processes of the language system. Moreover, the traditional class of **conjunctions** is internally heterogeneous, as it usually comprises coordinative and subordinative conjunctions. Subordinative conjunctions in particular are in many languages including the Romance languages just a subclass of adpositions, viz. those adpositions which select a clause as complement (Jespersen 1924: 89). This is most easily seen with such relators which can function both as preposition and as conjunction.

- E14 a. Juan no trabaja por su enfermedad.
SPAN ‘John does not work because of his illness.’
- b. Juan no trabaja porque está enfermo.
‘John does not work because he is ill.’

In E14a, the complement of the preposition *por* ‘through’ is a noun phrase; in #b, it is the clause introduced by the subordinator *que*. Thus, in many languages subordinative conjunctions are at an inferior level of the word-class hierarchy.

The particle is by definition a minor part of speech. It does not project, i.e. there is no particle phrase. This does not exclude the possibility of serializing particles in certain sentence positions; still, they do not form a syntagma. Interjections, which are often subsumed under particles, have been separated from them in § 6.1. Another word class often subsumed under the particles is constituted by **ideophones**. These are words which convey a holistic representation of a situation type, providing the interlocutor with a more vivid idea of the situation designated. On the expression side, they are peculiar in being onomatopoeic if they designate an acoustic situation, like Ital. *glu glu* ‘glug glug’, and sound symbolic if it is a situation perceptible otherwise, like *zac* ‘zap’, or even only sensed. Languages differ in categorizing ideophones with other word classes. They may be holophrastic, but they may also accompany a predicate and thus be a subclass of adverbs.

Once these categories are factored out, there remain particles *stricto sensu*, including phase particles like Span. *ya* ‘already’ and *aún* ‘yet’, connectives like *y* ‘and’ and *o* ‘or’, scope particles such as the negator *no* or the limitative particle *sólo* ‘only’ (s. ch. 17). Their classification follows strictly language-specific distributional criteria. There may be lexical sources for the grammaticalization of some of these subclasses, but in general there is no major counterpart to this minor class, which is why it does not appear in Table 2.

Particles are often hard to distinguish from adverbs. Italian words like *via* ‘off, away’, *su* ‘up’ and *giù* ‘down’ may be classified as adverbs or particles. Here again, distribution is the decisive criterion. Generally, genuine adverbs like *domani* ‘tomorrow’ or *indietro* ‘back(wards)’ have a rather liberal distribution, while particles are more constrained to specific positions.

Clisis is a low-level classificatory criterion for minor-class words; it does not yield a useful primary classification. Among the members of a given distribution class, some may be clitic, others not, without any other correlate.

7 Setting up the word classes of a language

Distribution classes do not fall from heaven. They are established by the linguist who chooses certain contexts over others as criterial. This initial choice will typically be guided by semantic properties of the items in question. Therefore, the traditional, although mostly implicit, method for setting up the word-class system of a particular language will typically proceed along two different lines. On the one hand, the propositional functions and notional categories of §§ 5.2.1f are used both for initial inspiration and as a theoretical foundation of the classes to be established. On the other hand, criterial contexts in the sense of § 5.1 are identified which the distribution and, ultimately, the definition of the word classes may be based on.

One starts out with an initial hunch that the language will possess words designating objects like 'tree', 'bird', 'head', words designating dynamic relational concepts like 'come', 'burn', 'put', 'eat' and words designating properties like 'big', 'old', 'good'. In other words, one uses prototypical members of the notional categories in question as a starter. In the next step, the distribution of each of the corresponding words is investigated. Here the second line comes into play. Some of the contexts are constituted by grammatical formatives. As a side step in the overall process, one now sets up the paradigms of these formatives. At this point, the method (though not the resulting definitions) becomes circular because setting up such a paradigm requires using just the same words as its context whose class will ultimately be based on co-occurrence with that paradigm.

Inside each of the three notional categories, the distributions of its elements are compared. If they do not coincide sufficiently, the test class is enriched by more candidates and allomorphy is factored out until a stable set of distributional properties emerges. At this point, less than three distinct sets of distributional properties may emerge. Then those provisional categories which do not differ in distribution are merged. Concretely, property words may be nouns or verbs instead of adjectives. In the next step, the distinct sets of distributional properties found are exploited for defining (maximally) the distribution classes of nominal, verbal and adjectival expressions of the language. However, the distribution of each of these categories comprises different contexts. Moreover, each distribution class is typically heterogeneous (s. § 5.1). Therefore those contexts are chosen as criterial which correspond to the propositional functions of reference, predication and nominal modification, resp. In a last step, it will be checked whether the classes thus established are indeed classes of lexemes or rather of more complex expressions. Only in the former case do they count as word classes.

In principle, the class of adverbs is established as the class of those words whose primary function is the modification of verbs. This class will be very heterogeneous, so additional, more language specific criteria will have to be used to establish relevant subclasses.

Then, the minor classes are established. Some of them have already been set up by enumeration. Others can be defined distributionally, with reference to the major classes or to syntactic boundaries. This concerns, above all, the various classes of particles.

One structural criterion will prove of relevance for the subclassification of most of the classes established heretofore, and this is grammatical relationality. For each category, it is checked whether its members govern a complement. This may lead to the establishment of transitive verbs, adpositions as adverbs provided with government, relational nouns and relational adjectives.

This method is, of course, guided by the theory expounded here. It leads to a certain degree of uniformity of word-class systems across languages, though not to a universal set of word classes. Different theoretical assumptions lead to different word classes. If such assumptions are not made, a set of unwieldy size of distribution classes emerges, which serve no useful purpose.

8 Conclusion

Just as any other trait of grammar, the word classes of a language system are, in the first place, a specific property of that language. Word classes differ from one language to the next and may change in the diachrony. Spanish has a class of articles and one of (semi-)auxiliaries like *ser* 'be', *estar* 'be (found)', *haber* 'have, be there', *quedar* 'stay', *ir* 'go' and several more. Apart from *esse* 'be' used as an auxiliary in some forms of the passive, Latin lacks both classes. Just like the issue of the categoriality of roots, the conformation of the word-class system of a language is an empirical question. This means it has to be found out by the methods described above. It is not the task of a theory of grammar to stipulate a universal set of word classes.

This is not to deny that there are universals underlying the conformation of word-class systems. Since the propositional operations of reference and predication are universal, the distinction between a nominal and a verbal category is universal, although it does not need to manifest itself in the form of classes of lexemes. Likewise, since grammaticalization is a universal process, the distinction between lexical and grammatical classes is universal; even the most isolating language has grammatical formatives like pronouns, conjunctions and negators. On the other hand, at least one of the traditional major classes is not universal: there are quite a few languages lacking adjectives. Moreover, certain minor classes such as the articles and (semi-)auxiliary verbs are characteristic of Romance languages.

On the one hand, word classes have partially unrelated functional bases. On the other, they do not contrast on the paradigmatic axis. These conditions are responsible for the impossibility to provide a complete classification (§ 2.1) for them.

Abbreviations in glosses

1, 2, 3	1 st , 2 nd , 3 rd person	ADVR	adverbializer
ACC	accusative	ATTR	attributor

COP	copula	LOC	locative
DECL	declarative	M	masculine
DEF	definite	NOM	nominative
DUR	durative	PL	plural
ERG	ergative	POSS	possessive
F	feminine	PROG	progressive
INDF	indefinite	PRS	present
INF	infinitive	PST	past
IPFV	imperfective	SG	singular

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