These arguments are obviously shaped by many assumptions about the nature and limits of linguistic competence. In the absence of a clear understanding of how the brain a*ctually does* process and store language, linguists have assumed that their description of assumed linguistic competence should reflect the same criteria of economy and non-redundancy that operate in real paper dictionaries. Thus, much linguistic research has assumed that the mental lexicon does not contain a huge number of independently listed entries, but that it extracts the maximum number of generalizations about the meaning of a verb like *cut* across all its collocational contexts, in order to present the most economical, least redundant entry. As a result, it has been the topmost solution in Figure 2.1 that has traditionally been considered preferable. We will see in later chapters how this assumption has been challenged in more recent theories of language. One of these, in particular, known as **cognitive linguistics**, specifically rejects the dichotomous reasoning we see embodied in the claim that *either* the separate listing *or* the compositional approach should be adopted to the question of the mental representation of the meaning of collocations like these. According to linguists in the line of Langacker (1987), this sort of thinking is an example of the **exclusionary fallacy**, the idea that 'one analysis, motivation, categorization, cause, function or explanation for a linguistic phenomenon necessarily precludes another' (Langacker 1987: 28). Langacker continues:

From a broad, pretheoretical perspective, this assumption is gratuitous and in fact rather dubious, in view of what we know about the multiplicity of interacting synchronic and diachronic factors that determine the shape and import of linguistic expressions. (ibid)

Thus, even though it might seem inelegant to list all the different collocations of *cut* separately in the lexicon, this option should obviously not be rejected if it somehow turns out (for example, through neuroscientific experimentation) that this is, in fact, what speakers (unconsciously) do. And this discovery would not of itself invalidate the idea that speakers also *simultaneously* represent *cut* as having an independent meaning or set of meanings which enter into composition each time the verb gains a new set of arguments.

2.3 Different ways of defining meanings

So much, then, for the question of which units should be attributed definitions. In this section we will discuss a number of different ways in which a word's meaning can be defined.

2.3.1 Real and nominal definition

As already noted, the concept of definition goes back to Aristotle, who discussed it at a number of points in his voluminous works. One of the most important Aristotelian treatments of definition is to be found in the

Posterior Analytics, a treatise devoted to the explanation of the structure of scientific knowledge. As discussed there, a definition (*horismos*) has two quite different interpretations: 'in defining,' says Aristotle, 'one exhibits either what the object is or what its name means' (Tredennick 1960: II.7.92b). A definition can therefore be considered either as a sort of summation of the essence or inherent nature of a thing (**real definition**; Latin *res* 'thing'), or as a description of the meaning of the *word* which denotes this thing (**nominal definition**; Latin *nomen* 'name, noun'). Since Aristotle is interested in providing a basis for an understanding of nature, it is the first interpretation which he adopts: a definition of thunder, for example, is not a description of the meaning of the word *thunder*, but expresses thunder's essential nature (for Aristotle, the noise of fire being extinguished in the sky).

Some people have considered that definitions of the underlying nature of objects are the only type of definitions which can be of interest. Diderot, for example, stated that 'definitions of words differ in no way from definitions of things' (quoted in Meschonic 1991: 102). And since it is scientific research which is taken to reveal this underlying nature, these definitions will be formulated by scientific disciplines. The influential American linguist Leonard Bloomfield stated in a well-known passage that

The situations which prompt people to utter speech, include every object and happening in their universe. In order to give a scientifically accurate definition of meaning for every form of a language, we should have to have a scientifically accurate knowledge of everything in the speakers' world. The actual extent of human knowledge is very small, compared to this. We can define the meaning of a speech-form accurately when this meaning has to do with some matter of which we possess scientific knowledge. We can define the names of minerals, for example, in terms of chemistry and mineralogy, as when we say that the ordinary meaning of the English word salt is 'sodium chloride (NaCl)'…

Bloomfield (1933: 139)

On the other hand, according to Bloomfield, 'we have no precise way of defining words like *love* and *hate*' (ibid.). On this understanding, therefore, linguistics should appeal to technical scientific disciplines in formulating definitions; the true meaning of a natural language word, according to Bloomfield, is to be identified with the scientific 'definition' – or best possible theory – of its denotation. As a result, whenever a scientifically established definition of a denotation is missing, there is, simply, nothing that linguistics can say with any certainty about the word's meaning. (One problem with this is that scientific conceptions of the nature of objects are continually changing: just think of the current best theory of space, mass, light, or matter in the world view of modern physics, compared to the same notions just a hundred and fifty years ago, before the advent of relativity and quantum mechanics. These scientific developments radically changed our picture of space, mass and so on, but surely didn't have any effect on our everyday meanings.)

Bloomfield's view is a serious obstacle to a comprehensive account of meaning, for it is not just 'abstract' nouns like *love* and *hate* which lack a scientific definition, but the vast majority of the vocabulary of any natural language. There are two reasons for this. The first is that, as we saw in Chapter 1, words like *unicorn*, *time machine* and *light sabre* lack any denotation in the real world but nevertheless have a meaning. Secondly, most of the vocabulary of a language has only a small amount of overlap with terms of the sort which interest empirical science: most of the vocabulary consists of words for a huge variety of objects, processes, relations and states which have no simple analogue in the scientific picture of reality (think of *reportage*, *postpone*, *ready*).

There is another reason, however, to reject Bloomfield's approach to definition: even in the case of terms like *salt* which *can* be associated with a scientific definition, we do not want to say that the scientific definition ('NaCl') has anything to do with most speakers' understanding or use of the word. While this definition might perhaps be satisfactory as a real definition of actual salt, it is certainly unsatisfactory as a psychologically realistic one. Thus, people use and understand the word *salt* even without specialized scientific knowledge; indeed, English speakers' first exposure to this word will come at an age when the technical scientific knowledge that supposedly defines it is entirely inaccessible. Speakers with training in chemistry may eventually *come* to understand *salt* in this way; but this can only happen after they have already acquired the everyday, nontechnical meaning of the word. For these reasons, we will reject Bloomfield's approach to definition: linguistic semantics aims to define the meaning(s) of a word, not the underlying essence of the object it refers to. It is thus concerned with nominal, not real definition.

Before proceeding further, we need to distinguish two different functions which a nominal definition may fulfil: fixing the meaning of a word so that there can be no ambiguity about its denotation, and bringing about an *understanding* of the meaning of a word in someone who does not already understand it, typically in order to enable the word to be correctly used. Many actual definitions aspire to fulfil both these functions simultaneously. The two functions are, however, rather different, and they should be kept apart. In order to differentiate between them, let us call the first type of definition **extensional definition**, and the second type **cognitive definition** (Figure 2.2). Thus, the definition 'featherless biped' is an extensional definition of the noun *human*, since it accurately identifies all and only the members of the class of humans.

FIGURE 2.2
Types of definition.
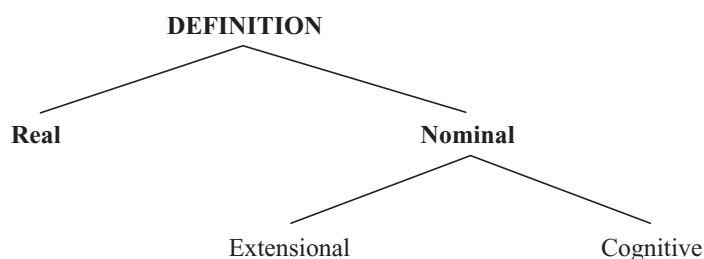
It is not, however, necessarily a very good cognitive definition, since *human* is not typically conceived of in terms of bipedality or absence of feathers: when we reflect on our concept HUMAN, we are likely to think of many different characteristics – a certain physical form and range of behaviours – before these ones.

2.3.2 Definition by ostension

As we saw in Chapter 1, the most obvious way to define many words is, simply, by ostension, or by pointing out the objects which they denote. In spite of the apparent obviousness of this method, it is beset by difficulties. Firstly, as we saw in Chapter 1, verbs, adjectives and prepositions are not open to this definitional method, to name only the lexical categories most familiar from English: if you point at a black cat running along a wall, you are pointing at a cat, not at 'black', 'running' or 'along'. Secondly, even in the case of objects, ostensive definition is extremely problematic. To illustrate this, imagine the following situation. You are in an optometrist's shop in France, trying to buy a new pair of sunglasses. You speak a little French, but are confused by the fact that the shop assistant continually refers to something called a [vɛʁ]. You ask what this word means, and in reply, the shop assistant taps several times with his index finger on the lens of the pair of sunglasses he is holding. This is a canonical instance of ostensive definition: the meaning of a word has been defined by indicating the object to which it refers. But exactly what part of the pair of glasses is being indicated? Is it the whole thing? In that case [vɛʁ] must mean 'glasses'. Or is it just the lens as distinct from the frame, in which case [vɛʁ] will mean 'lens'? If so, does it mean 'glasses lens' *and* 'camera lens' *and* 'contact lens', or only the first? But perhaps [vɛʁ] only refers to the *particular type of tinted, nonreflective sunglasses lens* which the shop assistant is holding: perhaps other lenses, with different shapes, compositions or functions, have different names. Or does [vɛʁ] refer to neither the lens nor the frame proper, but simply to the front, most visible part of the glasses, the lenses and those parts of the frame which are in contact with the front of the face?

QUESTION   Would it be possible to eliminate these uncertainties purely ostensively? If so, how? If not, why not?

None of these questions can, in fact, be settled by ostensive definition: every attempt to make the definition more precise ostensively would give rise to a new set of questions. Although it is an appealing idea that meanings can be defined simply by pointing at objects in the world, in practice this definitional method would seem to give rise to too many ambiguities to be viable.

   The only way to overcome the problems of ostensive definition would seem to be to use language itself as the medium in which definitions can be phrased: only this way, apparently, can we get the level of definitional precision we need. There are several ways in which this can be done. We will discuss **definition by synonymy,** by **context** and **typical exemplar,** and **by genus and differentia.**

2.3.3 Definition by synonymy

We might try, for example, to define words by providing synonyms, in either the same language as the word being defined or in a different one. Thus, one could give *mad* and *furious* as English definitions of *angry*, and *kulu* as a Warlpiri one. The problem with this strategy is that it is usually possible to challenge the identity between the **definiens** (the metalanguage word proposed as the definition; Latin 'defin*ing*') and the **definiendum** (the object language word for which a definition is required; Latin 'needing *to be defined*'). Thus, one could object that neither *mad* nor *furious* is really synonymous with *angry*, since *mad* also means 'insane', which *angry* does not, and since *furious* actually means something like '*very* angry' (similar problems arise for other proposed synonyms, such as *cross*, *livid*, *irate*, *enraged*, etc.). Similarly, although Warlpiri *kulu* does often translate English *angry*, it has a whole range of other meanings, including 'mean' and 'fight'*,* which do not correspond to those of *angry*:

(23) *Wati-lpa*   **kulu**-*wita-wangu*   *nyina-ja*.
     man-then   mean-excessively   be-PST
     There was a man who was very **mean**. (WlpD: *kulu*)

(24) *Kalaka-rna*   *nyampu-ju ngawu nyina* **kulu**-*jangka paka-rninja-warnu*.
     AUX.ADMON-1S this-1O   sick   be   fight-EL   hit-INF-ASSOC
     I might be sick like this from being hit in a **fight**. (WlpD: *langa nyiinpurupuru*)

And as (24) exemplifies, Warlpiri does not share the same system of lexical categories as English, having a single category 'nominal' which contains words translated into English as both nouns and adjectives. Consequently, many instances of *kulu* will be translated into English as nouns: as a result, the synonymy with the adjective *angry* is destroyed. Thus, the provision of synonymy fails both as an extensional and as a cognitive definitional strategy. We will return to the question of synonymy in Section 5.1.5.

QUESTION   What types of words are most easily defined through synonymy? For what words is synonymy least satisfactory as a definitional method?

2.3.4 Definition by context or typical exemplar

Another way to define a word is to situate it in a system of wider relations through which the specificity of the definiendum can be seen. This definitional strategy differs from the synonymy strategy in simply showing the position of a definiendum with respect to other related notions which are not themselves identical to it, as alleged synonyms are. A possible definition of the verb *scratch*, for example, would be 'the type of thing you do when you are itchy'. This is an example of **definition by context**: the definition identifies the event of scratching by placing it in relation to another event, being itchy, whose meaning is assumed to be already known, and

which is taken as a typical context for the definiendum. This definition only works if the definition's addressee correctly infers the intended meaning on the basis of the cue given. Thus, if, when itchy, I am in the habit of lightly striking my head against the wall, and if I believe that others do the same, then the definition will not be effective. **Definition by typical exemplar** is another example of this relational strategy: here, the definition is a list of typical examples or instances of the definiendum. If, given the German definiendum *Vogel*, I supply a list like 'swans, robins, geese, hens, magpies, etc.' and add that bats, butterflies and aeroplanes are excluded, you could correctly conclude that *Vogel* means 'bird'. And if I give jars and conserve pots as examples of the French noun *bocal*, and exclude wine bottles, you will be in a good position to infer that it means something like 'wide-necked glass container'.

QUESTION   Can definition by context or typical example be applied to lexical categories other than nouns?

QUESTION   Definition by context or by typical example are both subject to similar difficulties. What might these be?

2.3.5 Definition by genus and differentia

The two preceding types of definition are essentially relational, defining a word's meaning through its connections with other words. They may often be workable as cognitive definitional strategies, but they are unlikely to be successful as extensional definitions. This is because they leave the essential nature of the definiendum's meaning to be worked out by the definition's addressee, and as a result carry the risk that the wrong meaning may be inferred: in the case of *bocal*, for example, what is it that jars and conserve pots have in common, that makes them a *bocal*? Smallness? A wide opening? Function? The only way to convey this essential nature, apparently, is the strategy of **definition by genus and differentia**, henceforth **GD definition**, the theory of which was developed by Aristotle in the *Posterior Analytics* (Tredennick 1960: XIII.96a ff.). According to Aristotle, definition involves specifying the broader class to which the definiendum belongs (often called the definiendum's **genus**), and then showing the distinguishing feature of the definiendum (the **differentia**) which distinguishes it from the other members of this broader class. A classic example of GD definition is the definition of *man* (in the sense of 'human being') as 'rational animal'. This definition names the broader class of entities to which man belongs – animals – and specifies the distinguishing feature which picks man out from the other members of the class of animals – rationality. Needless to say, many aspects of this definition might well be contested. Nevertheless, its status as an example of definition by genus and differentia should be clear.

For many definienda, GD definition seems to be almost inevitable. Inherent in the idea of saying what something *is* seems to be the idea of saying what sort of thing it is, and what makes it different from other examples of the same sort. Often, GD definition is a useful strategy of cognitive definition.

Thus, many definitions in dictionaries explicitly or implicitly exemplify this strategy. An example is the *Concise Oxford*'s (2004) definition of the noun *keg* as 'small barrel': the definition shows the larger class to which the definiendum belongs (barrel), and specifies that it is distinguished from other members of this class by the quality of smallness. Similarly, the definition of the verb *pay* as 'give a person what is due for services done' contains the information that *paying* is a type of transfer ('give'), with the specification that it is transfer of something that 'is due for services done'.

QUESTION   Which of the following definitions contain an implicit or explicit genus-differentia structure? For those which do not, would it be possible to formulate one?

> *eerie*: gloomy and strange; weird, frightening
> *balance*: bring into or keep in equilibrium
> *shirty*: angry, annoyed
> *shine*: emit or reflect light; be bright; glow
> *round*: shaped like or approximately like a circle, sphere, or cylinder; having a convex or circular outline or surface; curved, not angular
> *under*: in or to a position lower than; below; beneath
> *wet*: soaked, covered, or dampened with water or other liquid
> *when*: at the or any time that; as soon as

There are many problem cases, however, where GD definition may be either ineffective or, simply, impossible. This is particularly so if the GD definition is intended as a cognitive definition. The reason for this is as follows. GD definition presupposes a system of categories or genera according to which definienda can be classed: defining *man* as 'rational animal' presupposes that the addressee already knows the meanings of those two terms. But there is not a large number of genera and differentiae to work with: for many words, the relevant genus will not be familiar to the definition's addressee, and hence GD definition won't be an effective strategy for a cognitive definition. Consider for example a definition of *give* as 'transfer the possession of freely' (*Concise Oxford*). The category of *transfer*, arguably, is too abstract and ambiguous to serve as an illuminating genus for *give*, and, as a result, its use in a definition of *give* may not be cognitively successful. For what is it to transfer something? One possible answer is that transferring something is *sending* it: if I transfer some money to you, I send you some money. Thus, if the definition's addressee interprets the idea of *transfer* as 'sending', then *give* will be defined as 'send the possession of freely', a formulation which does not necessarily make any sense. On the other hand, *transfer* might be interpreted as 'moving': if I transfer books from one room to another, I am moving them. On this interpretation, *give* will mean something like 'move the possession of freely', a definition which is also unsatisfactory.

These problems are less serious for extensional GD definitions, which are not concerned with ease of understandability. Consider, for example, the following definition of *feather*:

one of the light horny epidermal outgrowths that form the external covering of the body of birds and that consist of a shaft bearing on each side a series of barbs which bear barbules which in turn bear barbicels commonly ending in hooked hamuli and interlocking with the barbules of an adjacent barb to link the barbs in a continuous vane (*Webster's Ninth New Collegiate Dictionary*: *feather*; quoted in Landau 1984: 134–135)

This situates feather within the larger class of *horny epidermal outgrowth*, but the terms in which this and the differentiae are couched makes them inaccessible to anyone who lacks specialist ornithological knowledge: given this definition, it is not at all obvious that an English speaker would realize that *feather* is the word being defined.

A different kind of problem affects cognitive and extensional GD definitions equally, in those cases where it is not clear that the definiendum *does* belong to any broader class. *Self* and *time* are two possible examples.

QUESTION Try and formulate a GD definition of these words. How do you define the genera you have used?

QUESTION Can you think of other words for which a GD definition seems difficult? What causes the difficulty?

2.4 Definition and substitutability

How can the accuracy of a definition be checked? For most semantic theories, a minimum requirement on a term's definition is the following:

- **substitution of the definiens for the definiendum should be truth preserving in all contexts**.

For example, 'keep in equilibrium' can be accepted as the definition of *balance* if it is possible to substitute this phrase for *balance* in all the contexts in which *balance* occurs without rendering any of them false. All the sentences in (25), for example, remain true if 'keep in equilibrium' is substituted:

(25) *I balanced the plank on my head.*
     She balanced the ball on the end of the bat.
     Now, children, you have to balance the egg on the spoon.
     I've never managed to balance the demands of work and play.

Substituting 'keep in equilibrium' into these sentences will change their register, and the resulting utterances will often sound considerably less idiomatic and more technical (e.g. *Now, children, you have to keep the egg in equilibrium on the spoon*). Nevertheless, the fact that the sentences remain true is taken to be a sign of the adequacy of the definition. The rationale of this requirement is the principle of **identity under substitution** articulated by the seventeenth-century German philosopher Leibniz: *eadem sunt, quae*