# Linguistic
# **Categorization**

## John R. Taylor

**OXFORD TEXTBOOKS IN LINGUISTICS**

*Series editors*
Keith Brown, Eve V. Clark, April McMahon,
Jim Miller, Lesley Milroy

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# Linguistic Categorization

## *Third edition*

John R. Taylor

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# Contents

# Preface to the third edition

The third edition of *Linguistic Categorization* represents a thorough revision of the earlier editions. A number of errors, obscurities, and stylistic infelicities of earlier editions have been removed; new material has been added throughout; a new chapter (Chapter 8) has been added; the contents of Chapter 14 of the second edition have been repositioned elsewhere; bibliographical references have been updated; and each chapter has been supplemented by study questions and suggestions for further reading.

J. R. T.

# Typographical conventions

Linguistic forms are printed in italics: *dog*

Meanings of linguistic forms, and glosses of foreign language forms, are given between double quotes: "dog"

Citations are marked by single quotes.

Names of categories are printed in small capitals: DOG

Phonetic and semantic features are printed in small capitals enclosed in square brackets: [VOCALIC], [ANIMAL]

Semantic attributes are printed in normal type enclosed in square brackets: [ability to fly]

Phonemes, and phonemic transcriptions, are enclosed in slashes //

Phonetic symbols and phonetic transcriptions are enclosed in square brackets [ ]

An asterisk * indicates that a following linguistic expression is unacceptable, on either semantic or syntactic grounds. Expressions of questionable acceptability are preceded by a question mark.

**Bold-face** is used for the first appearance of technical terms.

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# Introduction and Overview

All living creatures, even the lowliest, possess the ability to categorize. In order to survive, a creature has to be able, at the very least, to distinguish what is edible from what is inedible, what is benign from what is harmful. And in order to mate and reproduce, a creature must be able to recognize its own kind.

Strictly speaking, every entity and every situation that we encounter is uniquely different from every other. In order to function in the world, all creatures, including humans, need to be able to group different entities together as instances of the same kind. Our cognitive apparatus does this for us automatically, most of the time. We 'automatically' classify things around us as 'books', 'pencils', 'trees', 'coffee-cups', and so on. And having classified something as a 'book', 'coffee-cup', or whatever, we have access to further knowledge about the object—we know how to handle it, what we are supposed to do with it, and so on. In this way, categorization serves to reduce the complexity of the environment. For the most part, categorization seems part and parcel of perception. Seeing something, and categorizing it as, say, a pencil, seem one and the same process. And if we come across something whose categorization is not immediately evident, the experience tends to create a feeling of unease. 'Well, what *is* it?', we ask.

Human beings are categorizing creatures par excellence. Our ability to function in the complex physical and social world in which we find ourselves depends on elaborate categorizations of things, processes, persons, institutions, and social relations. We are able to create and operate with literally tens of thousands, perhaps hundreds of thousands of categories, ranging from the extremely fine-grained to the highly general. Moreover, categorization is flexible, in that we can modify existing categories in order to accommodate new experiences, and we can create new categories whenever the need arises.

Linguists are interested in categorization for two reasons:

(i) Categorizing something very often involves naming it. In fact, the meaning of a word can often be taken to be the name of a category. To know the word *tree* is to know, amongst other things, what counts as a tree. In virtue of knowing the word, we are able to apply it correctly to anything that can

be categorized as a tree (in contrast, say, to a bush, a shrub, or an electricity pylon). To a large extent, the study of lexical semantics *is* the study of categorization. But it is not only the words of a language which denote categories. Grammatical phenomena, such as the tense of a verb, or the type of clause in which a verb occurs, may also be associated with meanings, and these meanings, likewise, can be thought of as categories. To use a verb in the past tense, or to describe a situation using a transitive clause, brings with it a certain categorization of the described state of affairs.

(ii) Second, language itself is an object of categorization. Like everything else in our environment, every linguistic utterance is a unique event. That language is able to be used as a means of communication at all rests on our ability to recognize, in the flux of language events, instances of linguistic categories—such things as phonemes, words, word classes, clause types, and so on. Thus, acoustically different sounds get categorized as instances of the same phoneme, sound-meaning relations get categorized as instances of the same word, diverse linguistic expressions get categorized as examples of the same lexical or syntactic category, such as NOUN, VERB, TRANSITIVE CLAUSE.

The title of this book, *Linguistic Categorization*, is meant to reflect this double role of categorization in the study of language. In one of its senses, the title refers to the process by which people, in using language, are categorizing their experience of the world. Whenever we use the word *dog* to refer to different animals, or describe different colour sensations by the same word, such as *red*, we are undertaking acts of categorization. Although individually different, the animals and the colours are regarded as being examples of the 'same' categories. Much of this book, therefore, is about the meanings of linguistic forms, and the categorization of the world which a knowledge of these meanings entails.

The title of the book is also to be understood to refer to the categories of language itself. Chapters 11 to 13 focus in particular on the categorization of linguistic objects. We will find that the categories of linguistic objects are structured along much the same lines as non-linguistic objects. Insights gained from the study of semantic categories such as RED and BIRD can be profitably applied to the study of linguistic categories such as PHONEME, WORD, and TRANSITIVE CLAUSE.

## Where do categories come from?

What is the basis on which two distinct entities come to be regarded as instances of the same category? We can distinguish two, radically opposed approaches.

One extreme position, that of **nominalism**, claims that sameness is merely a matter of linguistic convention; the range of entities which may be called dogs, or the set of colours that may be described as red, have in reality nothing in common but their name. We call them by the same name, simply because that is the linguistic convention. An equally extreme position is that of **realism**. Realism claims that categories like DOG and RED exist independently of language and its users, and that the words *dog* and *red* merely name these pre-existing categories. An alternative position is **conceptualism**. Conceptualism postulates that a word and the range of entities to which it may refer are mediated by a mental entity, i.e. a concept. It is in virtue of our knowledge of the concepts "dog" and "red", i.e. in virtue of our knowledge of the meanings of the words *dog* and *red*, that we are able to categorize different entities as dogs, different colours as red, and so on. Conceptualism may be given a nominalist or a realist orientation. On the one hand, we might assume that concepts simply reflect prevailing linguistic conventions. On this view, the English speaker's concepts "red" and "dog" arise through observation of how the words *red* and *dog* are conventionally used; once formed, the concepts will govern future linguistic performance. Alternatively, we might claim that concepts mirror really existing properties of the world. On this view, our concepts are not arbitrary creations of language, but constitute part of our understanding of what the world is 'really' like.

This book will take a course which is intermediate between these two positions, yet strictly speaking consonant with neither. To the extent that a language is a set of conventionalized pairings of forms and meanings, it may indeed be the case that a language imposes a set of categories on its users. That something is conventionalized, however, does not entail that it is arbitrary. The categories encoded in a language may be motivated, to varying degrees, by a number of factors—by actually existing discontinuities in the world, by the manner in which human beings interact, in a given culture, with the world, and by general cognitive processes of concept formation. It is precisely the dialectic of convention and motivation which gives rise to the fact that the categories encoded in one language do not always stand in a one-to-one correspondence with the categories of another language. Languages are indeed diverse with respect to the categories which they encode; yet the diversity is not unconstrained.

## Background

The theoretical background to this book is a set of principles and assumptions that have come to be known as 'cognitive linguistics'. Cognitive linguistics first emerged as a coherent theoretical approach in the mid 1980s, largely as a reaction against the excesses of 'formalist' linguistics in the Chomskyan mould. One of the main points of contention concerns the nature of linguistic

knowledge. Whereas Chomskyan linguists regard knowledge of language as an autonomous component of the mind, independent, in its essential constitution, from other kinds of knowledge and from other cognitive abilities, cognitive linguists posit an intimate, dialectic relationship between the structure and function of language on the one hand, and non-linguistic skills and knowledge on the other. Language, being at once both the creation of human cognition and an instrument in its service, is thus more likely than not to reflect, in its structure and functioning, more general cognitive abilities. One of the most important of these cognitive abilities is precisely the ability to categorize, i.e. to see sameness in diversity. A study of categorization processes is thus likely to provide valuable insights into the meanings symbolized by linguistic forms. Furthermore, there is every reason to expect that the structural categories of language itself will be analogous, in many ways, to the categories which human beings perceive in the nonlinguistic world around them.

Specifically, this book explores the implications for linguistic categorization (in both of the senses of the term) of the notion of prototype categories. The basic idea—supported by ample empirical evidence—is that categories are structured around 'prototypical instances', or 'best examples' of the category. It follows that categories have an internal structure—some members are better examples than others. Moreover, it is often the case that categories have no clear boundaries. There may be borderline cases, where clear, unambiguous categorization is not possible. Thus, an entity may be a marginal example of more than one category, but a good example of none.

## Overview

This book is structured as follows. Chapter 1 introduces some basic issues for the study of categorization on the example of colour categories. Chapter 2 surveys the 'classical' model of categories, according to which categories are defined in terms of a set of necessary and sufficient conditions. Some problematic aspects of this approach are reviewed. Chapters 3 and 4 introduce the alternative prototype view. Chapter 5 emphasizes the grounding of categories in our knowledge and beliefs about the world, and promotes an essentially encyclopaedic view of linguistic meaning.

Chapter 6 broaches the topic of polysemy—the fact that most words in a language have more than one semantic value. The various meanings of a word constitute a special kind of category, namely, a family resemblance, or radial category. Chapter 7 addresses two of the principal means whereby words can acquire additional meanings, namely metonymy and metaphor. Chapter 8 returns to the question of polysemy, and asks whether it is indeed possible in all cases to neatly enumerate the different meanings of a word. Chapter 9 extends the study beyond the meanings of words and examines the meanings

of more 'grammatical' categories, such as the diminutive and the past tense, while Chapter 10 addresses the semantic aspects of intonation categories.

Chapters 11–13 turn to the categories of language itself—words and word classes (Chapter 11), syntactic constructions (Chapter 12), and phonological categories (Chapter 13). The topic of the final chapter is acquisition, where particular attention is paid to the acquisition of some of the categories discussed in earlier chapters of the book.

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CHAPTER 1

# The Categorization of Colour

As pointed out in the Introduction, linguistics is concerned with categorization on two levels. On the one hand, linguists need categories in order to describe the object of investigation. In this, linguists proceed just like practitioners of any other discipline. The noises that people make are categorized as linguistic or non-linguistic noises; linguistic noises are categorized as instances of a particular language, or of a dialect of a particular language; sentences are categorized as grammatical or ungrammatical; words are categorized as nouns or verbs; sequences of words are categorized as examples of syntactic constructions; sound segments are classified as vowels or consonants, stops or fricatives, and so on.

But linguists need to be concerned with categorization at another level. Many of the things that linguists study—words, morphemes, syntactic structures, intonation patterns—not only constitute categories in themselves, they also stand for categories. The phonetic form [ɹed] can not only be categorized as, variously, an English word, an adjective, a syllable with a consonant-vowel-consonant structure; [ɹed] is used by English speakers to designate a range of physically and perceptually distinct properties of the real world (more precisely, a range of distinct colour sensations caused by the real-world properties) and assigns this range of colours to the category RED. Likewise, the morphosyntactic category PAST TENSE (usually) categorizes states of affairs with respect to their anteriority to the moment of speaking; the preposition

*on* (in some of its uses) categorizes the relationship between entities as one of contact and support, and so on.

Both in its methodology and in its substance, then, linguistics is intimately concerned with categorization. The point has been made by Labov (1973: 342): 'If linguistics can be said to be any one thing it is the study of categories: that is, the study of how language translates meaning into sound through the categorization of reality into discrete units and sets of units.' Questions like: Do categories have any basis in the real world or are they merely constructs of the human mind? What is their internal structure? How are categories learnt? How do people go about assigning entities to a category? What kinds of relationships exist amongst categories? must inevitably be of vital importance to linguists. Labov, in the passage just referred to, goes on to point out that categorization 'is such a fundamental and obvious part of linguistic activity that the properties of categories are normally assumed rather than studied'. In recent years, however, research in the cognitive sciences, especially cognitive psychology, has forced linguists to make explicit, and in some cases to rethink, their assumptions. In this first chapter, I will introduce some of the issues involved, taking as my cue the linguistic categorization of colour.

## 1.1  Why colour terms?

There are good reasons for starting with colour terms. In many respects colour terminology provides an ideal testing ground for theories of categorization. It is sometimes asserted—by linguists, anthropologists, and others—that categories have neither a real-world nor a perceptual base. Reality is merely a diffuse continuum, and our categorization of it is ultimately a matter of convention, i.e. of learning. Benjamin Lee Whorf stated this view in the following well-known and often-cited passage:

The categories and types that we isolate from the world of phenomena we do not find there because they stare every observer in the face; on the contrary, the world is presented in a kaleidoscopic flux of impressions which has to be organized by our minds—and this means largely by the linguistic systems in our minds. We cut up nature, organize it into concepts, and ascribe significances as we do, largely because we are parties to an agreement to organize it in this way—an agreement that holds throughout our speech community and is codified in the patterns of our language. (Whorf 1956 [1940], 213–14)

This view was echoed by the anthropologist, Edmund Leach:

I postulate that the physical and social environment of a young child is perceived as a continuum. It does not contain any intrinsically separate 'things'. The child, in due course, is taught to impose upon this environment a kind of discriminating grid which serves to distinguish the world as being composed of a large number of separate things, each labelled with a name. This world is a representation of our

language categories, not vice versa. Because my mother tongue is English, it seems self evident that bushes and trees are different kinds of things. I would not think this unless I had been taught that it was the case. (Leach 1964: 34)

According to Whorf and Leach, then, the categories that we perceive in the world are not objectively there. Rather, they have been imposed upon us by the categories encoded in the language that we happen to have been brought up with. If categorization is dependent on language, in the way suggested, it is only to be expected that different languages will encode different categorizations, none of them intrinsically any better founded, or more 'correct', than any other.

Intuitively, we would probably want to reject, on common-sense grounds, the idea that *all* categories are merely learnt cultural artefacts, the product of our language, with no objective basis in reality. Surely, the world does contain discrete nameable entities, and in many cases there does seem to be a natural basis for grouping these entities into discrete categories. Tables are one kind of thing, distinct from chairs; elephants are another, and quite different from giraffes. Research on language acquisition (see Keil 1989; Bloom 2000) has shown that even very young children, whose knowledge of linguistic conventions is still rudimentary, show a disposition to recognize tables and chairs, elephants and giraffes as different kinds of things, not as indistinct regions in a 'kaleidoscopic flux of impressions'.

Whatever the situation regarding artefacts such as tables and chairs, and natural kinds such as elephants and giraffes, there is one area of experience where the reality-as-a-continuum hypothesis would seem to hold, and this is colour. It has been estimated that the human eye can discriminate no fewer than 7.5 million just noticeable colour differences (Brown and Lenneberg 1954). This vast range of distinguishable colours constitutes a three-dimensional continuum, defined by the parameters of hue (the wavelength of reflected light), luminosity (the amount of light reflected), and saturation (freedom from dilution with white). Because each of these dimensions constitutes a smooth continuum, there is no physical basis for the demarcation of discrete colour categories. Yet people do recognize discrete categories. It follows—so the argument goes—that these categories are a product of a learning experience, more particularly, of language. This view is supported by the fact that languages can differ very considerably, both with regard to the number of colour terms they possess, and with regard to the range of colours that these terms denote.

There are some well-known examples of non-correspondence of colour terms in different languages (Lyons 1968: 56f.). Russian has no single word for blue; *goluboy* "light, pale blue" and *siniy* "dark, bright blue" are different colours, not different shades of the same colour. *Brown* has no single equivalent in French; the range of colours denoted by *brown* would be described in French as *brun*, *marron*, even *jaune*. Welsh *glas* translates into English as *blue,*

*green*, or even *grey*. Very often, it is not just an individual colour term which does not have an exact equivalent in another language. Rather, it is the set of colour terms as a whole which fails to correspond with that of another language. Bantu languages are on the whole rather poor in colour terms; the Southern African language Tsonga, for instance, has only seven basic colour terms.[1] These, with their approximate range of English equivalents, are as follows:

(**1**)  ntima: black
     rikuma: grey
     basa: white, beige
     tshwuka: red, pink, purple
     xitshopana: yellow, orange
     rihlaza: green, blue
     ribungu: dark brown, dull yellowish-brown

Tsonga divides the black-grey-white dimension in essentially the same way as English. However, only three categories are recognized in the hue dimension (*tshwuka*, *xitshopana*, *rihlaza*), whereas English has at least six (*purple*, *red*, *orange*, *yellow*, *green*, *blue*). *Ribungu*, on the other hand, is a special word for colours of low luminosity in the yellow-orange-brown region. Neither do we need go to non-European languages to find cases of extensive non-correspondence with English terms. Older European languages typically had rather restricted colour vocabularies, which contrast strikingly with the modern English system. Consider the colour terms in Classical Latin (André 1949):

(**2**)  albus: white
     candidus: brilliant, bright white
     ater: black
     niger: shiny black
     ruber: red, pink, purple, orange, some shades of brown
     flavus: yellow, light brown, golden red
     viridis: green
     caeruleus: blue

We find here, as in Tsonga, a rather restricted range of terms for the hue dimension. On the other hand, Latin made a distinction, lacking in English, between blacks and whites of high and low luminosity.

Linguists have not been slow to recognize the theoretical significance of colour terminology. Consider the following passage from Bloomfield's classic volume *Language*:

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[1]  The notion of basic colour term will be elaborated later, in s. 1.3. In addition to their basic colour terms, both Tsonga and Classical Latin (to be discussed below) have a large number of non-basic terms which denote quite precisely the colours characteristically associated with particular kinds of entities.

Physicists view the color-spectrum as a continuous scale of light-waves of different lengths, ranging from 40 to 72 hundred-thousandths of a millimetre, but languages mark off different parts of this scale quite arbitrarily and without precise limits, in the meanings of such color-names as *violet*, *blue*, *green*, *yellow*, *orange*, *red*, and the color-names of different languages do not embrace the same gradations. (Bloomfield 1933: 140)

This passage by Bloomfield could have been the model for Gleason's treatment of the same topic in his once very influential *Introduction to Descriptive Linguistics*:

Consider a rainbow or a spectrum from a prism. There is a continuous gradation of color from one end to the other. That is, at any point there is only a small difference in the colors immediately adjacent at either side. Yet an American describing it will list the hues as *red*, *orange*, *yellow*, *green*, *blue*, *purple*, or something of the kind. The continuous gradation of color which exists in nature is represented in language by a series of discrete categories. . . . There is nothing inherent either in the spectrum or the human perception of it which would compel its division in this way. The specific method of division is part of the structure of English. (Gleason 1955: 4)

Other statements in the same vein could be quoted from other scholars. Indeed, many textbooks and surveys of linguistic theory (the present work is no exception) have an obligatory paragraph, even a whole section or chapter, devoted to colour.

   I would like to draw attention to one important detail in the passage from Bloomfield, namely the assertion that colour categorization is *arbitrary*. Gleason, a few pages after the above quotation, makes the same point. What is more, Gleason puts his discussion of colour in the very first chapter of his textbook, as if to suggest that the arbitrariness of colour terms is paradigmatic for the arbitrariness of language as a whole. The arbitrariness of colour terms follows from the facts outlined above, namely the physical continuity of the colour space, and the human ability to make an incredibly large number of perceptual discriminations. There are, no doubt, other areas of experience which, like colour, constitute a smooth continuum: length, height, temperature, speed, perhaps even emotions like love, hatred, anger. Human beings can also make a large number of perceptual discriminations in these domains (but presumably nothing like the alleged 7.5 million colour discriminations). Languages are typically rather poor in their categorization of these domains. For length, English has only two terms, *long* and *short*. Colour, with its rich and language-specific terminology, is indeed an ideal hunting ground for anyone wishing to argue the arbitrariness of linguistic categories.

## 1.2  Arbitrariness

Arbitrariness, as I have used the term in the preceding paragraph, has been a fundamental concept in twentieth-century linguistics. Its status as a

quasi-technical term goes back to Saussure, who, in his *Cours de linguistique générale* (1916) proclaimed as a first principle of linguistic description that 'the linguistic sign is arbitrary': 'le signe linguistique est arbitraire' (Saussure 1964: 100).

The linguistic sign, for Saussure, is the association of a form (or signifier) with a meaning (or signified). There are two respects in which the linguistic sign is arbitrary (Culler 1976: 19ff.). In the first place, the association of a particular form with a particular meaning is arbitrary. There is no reason (other than convention) why the phonetic form [ɹed] should be associated with the meaning "red" in English; any other phonetic form, provided it was accepted by the generality of English speakers, would do equally well. It is therefore to be expected that different languages will associate a particular meaning with quite different phonetic forms; were the relationship not arbitrary, words with the same meaning in different languages would all have a recognizably similar form. With this characterization of arbitrariness, few would disagree.[2] But there is another, more subtle aspect to arbitrariness, as Saussure conceived it. This is that the signified itself—the meaning associated with a linguistic form—is arbitrary. Saussure vigorously denied that there are pre-existing meanings (such as "red", "orange", etc.), which are there, independent of language, waiting to be named. The lexicon of a language is not a nomenclature for some universally valid inventory of concepts. There is no reason, therefore, why any portion of the colour space should have a privileged status for being categorized in the colour vocabulary of a language; indeed, strictly speaking, there is no reason why colour should be lexicalized at all. We return, then, to the topic of Section 1.1. Reality is a diffuse continuum, and our categorization of it is merely an artefact of culture and language.

The arbitrariness of the linguistic sign is closely linked to another Saussurian principle, namely the notion of language as a self-contained, autonomous system. 'La langue', according to Saussure, 'est un système dont tous les termes sont solidaires et où la valeur de l'un ne résulte que de la présence simultanée des autres' (1964: 159).[3] The meaning of a linguistic sign is not a fixed property of the linguistic sign considered in and of itself; rather, meaning is a function of the value of the sign within the sign system which constitutes a language. Thus concepts, i.e. the values associated with linguistic signs, are purely differential; they are defined 'non pas positivement par leur contenu, mais négativement par leurs rapports avec les autres termes du système'

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[2] The doctrine of the arbitrariness of the signifier–signified relationship disregards, of course, the relatively rare phenomena of onomatopoeia and sound symbolism. Rhodes and Lawler (1981) have, however, suggested that the phonetic motivation of the signifier might be much more extensive than is traditionally believed.

[3] In the translation of Roy Harris (1983: 113): 'A language is a system in which all the elements fit together, and in which the value of any one element depends on the simultaneous coexistence of all the others'.

(p. 162).[4] This means that while the word *red* is obviously used by speakers of English to refer to properties of the world, and might well evoke in the mind of a speaker a mental image of the concept "red", the meaning of the word is not given by any properties of the world, nor does it reflect any act of non-linguistic cognition on the part of a speaker. The meaning of *red* results from the value of the word within the system (more precisely, the subsystem) of English colour vocabulary. In other words, *red* gets its value in virtue of a contrast with other colour terms, such as *yellow*, *blue*, and *green*. Moreover, the fact that English possesses words like *orange, pink*, and *purple* effectively limits the semantic value of *red* in contrast with, say, Tsonga, which has only one word for the red-pink-purple area of the spectrum. We might suppose that if English were to acquire a new colour term, or if one of the existing colour terms were to fall into disuse, the whole subsystem would be restructured, and each term in the subsystem would acquire a new value.

There are a number of implications for the study of colour terms which follow from the **structuralist** approach to word meaning. Amongst these are the following:

(*a*)  All colour terms in a system have equal status. To be sure, some colour terms might be used more frequently than others, but since the value of any one term is determined by its relation to all the other terms in the system, no one term can have a privileged status.

(*b*)  All referents of a colour term have equal status. Admittedly, the structuralist view does allow for the possibility of boundary colours. Recall the earlier quotation from Bloomfield, in which it is stated that languages mark off different parts of the colour space 'without precise limits'. There will be regions between adjacent colour categories where unambiguous categorization will be difficult. Discounting such marginal cases, the structuralist view assigns to each exemplar of a colour category equal status within that category. If two colours are both categorized as red, i.e. as the same colour, then, from the point of view of the language, there can be no sense in which one is redder than the other. This does not mean that an English speaker cannot perceive any difference between the two colours, only that for the purposes of linguistic categorization the difference is ignored.

(*c*)  The only legitimate object of linguistic study is the language system, not individual terms in a system, nor indeed the referents of the individual terms, that is, the things in the world that words are used to refer to. Neither can one legitimately compare single lexical items across different languages. Rather, one must compare entire systems, and the values of the items within those systems.

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[4] 'not positively, in terms of their content, but negatively by contrast with other terms in the same system' (Harris 1983: 115).

## **1.3**  An alternative approach: focal colours

In Sections 1.1 and 1.2 I have tried to give as objective and sympathetic an account as possible of the structuralist approach to colour terminology. I now want to present some arguments against the structuralist view. The pioneering work in this regard is *Basic Color Terms* (1969), by the linguist-anthropologists Berlin and Kay. On the basis of an investigation of the colour terms in ninety-eight languages, Berlin and Kay state:

Our results . . . cast doubt on the commonly held belief that each language segments the three-dimensional color continuum arbitrarily and independently of each other language. It appears now that, although different languages encode in their vocabularies different *numbers* of basic color categories, a total universal inventory of exactly eleven basic color categories exists from which the eleven or fewer basic color terms of any language are always drawn. (Berlin and Kay 1969: 2)

Berlin and Kay restricted their investigation to what they called **basic colour terms**. I shall have more to say about basic level terms in Chapter 3. Here, we can content ourselves with Berlin and Kay's operational definition. Amongst the characteristics of basic colour terms, as understood by Berlin and Kay, are the following. Basic colour terms:

(*a*)  are not subsumed under other terms. *Crimson* and *scarlet* are not basic terms in English, since they are varieties of *red*. *Orange* is a basic term, since it is not subordinate to any other colour term;

(*b*)  are morphologically simple. Terms like *bluish, bluish-green*, *chocolate-coloured*, even *golden*, are excluded, since these terms are made up out of simpler units;

(*c*)  are not collocationally restricted.[5] *Blond*, which describes only hair, is not a basic colour term;

(*d*)  are of frequent use. Rare words like *puce*, and technical words like *xanthic*, are excluded.

Berlin and Kay make two especially interesting claims. The first concerns so-called **focal colours**. If people of different language backgrounds are shown a colour chart or an array of colour chips and are asked to trace the boundaries of the colour terms in their respective languages, one may get an impression of enormous cross-language variability (as well as of variability between speakers of the same language; even the same speaker might per-form differently on different occasions). Thus, two colour samples might well be categorized as the same by speakers of one language, but as different

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[5] A **collocation** is typical pattern of combination. We would say that *blond* collocates with *hair*, or that *hair* is a collocate of *blond*, and that *blond hair* is a normal collocation.

by speakers of another. If, on the other hand, people are asked to select good examples of the basic colour terms in their language, cross-language (and within-language) variability largely disappears. Although the range of colours that are designated by *red* (or its equivalent in other languages) might vary from person to person, there is a remarkable unanimity on what constitutes a 'good red'. Paying attention to the denotational range of colour terms highlights the language specificity of colour terminology; eliciting good examples of colour terms highlights what is common between languages.

By studying the focal reference of basic colour terms, Berlin and Kay were able to make their second, and somewhat more controversial claim. They noted that the ninety-eight languages in their survey appeared to select their basic colour terms from an inventory of only eleven focal colours. Furthermore, the languages did not select randomly from this inventory. In the rare situation of a language having only two colour terms (no language, apparently, has fewer than two), these will designate focal black and focal white. If there is a third term, this will always be red. The fourth term will be either yellow or green, while the fifth will be the other member of the pair yellow and green. The sixth term will be blue, and the seventh, brown. The remaining four colours (grey, orange, purple, and pink) do not show any special ordering. These generalizations may be expressed in the form of an **implicational hierarchy**:

(**3**)

|  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|
| black |  | yellow |  |  |  |  | grey orange |
| | < red < | | < blue < brown < | | | | |
| white |  | green |  |  |  |  | purple pink |
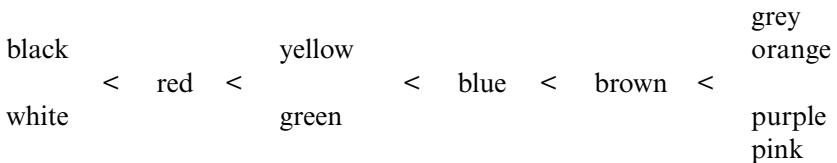
(3) is to be interpreted as follows: the existence in a language of a category to the right of an arrow implies the existence of all the categories to its left; the reverse implication does not hold. If a language has a colour term designating focal blue, we can predict that the language will also possess the five colour terms to the left of blue; we cannot, however, predict whether it will have the colour terms to the right.

Both in its methodology and substance, Berlin and Kay's work is not immune to criticism; see, for example, McNeill (1972) and Sampson (1980*b*: 96ff.). Thus, for twenty of the languages investigated, Berlin and Kay had access only to bilingual informants who happened to be available in the San Francisco region. The responses of these informants could well have been influenced by their knowledge of English and by their exposure to a technological culture. Even more suspect are the data for the remaining seventy-eight languages in the survey; these were gleaned from dictionaries, anthropologists'

reports (some dating from the 19th century), and oral reports from field-workers. No doubt, these deficiencies are part of the price one has to pay for a study of such breadth and generality as Berlin and Kay's. Even so, before we can discuss the linguistic implications of Berlin and Kay's work, it is necessary to see whether their basic insights concerning focal colours stand up to more rigorous experimental testing. With this in mind, let us turn to the work on colour terms conducted in the early 1970s by the cognitive psychologist Eleanor Rosch (published under her former name, Eleanor Heider).

Heider (1972) reports four experiments which both confirm and elaborate some of Berlin and Kay's claims. The first experiment tested the stability of focal colours across languages. It was found that when subjects from eleven different language backgrounds were asked to pick out good examples of the colour terms in their respective languages, there was indeed a high degree of agreement concerning which colours were selected. When asked to point to a good example of *red* (or its equivalent in other languages), subjects tended to pick out the same shade, irrespective of their native language. The second experiment investigated some of the behavioural correlates of colour focality. Subjects from twenty-three language backgrounds were presented with samples of focal and non-focal colours, which they were asked to name. Subjects responded in their native language, and it was found that focal colours were named more rapidly, and that the names given to focal colours were shorter (when written out, the names contained fewer letters) than was the case with non-focal colours. This strongly suggests that focal colours are perceptually and cognitively more salient than non-focal colours.

Experiment three was a short-term memory task. Subjects were shown a colour sample for a period of five seconds. Then, after an interval of thirty seconds, they had to identify from an array of colours the colour that they had just seen. At issue was whether focal colours would be recognized more rapidly and more accurately than non-focal colours. Two groups of subjects participated in this experiment. One group consisted of twenty native speakers of English. The other was made up of twenty-one monolingual speakers of Dani. The Dani are a Stone Age people of New Guinea, whose language is one of the very few in the world which have only two colour terms. Between them, these two terms categorize the whole of the colour space, *mola* referring both to focal white and to warm colours (red, orange, yellow, pink, purple), while *mili* designates focal black and cool colours (blue, green). It was found that, overall, the English speakers could recognize the colours they had seen more accurately than the Dani. This suggests that colour memory is indeed aided by the existence of the relevant colour terms in one's language. (Another possibility is that a technologically primitive culture, in which such things as traffic lights and colour-coded electric wires are unknown, provides little practice and few incentives for the memorization of colours.) More interesting was the finding that although the Dani's overall performance was poorer than that of the English speakers, they nevertheless performed better on the focal

than on the non-focal colours. In this respect, the Dani did not differ at all from the English speakers. This aspect of the Dani's performance could not have been a consequence of the greater codability of focal colours, since their language did not possess separate lexical items for designating these colours. Additional support for this view comes from Heider's fourth experiment. Here, Dani speakers were tested for long-term colour memory in a paired-association learning task. As expected, the subjects learned names for focal colours faster than names for non-focal colours. Further evidence for the perceptual and cognitive salience of focal colours comes from Heider (1971). Here it was found that three-year-old children, who had not yet acquired the full range of English colour terms, were more attentive to focal colours than to non-focal colours; also, three- and four-year-olds were able to match focal colours better than non-focal colours.

While the evidence for focal colours is compelling, the evidence for Berlin and Kay's other claim, concerning the implicational hierarchy of focal colours, is less robust. (3) suggests that some focal colours (namely those on the left of the hierarchy) are more salient than others. Recall that in the second experiment reported in Heider (1972), focal colours could be named more rapidly than non-focal colours. Heider also noted differences in the speed with which focal colours could be named. Black was named most rapidly of all, followed by (in order of increasing delay) yellow, white, purple, blue, red, pink, brown, green, and orange. This ordering does not correlate significantly with the ordering of the colour terms in (3), neither was there any significant correlation between the implicational hierarchy and the relative salience of focal colours for the three- and four-year-old children studied in Heider (1971). Indirect evidence, whose significance is however difficult to evaluate, for the implicational hierarchy may be sought in other places. For example, position on the hierarchy tends to correlate with the productivity of certain derivational processes. Only terms at the very left of the hierarchy undergo derivation by means of the causative-inchoative suffix -en: we have the verbs (to) whiten, blacken, redden,[6] but not *(to) bluen, *yellowen, *pinken. Also, terms at the very right do not readily form abstract nouns in -ness: *purpleness, *orangeness, in contrast to whiteness, blueness, greyness. We also note a weak correlation between position on the hierarchy and frequency of usage. Data in Kučera and Francis (1967) give black and white as the most frequently used terms, followed, in order of decreasing frequency, by red, brown, blue, green, grey, yellow, pink, orange, and purple.

The empirical claims made by Berlin and Kay (1969) with regard to the implicational hierarchy are probably too strong. Firstly, the proposal that all languages in the world select from a universal inventory of just eleven focal colours may need relaxing. Russian, with words for light and dark blue, has

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[6] The verbs may mean "to become white, etc." (the **inchoative** meaning), or "to cause to become white, etc.", i.e. "to make white, etc." (the **causative** meaning).

twelve basic level terms. Arguably, some English speakers too have additional basic level terms (*mauve*, *turquoise*, etc.). We can also find languages whose inventory of colour terms does not conform to (3). Languages which do not have separate terms for blue and green, but which nevertheless have terms to the right of blue, are by no means infrequent. As may be seen from (1), Tsonga, with a term for grey, fails to conform. The same is true of Zulu. Zulu, like most Bantu languages, does not distinguish between green and blue, yet the language possesses a term for focal brown, *nsundu*. Interestingly, however, terms for green-blue—a category which Kay and McDaniel (1978) call 'grue'—often turn out to be bifocal, that is to say, the grue term refers both to focal blue *and* to focal green, rather than to one or the other of the two focal colours (or to an in-between colour). Certainly, Zulu speakers think of blue and green as different colours, and, if necessary, distinguish them formally by means of the expressions *luhlaza njengesibhakabhaka* "grue like the sky" and *luhlaza njengotshani* "grue like the grass".

The years immediately following the publication of *Basic Color Terms* saw a great deal of research on colour terminology (for a review, see Bornstein 1975). This led, amongst other things, to modifications of the implicational hierarchy (Kay 1975; Kay and McDaniel 1978). The details need not concern us here. Suffice it to say that this body of colour research presents a serious challenge to the structuralist approach to colour terminology. It is not that Berlin and Kay, or subsequent researchers, attempted to minimize the sometimes very different denotational ranges of colour terms in different languages, nor did anyone take issue with the notion of colour space as a physical continuum. But a factor was introduced which the structuralists had ignored, namely perception. It will be recalled that Gleason, in the passage cited earlier, explicitly stated that 'there is nothing inherent either in the spectrum *or the human perception of it* which would compel its division' (Gleason 1955: 4; emphasis added).

At least since the researches of Helmholz, in the middle of the nineteenth century, it has been known that colour perception begins in the retina, with the stimulation of light-sensitive cells known as rods and cones. There are three kinds of cone. These react selectively to light in the red, green, and blue regions, while the rods are activated by the brightness dimension. More recent research has studied colour processing beyond the retina. (For a summary and discussion of the implications for colour terminology, see Kay and McDaniel 1978; von Wattenwyl and Zollinger 1979.) It seems that green and red, and yellow and blue, stimulate complementary patterns of cell responses in the neural pathways between the retina and the brain. So, while it may be valid to talk of the colour spectrum as a smooth continuum, it does not follow that perception of the spectrum is equally smooth. From a perceptual point of view, it certainly does make sense to speak of an optimum red. An optimum red would be light of a wavelength which produces a maximum rate of firing in those cells which are responsive to light in the red region. Moreover, there

are good reasons why red and green, blue and yellow (as well as black and white) should be positioned towards the left of the implicational hierarchy in (3). In terms of their neurological processing, these colours constitute perceptual 'primitives', while orange and purple, and grey, pink, and brown, result from the mixing of the elemental colours (red and yellow in the case of orange, red and white in the case of pink, and so on).

Gleason, Bloomfield, and others not only leave the physiological basis of colour perception out of account, they also ignore environmental factors. Colour perception is not only a function of properties of the light waves entering the eye (Miller and Johnson-Laird 1976: 336). Just as objects are perceived to retain a constant size and shape, irrespective of their location and orientation with respect to the viewer, so the human visual system normalizes variations in the visual stimulus caused by changes in illumination of the perceived object. It might well be valid, at a certain level of theoretical abstraction, to speak of colour as a three-dimensional space. But people do not encounter colours as disembodied percepts; colours come as relatively stable properties of things. It is only in comparatively recent times, and only in technologically advanced societies, that it has been possible for a vast range of diverse colours to be applied, through industrial processing, to things. In the world of nature, things are typically associated with quite narrow segments of the colour continuum. Blood is, within a rather narrow range, red, milk is white, charcoal is black, lemons are yellow. By reversing the terms on either side of the copula, we obtain ostensive definitions of the colours: red is the colour of blood, white is the colour of milk, and so on. (Note, by the way, that many colour terms, in English and other languages, were originally names for objects. Examples from English include *pink* and *orange*, as well as *violet*, *burgundy*, and *lime*.) Also from an ecological point of view, then, it is not really surprising that colour terms should refer, primarily, to rather restricted segments of the spectrum. Equally, the cross-language stability of colour focality may well have to do with the stability of the attributes of certain kinds of things, as well as with neurological processes of perception (cf. Wierzbicka 1980*b*: 42 f.). It is along these lines, also, that we might attempt to explain the highly puzzling merging of blue and green in many languages of the world.[7] Why is it that just blue and green should coalesce into a bifocal category? Blue is, of course, the colour of the sky, and green is the colour of grass. Yet, unlike the red of blood and the yellow of lemons, the blue of the sky and the green of grass are highly variable; furthermore, the sky is not a tangible object whose surface can be touched. Blue and green thus lack the referential stability which nature provides for other focal colours, a fact which may go some way towards explaining the somewhat special status of these two categories.

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[7] Such languages are particularly frequent in Africa and the Americas, and examples have also been reported from Europe. Certain conservative dialects of southern Italy, for instance, lack a term for blue, *verde* (or its cognates) serving for both blue and green (Kristol 1980).

Given the focality of colour categories—whether this be the consequence of neurological processes of perception, of environmental factors, or of both— the structuralist account of colour terminology turns out to be seriously inadequate. Two characteristics of colour terms, in particular, are at variance with the assumptions of structuralism:

(*a*) Colour categories have a centre and a periphery. This means that, contrary to structuralist principles, members of a category do not all have the same status. A colour term denotes, first and foremost, a focal colour, and it is only through 'generalization from focal exemplars' (Heider 1971: 455) that colour terms acquire their full denotational range. Obviously, if a language has relatively few colour terms, the denotational range of each term could well expand to take in a relatively large portion of the colour space. The centre, however, will remain constant.

(*b*) Because of the primacy of focal reference, colour terms do not form a system, in the Saussurian sense. The focal reference of a colour term, e.g. *red*, is independent of whether yellow, orange, purple, etc., are lexicalized in the language. The addition of a new term, such as *orange*, might cause the total denotational range of *red* to contract, but the centre of the category will remain unchanged.

In brief, colour terminology turns out to be much less arbitrary than the structuralists maintained. Colour, far from being ideally suited to demonstrating the arbitrariness of linguistic categories, is instead 'a prime example of the influence of underlying perceptual-cognitive [and perhaps also environmental: J.R.T.] factors on the formation and reference of linguistic categories' (Heider 1971: 447).

## 1.4 Autonomous linguistics vs. cognitive linguistics

I have outlined two radically divergent approaches to colour terminology. Although we have been concerned with a minute segment of any one language (we are dealing with a dozen or so words at most), the two approaches are symptomatic of two equally divergent conceptions of the nature of language. The contrast between the two conceptions will, in its various guises, constitute one of the themes of this book. At this point, therefore, it will be appropriate to highlight the basic issues dividing the two approaches.

Structuralism maintained that the meaning of a linguistic form is determined by the language system itself. The world out there and how people interact with it, how they perceive and conceptualize it, are, in the structuralist view, extra-linguistic factors which do not impinge on the language system itself. Of course, people use language to talk about, to interpret, and to manipulate the world, but language remains a self-contained system, with its

own structure, its own constitutive principles, its own dynamics. Language, in a word, is autonomous.

With the advent of Chomsky's generative-transformational paradigm, the notion of the autonomy of language acquired a rather different sense. Language was no longer regarded as a self-contained system, independent of its users; rather, the object of investigation is a 'system of knowledge' (Chomsky 1986: 24) residing in a person's brain. In Chomsky's work, this mentalistic conception of language (which the present writer fully endorses) goes with the much more controversial claim of the modularity of mind: 'What is currently understood even in a limited way seems to me to indicate that the mind is a highly differentiated structure, with quite distinct sub-systems' (Chomsky 1980: 27). Just as the human body consists of various parts each with its own function and developmental history (liver, kidneys, eyes, etc.), so the human mind consists of components which, though inter-acting, nevertheless develop and operate independently. One such component is the language faculty. The language faculty is viewed as a computational device which generates the sentences of a language through the recursive operation of rules on structured strings of symbols, assigning to each sentence thus generated a phonetic representation and a semantic interpretation. It is the language faculty, thus understood, which determines a person's grammatical competence, i.e. linguistic competence in the narrow sense. Language is autonomous in the sense that the language faculty itself is an autonomous component of mind, in principle independent of other mental faculties. The main concern of linguistics, in the Chomskyan mould, is the study of grammatical competence, i.e. the strictly linguistic knowledge which a speaker has acquired in virtue of the properties of the language faculty.

As Chomsky is well aware, one can only maintain the thesis of the autonomy of language at the cost of extreme idealization:

The actual systems called 'languages' in ordinary discourse are undoubtedly not 'languages' in the sense of our idealizations. . . . [They] might . . . be 'impure' in the sense that they incorporate elements derived by faculties other than the language faculty. (Chomsky 1980: 28)

The 'impurity' of actual languages results from the interaction of the language faculty proper with at least two other components of mind, pragmatic competence and the conceptual system. The former has to do with 'knowledge of conditions and manner of appropriate use, in conformity with various purposes' (Chomsky 1980: 224). If grammatical competence characterizes the tool, pragmatic competence as it were determines how the tool is to be put to use. The conceptual system, on the other hand, has to do with matters of knowledge and belief; it permits us to 'perceive, and categorize, and symbolize, maybe even to reason in an elementary way' (Chomsky 1982: 20). It is, in Chomsky's view, the yoking of the conceptual system with the computational resources of the language faculty that gives human language its rich expressive

power and which makes human language qualitatively different from animal communication systems.

Where, in the Chomskyan scheme, do the facts of colour categorization that we have considered in this chapter belong, to the conceptual system, or to the language faculty? The answer most in keeping with the doctrine of modularity is: the conceptual system. This answer implies that the meanings of colour terms in a language are not, in effect, facts of language at all, in the narrow sense. Language, as a computational system for generating sentences, has nothing to do with how people conceptualize their world, how they perceive it, and how they interact with it. The issue is by no means so clear-cut, however. Chomsky allows for the possibility that 'the state of knowledge attained may itself include some kind of reference to the social nature of language' (Chomsky 1986: 18). He also concedes that it is not always an easy matter to distinguish between 'intrinsic meanings', i.e. meanings assigned by the operation of grammatical competence alone, and the interpretation given to sentences on the basis of beliefs about the world:

Knowledge of language is intimately related to other systems of knowledge and belief. When we identify and name an object, we tacitly assume that it will obey natural laws. It will not suddenly disappear, turn into something else, or behave in some other 'unnatural' way; if it does, we might conclude that we have misidentified and misnamed it. It is no easy matter to determine how our beliefs about the world of objects relate to the assignment of meanings to expressions. Indeed, it has often been argued that no principled distinction can be drawn. (Chomsky 1980: 225)

Chomsky (1986: 18) states that the blurring of the distinction between the purely linguistic and non-linguistic components of language knowledge does not give rise to 'conflicts of principle or practice' for proponents of the modularity hypothesis. In this book, I shall take the reverse position, i.e. that no distinction can, or needs to be drawn between linguistic and non-linguistic knowledge. The facts of colour categorization as manifested in the meanings of colour terms are at once both facts about human cognition *and* about human language. Informing the content of the following chapters will be a conception of language as a non-autonomous system, which hypothesizes an intimate, dialectic relationship between language on the one hand and more general cognitive faculties on the other, and which places language in the context of our interaction with our environment and with others of our species. On this view, a clean division between linguistic and non-linguistic faculties, between linguistic facts and non-linguistic facts, between a speaker's linguistic knowledge proper and his non-linguistic knowledge, between competence and performance, may prove to be both unrealistic and misleading.

Criticism of the autonomy hypothesis, both in its structuralist and generative-transformational guises, is not new. More than half a century ago, Malinowski wrote:

Can we treat language as an independent subject of study? Is there a legitimate science of words alone, of phonetics, grammar and lexicography? Or must all study of speaking lead to the treatment of linguistics as a branch of the general science of culture? . . . The distinction between *language* and *speech*, still supported by such writers as Buhler and Gardiner, but dating back to De Saussure and Wegener, will have to be dropped. Language cannot remain an independent and self-contained subject of study. (Malinowski 1937: 172)

The same point has been made by George Lakoff (1978: 274), who maintains that it is unrealistic to speak of a language faculty independent of 'sensory-motor and cognitive development, perception, memory, attention, social interaction, personality and other aspects of experience'.

Over the past couple of decades, a number of linguists who have been sceptical of the autonomy hypothesis, who believe, with Lakoff, that aspects of experience and cognition are crucially implicated in the structure and functioning of language, have given the term 'cognitive' to their approach. Since the publication, in 1987, of two landmark monographs—Langacker's *Foundations of Cognitive Grammar* and Lakoff's *Women, Fire, and Dangerous Things*—so-called 'cognitive linguistics' has established itself as a viable alternative to the Chomskyan paradigm, and indeed, at the beginning of the twenty-first century, is on the cusp of entering the mainstream.

The aim of this book is to explore some aspects of linguistic categorization, given the assumptions of the cognitive approach. Probably little of what I will have to say can be construed as decisive evidence against the autonomy hypothesis and the modularity hypothesis to which it is related. As Botha (1989) has wittily shown, the imposing intellectual construct erected by Chomsky is in a very real sense impregnable. Evidence concerning how people categorize the world through language can always be shunted off to the non-language faculties of the mind or dismissed as instances of the 'impurity' of 'actual languages', with little consequence for the autonomy of the language faculty proper. Yet differences in approach are real enough. Given the theoretical question of whether language structure needs to be explained in terms of a purely linguistic faculty or whether it is based in more general cognitive abilities, the natural starting-point, as Lakoff (1977) pointed out, is surely the null hypothesis, i.e. the assumption that there are no purely linguistic abilities at all. Only when the null hypothesis has been shown to be inadequate does the need arise to posit language-specific principles. It is obviously beyond the scope of this book to demonstrate beyond doubt the adequacy of the null hypothesis for all aspects of language. My aim is more modest—namely, to show that the null hypothesis does offer the possibility of a coherent account of a diverse range of linguistic phenomena.

## Study questions

1. Basic level colour terms. Consider Berlin and Kay's four criteria for basic level status (p. 8). Do these criteria always converge on identical results? Could there be reasons to claim that for some English speakers, *mauve*, *lavender*, and *maroon* (and perhaps some others, such as *lime*, *burgundy*, *turquoise*) have basic level status? For example, is mauve a kind of purple? Could you describe something that is a pale mauve colour as purple? What is the status of *indigo* — a term often cited as one of the seven colours of the rainbow? Consider also Robin Lakoff's (1975) claim that women tend to employ a more precise and more differentiated colour vocabulary than men. If this claim were true, women might in general possess a larger number of basic colour terms than men.

2. Cross-language comparisons. The books by Berlin and Kay (1969) and MacLaury (1995*a*) have a colour chart insert. Using this insert, test out, informally, some of the claims made in this chapter, for example, that speakers of different languages tend to agree on which colour sample is the 'best' example of "red", and that speakers of the same language might disagree on the range of colour samples that can be named by a given colour word.

3. Acquisition. Although colour is a highly salient property of things, it is remarkable that children tend to acquire colour words rather late, later, for example, than dimensional words such as *big* and *little*. Why do you think this should be the case? (If you have access to pre-school children, test them out on their knowledge of colour words.)

4. Colour terms not only designate colours as such, they frequently have emotional and figurative associations. For example, we speak of a person being in a 'black mood', of 'feeling blue' (i.e. depressed), or of being 'green with envy'. Investigate these associations, both in English and other languages. What might be the basis for these figurative associations? Do you observe similarities and differences across languages? Do you find that certain colours — for example, those towards the left of the implicational hierarchy in (3) — have richer associations than the others?

## Further reading

On colour. For a comprehensive account of colour terminology, see MacLaury (1995*a*). For an account from Wierzbicka's perspective, see Goddard (1998: ch. 5).

Important contributions to cognitive linguistics, in addition to Langacker (1987, 1990*b*, 1991, 1999) and Lakoff (1987*b*), are Lakoff and Johnson (1981, 1999) and Rudzka-Ostyn (1988). The latter volume is especially valuable for the four chapters contributed by Langacker, which offer a very accessible introduction to his linguistic theory. Textbook introductions to cognitive linguistics are Ungerer and Schmid (1996), Lee (2001), and Taylor (2002). On 'formalist' vs. 'cognitivist' linguistics, see Taylor (1996*b*: ch. 2; 2002: ch. 1).

CHAPTER 2

# The Classical Approach
# to Categorization

Chapter 1 contrasted two very different approaches to colour categorization in language. On the one hand, one can appeal to the physical continuity of colour space in support of the view that it is the language system itself that arbitrarily cuts up the colour space into discrete categories. Alternatively, one may focus on the role played by non-linguistic factors (perceptual and environmental) in the structuring of colour categories. But whichever stand-point one sympathizes with, it is clear that one can hardly base a theory of linguistic categorization on the evidence of, at most, a dozen or so lexical items in a given language. Even the most convinced structuralist must concede that a physical continuum, which contains no natural breaks for categorization (as is the case with three-dimensional colour space), is probably the exception rather than the rule. Conversely, there are going to be very few categories that have such an obviously physiological and neurological base as colours. Berlin and Kay (1969: 13) themselves observe that colour terms, and perhaps also words for some other perceptual domains like taste, smell, and noise, might be atypical of language as a whole. In the following chapters, as we extend the scope of our investigation, we shall see that many of the characteristics of colour categorization that were highlighted in Chapter 1 also, in fact, hold for

the categorization of other kinds of entity, even for the categories of linguistic structure itself. Especially important, in this respect, will be the phenomenon of focal designation. Just as the structuralists saw the arbitrariness of colour terms as symptomatic of the arbitrariness of linguistic categories in general, so for cognitive linguists colour terms are paradigmatic for the prototype structure of linguistic categories.

This, however, is to anticipate. It is necessary, first, to place the prototype approach in its proper context. We must, in other words, begin by looking at what has sometimes been referred to as the 'classical theory' of categorization (e.g. Lakoff 1987b: 5 and *passim*). It is, namely, with respect to the classical theory that cognitive linguistics claims to offer a viable and descriptively more adequate alternative. A brief overview, like that attempted in this chapter, is obviously open to criticism on several points; not only does it grossly over-simplify a vast and complex subject-matter, it also exaggerates the hegemony of the classical theory. Nevertheless, a grasp of the basic principles of the classical theory, and an appreciation of the role it has played in twentieth-century linguistics, forms the essential background for a proper understanding of the remainder of this book.

## 2.1  Aristotle

In speaking of the classical approach to categorization, I am using the term 'classical' in two senses. The approach is classical in that it goes back ulti-mately to Greek antiquity; it is classical also in that it has dominated psychology, philosophy, and linguistics (especially autonomous linguistics, both structuralist and generative) throughout much of the twentieth century.

Let us begin with Aristotle. Aristotle, as is well known, distinguished between the essence of a thing and its accidents. The **essence** is that which makes a thing what it is: essence is 'all parts immanent in things which define and indicate their individuality, and whose destruction causes the destruction of the whole' (*Metaphysics* 5.8.3, as translated in Aristotle 1933). **Accidents** are incidental properties, which play no part in determining what a thing is: '"Accident" means that which applies to something and is truly stated, but neither necessarily nor usually' (5.30.1). To take one of Aristotle's examples: the essence of man (in the sense "human being"), Aristotle states, is 'two-footed animal'; that a man might be white, or cultured, is accidental; these attributes might be true of an individual, but they are irrelevant to deter-mining whether an entity is indeed a man. For Aristotle, both the concept MAN and the meaning of the word *man* are defined by a 'formula' (*logos*) of the essence (7.5.7):

If 'man' [*anthropos*] has one meaning, let this be 'two-footed animal'. By 'has one meaning' I mean this: if X means 'man', then if anything is a man, its humanity will consist in being X. (4.4.8)

In order to be able to say that an entity 'is a man', we must know the meaning of the word *man*, which in turn means knowing the 'essence of man', and this is the property of being a two-footed animal:

If anything can be truly said to be 'man', it must be 'two-footed animal'; for this is what 'man' is intended to mean. (4.4.14–15)

Putting this into more modern terminology: To say that *X* is a *Y*, is to assign entity *X* to category *Y*. Entity *X* belongs to category *Y* in virtue of its exhibiting the 'essence' of the category. With respect to MAN, Aristotle proposed two features which define the essence of the category (and hence two features which define the meaning of the word *man*), namely [TWO-FOOTED] and [ANIMAL]. Each of these features is necessary for membership in the category; if either of them is not exhibited by an entity, then the entity is not a member of the category. Jointly, the features are sufficient; any entity which exhibits each of the defining features is *ipso facto* a member of the category. The basis assumption of the classical theory, then, is as follows:

(1) Categories are defined in terms of a conjunction of necessary and sufficient features.

Further aspects of the classical theory follow from the law of contradiction and the law of the excluded middle (*Metaphysics* 4.4). The law of contradiction states that a thing cannot both be and not be, it cannot both possess a feature and not possess it. According to the law of the excluded middle, a thing must either be or not be, it must either possess a feature or not possess it. Features, therefore, are a matter of all or nothing. A feature is either involved in the definition of a category, or it is not; an entity either possesses this feature, or it does not. It follows that a feature can take only one of two values, either [+], i.e. present, or [–], i.e., absent:

(2) Features are binary.

Since possession of a feature is a matter of either-or, an entity either belongs to a category or it does not belong to it. Hence the set of entities that belong to a category is clearly defined. A category divides the universe into two sets of entities—those that are members of the category, and those that are not. There are no ambiguous or unclear cases, no entities which 'in a way' or 'to some extent' belong to the category:

(3) Categories have clear boundaries.

Any entity which exhibits all the defining features of a category is a full member of that category; any entity which does not exhibit all the defining features is not a member. There are no degrees of membership in a category, i.e. there are no entities which are better members of the category than others. A category, in other words, lacks internal structure:

(4) All members of a category have equal status.

## 2.2  The classical approach in linguistics: phonology

One can scarcely overestimate the role that the classical model of categorization has played in mainstream twentieth-century linguistics. Not least, the highly sophisticated formalism associated with much work in phonology, syntax, and semantics rests ultimately on assumptions (1)–(4). What is more, certain influential schools within modern linguistics have elaborated the classical model by making a number of further assumptions, especially concerning the nature of the features which define the categories. Perhaps the most thoroughgoing application of the classical model has been in phonology. Indeed, it could be argued that the fortune of the classical model in syntax and semantics is due, in no small measure, to its success in phonology. And it has been in phonology that the major innovations concerning the nature of features have been made. Let us begin, then, by reviewing some important trends in modern phonology. The following discussion will be highly schematic, and many points of detail, some of them controversial, have been passed over. I certainly do not wish to imply that all phonologists have subscribed to all the principles of categorization that are set out below. It is probably true to say, however, that most have subscribed to at least some of them, in some form or other.

Phonology is the study of the sound system of a language. A basic assumption has been that the stream of speech can be exhaustively segmented into a linear sequence of phones. A major concern has been to set up, for a given language, a finite inventory of phonological categories, known as phonemes, to which these phones can be unambiguously assigned. Phonemes in turn are analysed into sets of features. The phoneme /iː/ of English—the sound of the words *see*, *seat*, etc.—can be described as a vowel which is articulated with a high front tongue position; /iː/ may thus be represented by means of the features [VOCALIC], [HIGH], and [FRONT].[1] The vowel /uː/ (as in *boot*) contrasts with /iː/ with respect to the backness of the tongue; /uː/ may thus be represented by the features [VOCALIC], [HIGH], and [BACK]. Phonemes, then, are categories defined in terms of features. The features are binary, cf. (2), i.e. they can take on only one of two values, either present or absent, [+] or [−]. Thus a phoneme is either a vowel or not a vowel, i.e. it is either [+VOCALIC] or [−VOCALIC]; a vowel is either [+HIGH] (such as /iː/ and /uː/ in English) or [−HIGH] (e.g. /e/ or /æ/). Chomsky and Halle explain why it is necessary that features be regarded as binary; the reader will readily appreciate the scholastic flavour of their argument:

In view of the fact that phonological features are classificatory devices, they are binary . . . for the natural way of indicating whether or not an item belongs to a particular category is by means of binary features. (Chomsky and Halle 1968: 297)

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[1]  I discuss below the question of the length of the vowel, symbolized by ':'.

As already mentioned, many phonologists have enriched the Aristotelian model of categories by making some further assumptions concerning features. The first of these is:

(**5**)  Features are primitive.

Phonemes, as we have seen, are decomposed into features; but features, it is assumed, are not further decomposable into more basic elements of sound structure. Features are the 'ultimate constituents', the 'atomic components' (Lass 1984: 75) of phonology.

A second, related assumption concerns the universality of features:

(**6**)  Features are universal.

By this is meant that the phoneme categories of all human languages are to be defined in terms of features drawn from a universal feature inventory. The set of universal features can be thought of as characterizing the sound-producing capabilities of humans (Chomsky and Halle 1968: 297). Perhaps the best known universal feature inventory is that proposed by Chomsky and Halle (1968: ch. 7), which developed work of Jakobson, Fant, and Halle (1951). Admittedly, the choice of features to go into the universal set has been a controversial issue. This becomes clear if the feature inventories of different scholars are compared. Disagreement on the choice of features, however, does not hide the general consensus concerning the desirability and feasibility of the goal.

The next assumption concerns the ontological status of features:

(**7**)  Features are abstract.

Features, as we have seen, can be thought of as representing the speech-producing capabilities of humans. And indeed, many of the features that have been proposed, such as [VOCALIC] and [HIGH], clearly make reference to aspects of phonation and articulation. Nevertheless the features do not directly characterize the observable facts of speech, i.e. its generation in the human vocal apparatus, its acoustic properties, or its perception by the auditory system.

A couple of examples will help to elucidate this somewhat enigmatic state of affairs. Consider the question of vowel length in English. It is well-established that the different vowels of English are associated with different inherent durations (House 1961). All other things being equal (these 'other things' include such matters as the phonetic environment of the vowel, whether the vowel is stressed or unstressed, whether the vowel occurs in an utterance-final or non-final syllable, as well as a speaker's overall speaking tempo), the [ɑː] in *bard* is longer than the [iː] in *bead*, and the [æ] in *bad* is longer than the [ɪ] in *bid*. 'Length', here, is a matter of temporal duration, measured in milliseconds; in general, low vowels tend to be longer (all other things being equal) than high vowels. A separate issue concerns the phonological distinction between a class

of 'long' vowels and a class of 'short' vowels. The long vowels are identified, not primarily on the basis of their duration (though the long vowels in general do in fact have greater duration than the short vowels), but rather on the basis of their distribution within syllables. The long vowels can occur in monosyllabic words without a following consonant, as shown in the words *bee*, *coo*, *car*, *bore*. The diphthongs are similar, as shown by *buy*, *cow*, *say*, *low*. The short vowels, however, cannot occur in this environment: */bɪ/, */kʊ/, */bæ/ are not possible words in English. The distinction, to emphasize the point once again, is not one of physical duration. Indeed, the [æ] of *bad* could well be longer than the [iː] of *beat*. The distinction is a phonological one, having to do with the distribution of two classes of vowels in English syllables. On this basis, one might propose the feature [±LONG] as relevant to the phonology of English.[2]

Now let us turn to a seemingly very different phenomenon. The phonemes /f/ and /v/ in English contrast in virtue of the fact that the former is [–VOICE] and the latter is [+VOICE]. One might suppose that the feature [VOICE] can be objectively defined, in terms of the quasi-periodic vibration of the vocal folds, which in turn results in a quasi-periodic wave form. This characterization of [VOICE] might indeed be applicable to the articulation of /f/ and /v/ in the words *ferry* and *very*. Consider, however, the words *leaf* and *leave*. We would want to say that, phonologically, the contrast between the words resides in the voicing of the final segment: /liːf/ vs. /liːv/. If, however, we examine the details of articulation of these two words, we find that while the /f/ of *leaf* is indeed voiceless, the so-called voiced /v/ may be articulated with only initial voicing, or even with no voicing at all. Voicing, considered as an articulatory phenomenon, is therefore not essential for a sound's categorization as /v/. Rather, the contrast between *leaf* and *leave* is realized in a number of other ways. For example, the /v/ might be shorter, and associated with less acoustic energy than /f/. Another striking difference is that the vowel in *leave* is perceptibly longer than in *leaf*. Thus, if *leaf* and *leave* are whispered—i.e. they are spoken voiceless throughout—the words can still be distinguished, largely on the basis of vowel length and consonant intensity. In spite of the phonetic facts, we would still wish to claim that the essence (to use Aristotle's term) of the *leaf–leave* contrast has to do with the voicing of the final consonant. The voicing feature is abstract precisely in the sense that voicing is not directly observable in the articulation or in the acoustic signal. Vowel length and consonant intensity–even though these might be important perceptual cues for the differentiation of *leaf* and *leave*–are merely accidental reflexes of the abstract voicing contrast between /f/ and /v/.

But, one might ask, why represent the contrast between *leaf* and *leave* in terms of an abstract voicing feature? Why not claim that the real, essential

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[2] Since 'long' and 'short' can refer to both physical duration and to the phonological feature, some phonologists have preferred the terms 'tense' and 'lax' for the phonological distinction in question.

difference lies in observable, concrete phenomena such as vowel length, e.g. that the vowel in *leaf is* [−LONG] while the vowel in *leave* is [+LONG], and that the voicing of the following consonant is an optional, accidental property? If we were to restrict our attention to these two words only, ignoring their status as words of English, there would indeed be no grounds for preferring the abstract account. But once we study the *leaf–leave* contrast within the English language as a whole, the picture changes considerably. The abstract account is preferred, because it makes possible economical statements about relations between categories within the language system. We already need the /f/–/v/ contrast—which in these cases is really one of voicing, and not of vowel length—to describe the difference between *fairy* and *vary*, *ferry* and *very*. Precisely the same contrast, i.e. presence or absence of voice, is needed to describe other contrasts, such as *Sue–zoo* and *thigh–thy*. These contrasts can be represented as proportional relations: /f/ is to /v/ as /s/ is to /z/; *ferry* is to *very* as *Sue* is to *zoo*; *fairy* is to *vary* as *leaf* is to *leave*. The proportional relations do not involve vowel length. The vowel length contrast between *leaf* and *leave* can be described more economically, more elegantly, as a reflex of consonant voicing.

Arguments like those sketched out above lead inevitably to an autonomous conception of phonology. Saussure himself had claimed that the material element of language, i.e. sound, is external to the language system: '[le son] n'est pour [la langue] qu'une chose secondaire, une matière qu'elle met en œuvre'[3] (Saussure 1964: 164). Phonemes are relational entities, whereby it is the relations between the categories, rather than the physical properties of the members of the categories, which establish the value of any one category within the system. The far-reaching implications of Saussure's approach were first worked out by Trubetzkoy and the Prague phonologists of the 1930s (Trubetzkoy 1939), and they have informed subsequent structuralist and generative treatments of phonology. Symptomatic is the fact that phonetics—the study of observable aspects of speech—has generally tended to be regarded more as a sub-branch of physiology, acoustics, and audiology, than as a proper branch of linguistics. Linguistics proper is concerned with the relations between categories, and the abstract features by means of which these relations can be defined. Autonomous phonology, of course, takes its place within the broader thesis of the autonomy of language. Just as autonomous linguistics distinguishes a speaker's purely linguistic knowledge from pragmatic and conceptual abilities, so autonomous phonology splits off the act of speech as an articulatory, acoustic, and perceptual event from the abstract linguistic system which is claimed to underlie the physical data.

As we have seen, abstract accounts of sound systems may bear only an indirect relationship to actual acoustic-phonetic events. Abstract accounts

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[3] "Sound is merely something ancillary, a material the language uses" (Harris 1983: 116).

cannot therefore be validated by appeal to the facts of speech alone. Their justification lies in the fact that they seem to work, that is, they make possible elegant, economical accounts of a wide range of diverse phenomena. For example, features not only define phonemes and relations between phonemes; either singly or in combination, features define sets of phonemes, sometimes known as **natural classes**. A natural class is a set of phonemes which share some common feature(s). A great deal of modern phonology has been concerned with the description of sound systems in terms of rules operating over natural classes. One such rule we have already alluded to—the lengthening of a vowel before a voiced consonant. The lengthening, in other words, occurs only before the set of sounds defined by the features [VOICE] and [CONSONANTAL]. Another example concerns the distribution of the /ŋ/ phoneme in English—the sound only occurs after vowels which are [–LONG]. Consider also plural formation. Regular plurals in English are formed by adding either /s/ or /z/ (or, in a special subclass of cases, /əz/)[4] to the noun stem. /əz/ is added if the stem-final consonant is one of /s, z, ʃ, ʒ, tʃ, dʒ/. This set of sounds may be defined by the features [CORONAL] (roughly, coronal sounds are those produced by a constriction located between the dental and palatoalveolar region of the mouth) and [STRIDENT] (those sounds exhibiting high frequency noise). Otherwise /s/ is added if the noun ends in a [–VOICE] segment, while /z/ is added if the final segment is [+VOICE]. Without natural classes and the features which define them, a process like plural formation could only be described in a very cumbersome and ad hoc way.

Phonological theory, then, has enriched the classical model of categories by introducing features which are not only binary, but also primitive, universal, and abstract. There is a further, and rather more controversial aspect, associated especially with the generative-transformational tradition:

**(8)** Features are innate.

Actually, this property follows naturally from the preceding ones. If features are abstract (i.e. they bear only an indirect relationship to the physical facts of speech), and at the same time universal (each language selects from a fixed finite inventory), and if, furthermore, linguists attribute some kind of psychological reality to their abstractions (i.e. the abstract accounts are not just an exercise in formal elegance, but aim to describe, in some sense, aspects of speakers' knowledge of their language), the problem arises how a child acquiring her mother tongue can come to have knowledge of the set of features peculiar to her language. She cannot rely only on the physical data available to her—the abstract account goes beyond the physical data. The only logically possible solution is to posit a genetically inherited knowledge of the universal inventory.

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[4]  In many British varieties of English, this ending has the form /ɪz/.

## 2.3  The classical approach in semantics

In dealing with syntactic and semantic categories, many linguists have adopted a feature approach which parallels in many respects the assumptions, and even the notation and terminology, of the phonologists. (For example, a notational convention, taken over from phonology, is the practice of writing features in small capitals and enclosing them between square brackets.) At work here is what has been called, in a different context, the 'structural analogy assumption':

This is simply the assumption, familiar from much post-Saussurian work, that we should expect that the same structural properties recur at different levels. Structural properties which are postulated as being unique to a particular level are unexpected and suspicious if unsupported by firm evidence of their unique appropriateness in that particular instance. (Anderson and Durand 1986: 3)

If the categories of phonology can be represented by features which are binary, primitive, universal, abstract, and innate, then it is only to be expected that the categories of syntax (e.g. lexical categories like NOUN, VERB, ADJECTIVE, PREPOSITION) and semantics (i.e., in the main, word meanings) can also be represented by features which are likewise binary, primitive, universal, abstract, and innate. Thus, for the lexical categories, Chomsky (1981: 48) proposed two binary features, [±N], [±V], whose four possible combinations define the four major lexical categories: nouns are [+N,−V], verbs are [−N,+V], adjectives are [+N,+V], while [−N,−V] defines the prepositions. Indeed, it is not unusual for a linguist to model a feature approach in syntax and semantics explicitly on principles already worked out in phonology. Chomsky (1965: 81), for example, introduces his account of syntactic features by a brief review of the role of features in phonology.

   We shall postpone to later chapters a discussion of syntax, and focus here on semantic categories, i.e. on word meanings. An analysis of semantic categories on lines already familiar to us from phonology has been pursued within the transformational-generative paradigm by scholars such as Katz (e.g. Katz and Fodor 1963; Katz and Postal 1964) and Bierwisch (1967, 1970); also (under the name 'componential analysis') by non-generativists such as Nida (1975) and Leech (1981). Let us illustrate with a well-known example—the word *bachelor* in the sense "man who has never married". Katz and Postal (1964: 13f.) represent the meaning of this word in terms of four semantic features, namely [HUMAN], [MALE], [ADULT], and [NEVER MARRIED]. These four features together define the essence of bachelorhood. In line with (1), any entity in the world which exhibits these four features can be correctly designated by the word *bachelor*; if any (or all) of the four features is missing, or has the wrong value—if an entity is [FEMALE] or [−ADULT]—then the entity does not qualify for bachelorhood.

A feature approach to semantic categories may be legitimized by appeal to the same kinds of argument that were used in phonology, namely, by the fact that features enable the linguist to make economical and insightful statements about the structure of a language. There are three ways in which a feature approach to semantics might pay off. Firstly, one is able to state the pro-portional relations which exist within the lexicon. The words *bachelor* and *spinster* are obviously related, just as, in a different way, the phonemes /f/ and /v/ are related. Furthermore, the relationship between *bachelor* and *spinster* parallels the way other pairs of words are related, e.g. *boy* and *girl*, *husband* and *wife*, *uncle* and *aunt*. These pairs contrast in that one member of the pair has the feature [MALE], while the other is [FEMALE]. Otherwise, the feature specifications for the two words are identical.[5] With a feature analysis we can capture other kinds of relations between words, e.g. relations of inclusion and hyponymy. The meaning of the word *man*, with the features [HUMAN], [ADULT], and [MALE], is **included** in the meaning of *bachelor*. *Man* is superordinate to *bachelor*, *bachelor* is a **hyponym**, i.e. is **subordinate** to *man*.

The second advantage is that features make it possible to define 'natural classes' of items. Thus [HUMAN] defines the class of human nouns, while [−ANIMATE] defines the class of inanimate nouns. Classes such as these are involved in the statement of **selectional restrictions**, that is, restrictions on the way words may be combined together into phrases. Not any nominal, for instance, can be made the subject (or object) of a given verb. The semantic specification of a verb needs to state the class of nominals which may function as its subject. We cannot say *\*Sincerity admires John*, since *admire* requires as its subject a nominal which is [+HUMAN]. Features also play a role in the acceptability of adjective-noun combinations. With respect to the age of something, *young* is restricted to occurring with [+ANIMATE] nouns: *young child*, *young plant*, but *\*young building*, *\*young discovery*. *New*, in contrast, requires a [−ANIMATE] noun: *new building*, *new discovery*, but *\*new child*, *\*new tree*.[6] Compound nouns behave similarly. We cannot speak of an *\*infant bachelor*, since *infant*, with the feature [−ADULT], contradicts *bachelor*, which has the feature [+ADULT].

A third justification of features is that they throw light on certain kinds of sentence meaning, and on the meaning relationships that exist among sen-

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[5] The reader will note a problem with the features [MALE] and [FEMALE]. Since we appear to be dealing with a binary contrast (a sexed creature is either one or the other), one might suppose that [FEMALE] could be eliminated from the feature inventory and replaced by [−MALE], or, conversely, that [MALE] could be eliminated and replaced by [-FEMALE]. Yet the difference between males and females does not reside in the fact that the one category possesses, or fails to possess, a defining feature of the other!

[6] The situation is, however, complicated by the fact that *new* can also be used of entities (including animates) which have 'newly arrived', or which have been 'newly created' or 'newly developed'. While *new tree* cannot refer to the age of a tree, the expression would be acceptable in the sense "newly developed hybrid", or "newly planted specimen". Similarly, a *new baby* could refer to a new addition to a family, while a company could welcome its *new employees* (who, in terms of their age, need not, of course, be 'young').

tences. To consider the first issue. Of the three sentences in (9), the first is said to be **synthetic**, the second **analytic**, while the third is **anomalous**:

**(9)** a.  This man is a bachelor.
    b.  This bachelor is a man.
    c.  This bachelor is my sister.

The truth of (9a) requires verification from facts holding in the world, i.e. the sentence is true just in case the referent of *this man* is indeed a bachelor. An analytic sentence like (9b), on the other hand, is true independent of any states of affairs in the world; its truth is guaranteed by the meanings of the words *bachelor* and *man*. Similarly, (9c) is necessarily false, not because of any facts in the world, but because of the incompatibility of the feature [FEMALE] of *sister* and [MALE] of *bachelor*.

Furthermore, features make it possible to account for certain kinds of semantic relationships between sentences. The most important of these is the relation of **entailment** (10a): *p* entails *q* if, whenever *p* is true, *q* is also true. (If *p* is not true, we can infer nothing about the truth or falsehood of *q*; conversely, if *q* is true, we can say nothing about the truth of *p*). **Synonymy** (sameness of meaning), as in (10b), can be defined as mutual entailment (*p* entails *q*, and *q* entails *p*), while **contradiction** (10c) involves a negative entailment (the truth of *p* guarantees the falsehood of *q*).

**(10)** a.  John is a bachelor.
      <u>entails</u>
      John is a man.
    b.  John is a bachelor.
      <u>entails and is entailed by</u> (i.e. is synonymous with)
      John is a man who has never married.
    c.  John is a bachelor.
      <u>contradicts</u>
      John is married.

Other aspects of sentence meaning can be explained with the help of features. Thus, the interplay of feature specifications can help account for the effects of conjoining sentences with *because* and *but*. *Because* spells out the reason for a categorization, while *but* introduces some unexpected property.

**(11)** a.  This man can't be a bachelor, because he's married.
    b.  ?This man is a bachelor, but he's married.

Kempson (1977: 3 f.) has written that an essential requirement of any semantic theory is that it should provide general principles by which to account for relationships between word meanings, such as synonymy and hyponymy, and relationships between sentence meanings, such as entailment and contradiction. Both of these aims, it would appear, can be achieved

through the adoption of a feature theory of meaning. Just as in phonology, therefore, features in a semantic theory are justified to the extent that they seem to 'work'. (We should note, however, that the data to which feature theories of meaning have been applied have rarely surpassed the *bachelor* example in sophistication.) But we can push the analogy with phonological features even further. Just as phonological features have been regarded as the minimal particles of phonology, so it has been claimed that semantic features are the ultimate, atomic constituents of which word meanings are composed, cf. (5). Katz and Postal state that a 'full analysis' of the meaning of a word involves decomposing the meaning 'into its most elementary components' (1964: 13). Bierwisch expresses a similar view, adding that the elementary components have the status of universals, cf. (6), i.e. word meanings in a particular language are composed of 'basic elements, that are true candidates for the universal set of semantic markers'[7] (Bierwisch 1967: 35). Chomsky, too, has made claims for the universality of semantic features. Just as the set of universal phonological features defines the sound-producing capabilities of humans, so the set of universal semantic features defines our cognitive capabilities:

It is important to determine the universal, language-independent constraints on semantic features–in traditional terms, the system of possible concepts. The very notion 'lexical entry' presupposes some sort of fixed, universal vocabulary in terms of which these objects are characterized, just as the notion 'phonetic representation' presupposes some sort of universal phonetic theory. It is surely our ignorance of the relevant psychological and physiological facts that makes possible the widely held belief that there is little or no a priori structure to the system of 'attainable concepts'. (Chomsky 1965: 160)

The postulation of universal semantic primitives is by no means an innovation of generative linguists. Leibniz, in the seventeenth century, proposed that there is an 'alphabet of human thought'—a set of basic conceptual building-blocks, not susceptible to further decomposition, whose combination would underlie all possible concepts in a language (cf. Wierzbicka 1980*b*: 4). Some present-day linguists working outside the generative paradigm, including Wierzbicka herself, have subscribed to a similar programme (Wierzbicka 1996). But while the parallels between phonological and semantic features are compelling, there is a fairly obvious, qualitative difference between the alleged universal phonological primitives and the putative 'building blocks of human thought'. In analysing the sound system of a language, the number of phoneme categories that need to be identified is quite small (forty-five or so in English, depending on the dialect analysed and the method of analysis); the number of universal phonological features that are required is also quite manageable (about twenty are suggested by Chomsky

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[7] In speaking of semantic markers, Bierwisch is following Katz, who recognized two kinds of semantic feature, markers and distinguishers. See below.

and Halle). In contrast, the number of semantic categories in any one language is not only immense, it is also (as shown by the constant coining of new terms) extendible, and it would seem to be unrealistic to expect to be able to reduce *all* possible word meanings in *all* human languages to a manageable, finite set of universal primitives.

Katz and Postal (1964: 14) deal with this problem by recognizing two kinds of semantic feature, which they call markers and distinguishers. **Markers**, like [HUMAN] and [MALE], 'express general semantic properties'. They enter into the analysis of very many items in the lexicon and are involved in the statement of syntactic rules and of selectional restrictions. Markers, presumably, are candidates for the set of universal primitives. **Distinguishers**, on the other hand, represent 'what is idiosyncratic about the meaning of a lexical item'. For instance, a second meaning of *bachelor* (as in *bachelor of arts*) is characterized by the marker [HUMAN] and the distinguisher [having the academic degree conferred for completing the first four years of college]. The latter is the kind of meaning component which is not exploited systematically in the language. In no way can it be regarded as primitive. Neither can it reasonably be regarded as universal, since it presupposes a very specific cultural institution, namely places of higher education and their system of conferring degrees. (The same, incidentally, applies to [NEVER MARRIED]—in Katz and Postal (1964) a marker, not a distinguisher—since this feature, too, presupposes a cultural institution, namely marriage.)

It is significant that linguists who have made extensive use of primitives, such as, more recently, Jackendoff, readily admit that the primitives rarely make up the totality of a word's meaning. Jackendoff recognizes features such as [HUMAN], [ANIMATE], [DO], [CAUSE], [BECOME] in the semantic structure of many lexical items. These, according to Jackendoff, determine the basic syntactic behaviour of words, and are therefore comparable with Katz and Postal's markers. A full definition of words, however, must appeal to other kinds of information. Consider the words *duck* and *goose*:

Both of these presumably carry features to the effect that they are animate, non-human categories of Things, that they are types of birds, perhaps types of waterfowl. But what comes next? How are they distinguished from one another? One possible factor, which clearly enters into learning the words in the first place, is how ducks and geese *look*, and how they differ in appearance. But to encode this different in binary features, say [± long neck], is patently ridiculous. . . . To put a ± sign and a pair of brackets around any old expression doesn't make it into a legitimate conceptual feature. (Jackendoff 1990: 32–3)

One might also wonder whether some of the features that have been proposed really are conceptually primitive. It could be argued that [MALE] and [FEMALE], [ANIMATE] and [INANIMATE] are not at all conceptually simple, to the extent that these notions are based in complex theories of life, gender, and sexuality. Take, as another example, the feature [CAUSE]. This has figured

prominently in the semantic analyses of Bierwisch and Jackendoff, and many others. Thus, Bierwisch (1981: 344 f.) decomposes the transitive use of *melt*, as in *x melts y*, into something like "x does z, and z causes y to go from being rigid to being liquid". Far from being a primitive notion, however, causation is a complex and differentiated concept (Lakoff and Johnson 1980: ch. 14), which emerges from our interactions with the world, and which is based in theories of how and why events happen. The point was made by John Austin. Consider the following remarks, from Austin's essay 'A plea for excuses'.

Going back into the history of a word, very often into Latin, we come back pretty commonly to pictures or models of how things happen or are done. . . . We take some very simple action, like shoving a stone, usually as done by and viewed by oneself, and use this, with the features distinguishable in it, as our model in terms of which to talk about other actions and events: and we continue to do so, scarcely realizing it, even when these other actions are pretty remote and perhaps much more interesting to us in their own right than the acts originally used in constructing the model ever were, and even when the model is really distorting the facts rather than helping us to observe them. . . . 'Causing', I suppose, was a notion taken from a man's own experience of doing simple actions, and by primitive men every event was construed in terms of this model: every event has a cause, that is, every event is an action done by somebody—if not by a man, then by a quasi-man, a spirit. When, later, events which are not actions are realized to be such, we still say that they must be 'caused', and the word snares us: we are struggling to ascribe to it a new, unanthropological meaning, yet constantly, in searching for its analysis, we unearth and incorporate the lineaments of the ancient model. (Austin 1961: 202–3)

Austin identifies a primordial notion of cause. A person shoves a stone, and the stone moves—the person 'causes' the stone to move. But when a stone moves without the agency, or without the direct agency, of a human being, what do we say then? We may still say that something caused the stone to move—but now, Austin cautions, we are using *cause* in a slightly different, extended sense, removed from the original experiential scene, but nevertheless still coloured by it. Moreover, there are many different kinds of cause, some closer to the primordial concept, some more distant. The point was argued by Dirven (1995), who shows that what we loosely call 'cause' in fact comprises a family of distinct cause concepts. Comparisons between English and two languages closely related to English, namely Dutch and German, even suggest that the construal of a situation in terms of a particular kind of cause may well be language-specific. To postulate an invariant element [CAUSE] in the semantic representations of different lexical items could therefore easily 'snare' us (to use Austin's word) into seeing identity where there is only similarity.

   To complete the analogy between semantic and phonological features, we need to consider the abstractness and innateness of semantic features, cf. (7) and (8). Just as a phonological feature like [VOICE] is not directly manifested in

the periodic vibration of the vocal cords, so, according to some, a semantic feature like [ADULT] is not to be equated with the meaning of the word *adult*, or with any of the attributes of adulthood shared by adults in the real world. Bierwisch postulates that a person's mental representation of objects and situations in the world is extraneous to the semantic structure of his language. While some 'mechanism of reference' must obviously relate word and sentence meaning to the world, the semantic features characterizing word and sentence meaning do not stand for, and are not learnable from, any 'physical properties and relations outside the human organism' (Bierwisch 1970: 181). The innateness of semantic features follows logically from this view. If features are abstract, i.e. they are not derivable from acquaintance with the world, how can the child language-learner come to have knowledge of the features defining the words of his language? For language acquisition to be possible at all, Bierwisch argues, it is necessary to assume that knowledge of the set of universal features is genetically inherited.

Bierwisch in his 1970 paper embraces a fairly extreme version of the autonomy of semantics hypothesis. Probably, adherents of the view that word and sentence meanings can be fully represented by semantic features which are abstract, primitive, universal, and innate have never constituted more than a tiny minority, even within the generative community. Certainly, many linguists, including Lyons (1977: 311 ff.), Kempson (1977: 18 ff.), and Pulman (1983: 29 ff.), have been critical of the extreme version of the hypothesis. Yet the rejection of semantic features as abstract universal primitives does not necessarily bring with it a rejection of the notion of the autonomy of semantics. What one sees, in the case of Lyons, for instance, is a reinforcement of the structuralist view of meaning as a set of relations internal to the language system. A speaker's knowledge of the world remains a factor external to the system. Developing the distinction drawn by Gottlob Frege, Lyons differentiates between the sense of a linguistic expression and its reference. Reference has to do with the designation of entities in the world. Sense, on the other hand, is the abstract linguistic meaning. For Lyons, the sense of a word is to be equated with 'the set of relations [i.e. synonymy, hyponymy, implication, incompatibility, etc.: J.R.T.] which hold between the item in question and other items in the same lexical system' (1968: 443). Sense is independent of any properties of things outside the language system itself: 'Since sense is to be defined in terms of relationships which hold between vocabulary-items, it carries with it no presuppositions about the existence of objects and properties outside the vocabulary of the language in question' (Lyons 1968: 427). The same, eminently Saussurian line has been taken by Nida:

A meaning [i.e. 'sense', as used by Frege and Lyons: J. R.T.] is not a thing in itself, but only a set of contrastive relations. . . . There is no way to determine a meaning apart from comparisons and contrasts with other meanings within the same semantic area. (Nida 1975: 151)

—and, more recently, although with different emphasis, by Cruse:

We can picture the meaning of a word as a pattern of affinities and disaffinities with all the other words in the language with which it is capable of contrasting [*sic*[8]] semantic relations in grammatical contexts. Affinities are of two kinds, syntagmatic and paradigmatic. A syntagmatic affinity is established by a capacity for normal association in an utterance: there is a syntagmatic affinity, for instance, between *dog* and *barked*, since *The dog barked* is normal . . . A syntagmatic disaffinity is revealed by a syntagmatic abnormality that does not infringe grammatical constraints, as in *?The lions are chirruping*. Paradigmatically, a semantic affinity between two grammatically identical words is the greater the more congruent their patterns of syntagmatic normality. So, for instance, *dog* and *cat* share far more normal and abnormal contexts than, say, *dog* and *lamp-post*. (Cruse 1986: 16)

Cruse's monograph is especially worthy of attention, since it is possible to detect in this work symptoms of the disintegration of the classical theory. Cruse's approach to word meaning, as the above quotation shows, is explicitly structuralist. It is also componential. Yet the components which Cruse posits are not the abstract primitives of the classical theory. The components of word meaning are, quite simply, the meanings of other words. Rather than say that [ANIMAL] is a component feature of the meaning of *dog*, Cruse claims merely that the meaning of the word *animal* is 'included', in some not clearly defined sense, in the meaning of the word *dog*. The abandonment of the abstractness dogma opens the way to the incorporation of encyclopaedic knowledge into word definitions. Cruse, in fact, explicitly states that 'any attempt to draw a line between the meaning of a word and "encyclopedic" facts concerning the extra-linguistic referents of the word would be quite arbitrary' (1986: 19). A further, significant modification of the classical theory lies in the fact that for Cruse components of word meanings do not have to have the status of necessary and sufficient conditions. Some components are indeed criterial; being an animal is essential to the meaning of *dog*. Other components are excluded; being a cat, for instance, is an excluded component of *dog*. Between these two extremes, Cruse recognizes a continuum in the manner in which the meaning of one expression participates in the meaning of another. Some components, while not criterial, are nevertheless expected. Being able to bark is one such component of *dog*. (Being unable to bark is not sufficient reason to exclude categorization as a dog.) Other components, while not excluded, are unexpected, e.g. being able to sing. (Again, ability to sing does not exclude categorization as a dog; we might be dealing with a rather unusual dog, or with a rather degraded form of singing.) Some components, on the other hand, are merely possible. Dogs come in a range of colours; being brown is a possible component of *dog*, neither criterial nor excluded, expected nor unexpected.

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[8]  Presumably, *contracting* is meant.

## 2.4 What's wrong with the classical theory?

Classical categorization has a venerable history in Western thought and is therefore not to be dismissed lightly. Classical categories capture our intuitions about 'essences'; they make possible an elegant account of the semantic relations that hold between words and between sentences; and they are able to explain the way in which word meanings can be combined into more complex expressions. Moreover, classical categories would appear to possess a very high degree of cognitive efficiency. Consider the question of what categories are *for*. Why do we categorize? As pointed out in the Introduction (p. xi), the function of categorization is to reduce the complexity of the environment. As Rosch put it, 'The task of cognitive systems is to provide maximum information with the least cognitive effort' (Rosch 1978: 28). A category is efficient to the extent that 'by knowing the category to which a thing belongs, the organism, thereby, knows as many attributes of the thing as possible' (Rosch 1975c: 197). From this perspective, the benefits of classical categories are evident. If you learn that entity *e* belongs to category *C*, you can be confident that *e* will exhibit the defining features of *C*, namely $f_1 \ldots f_n$. Learning just one fact about *e*—namely, that it is a member of *C*—gives you immediate access to a number of other facts about *e*, namely, that *e* exhibits each of the features $f_1 \ldots f_n$.

Nevertheless, as we examine the matter more closely, the supposed advantages of the classical theory turn out to be largely illusory. As hinted at in the preceding section, classical categorization may not be such a robust theory after all. In this section, I want to look at some of these deeper problems associated with the theory.

First, there are some severe epistemological[9] problems. Concretely: How do we come to know that entity *e* belongs to category *C*? If category membership is defined by a conjunction of features $f_1 \ldots f_n$, the only way to know with certainty is to check the entity for each of the features $f_1 \ldots f_n$. But, then, knowledge that *e* belongs to *C* actually brings no benefits at all. We cannot predict any further properties of *e*, which *e* will have in virtue of its belonging to *C*, since each of these properties has already been verified.

The epistemological problems can be illustrated with reference to syllogisms. The **syllogism** is a mode of argumentation that guarantees the truth of a conclusion given the truth of the premises. The following well-known example illustrates:

(**12**) a. All men are mortal.
b. Socrates is a man.
c. Therefore, Socrates is mortal.

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[9] Epistemology is concerned with the basis of knowledge.

Schematically, the example takes the following form:

(12) a′  All members of category $C$ exhibit feature $f$.
    b′  $e$ is a member of $C$.
    c′  Therefore, $e$ exhibits feature $f$.

The truth of (c′) is certainly guaranteed by the truth of (a′) and (b′). But it would be wrong to construe the syllogism as a means for arriving at a new and previously unknown truth on the basis of already known truths.

How do we know that (b′) is true, i.e. that $e$ is a member of $C$? On the classical theory, we know this because we have checked off the features of $e$ against the list of features that define $C$ and ascertained that $e$ exhibits each of the defining features. But since, by (a′), all members of $C$ exhibit feature $f$, $f$ is one of the necessary features of $C$. The conclusion (c′) tells us nothing in addition to what we already need to know in order to ascertain the truth of (b′). Far from being a procedure for acquiring a new truth, a syllogism is a tautology.

There are two ways in which the epistemological objection could be softened in order that classical categories can be truly informative, or at least, informative to a degree.

(i)  First, we might assign $e$ to $C$, not because we have checked it for each of the defining features of $C$, but because someone tells us that $e$ is a $C$. If the information is reliable, we then do indeed have access to a range of further facts about $e$. In our daily lives, we often do defer to the experts for the categorization of an entity. Whenever we buy a packaged article in the super-market, we expect the article to have been properly categorized by the label on the package and to exhibit the appropriate range of properties.

(ii)  However, in order to ascertain conclusively that $e$ belongs to $C$ it will be necessary to check off all the defining features of $C$. Sometimes, though, it may be possible to cut a few corners, so to speak. It could be the case that the features that define a category are strongly correlated, such that feature $f_1$ tends to co-occur with feature $f_2$. If an entity exhibits $f_1$, chances are that it will exhibit $f_2$, and vice versa. Alternatively, or contemporaneously, some feature, or set of features, may to all intents and purposes be unique to $C$. Observation of just one of these features, or sets of features, will be sufficient to warrant the categorization of $e$ and to enable fairly reliable predictions to be made about further properties of $e$.

In cases like these we may speak of a feature's **cue validity**. A feature $f$ has high cue validity with respect to category $C$ to the extent that the presence of $f$ alone is a reliable (though not necessarily infallible) pointer to membership in $C$. If you observe that a creature is covered with feathers, you can infer with a high degree of probability that the creature is a bird, and that it will exhibit other bird-like properties, for example, that it builds nests and has a beak.

(You may be wrong, of course; you may be looking at Papageno.) If you observe that an entity eats, breathes, defecates, and (eventually) dies, you may not infer that it is a bird. These properties (eating, breathing, etc.), although necessary, and no doubt correlated, are not unique to the category BIRD and have low cue validity with respect to the category.

The question now arises, whether the features that define the categories that we operate with are *in fact* typically correlated, and whether certain features *in fact* have high cue validity with respect to a given category. The answer to both questions has to be 'yes'. The categories that humans construct—the categories that we find useful and which, to cite Rosch again, 'provide maximum information with the least cognitive effort'—are categories with just these properties. Having feathers, having a beak, and laying eggs are features which are highly correlated and each is strongly diagnostic of the BIRD category. Or, to take a linguistic example, being able to take a past tense inflection and the present tense 3rd person singular -*s* inflection are highly correlated (in English), and each points to categorization as a verb. We can, to be sure, imagine categories which do not exhibit feature correlation and whose features, taken singly, have low cue validity. The interesting thing is that these categories would be virtually useless to us in our encounters with the world. Imagine a category defined in terms of the features [blue in colour], [weighing between 5 and 28 kilograms], and [manufactured in 1950]. The features do not correlate, each of the features has low cue validity with respect to the category, and the category does not permit any inferences to be drawn about further properties (whether expected, improbable, etc.) of its members.[10] Unless the properties of different entities tend to correlate, or are expected to correlate, there would be no reason to create the category in the first place. Similarly, there would be no reason for a phonologist to recognize a category defined in terms of the features [having two syllables], [containing /b/], and [not containing /l/]. Current phonological theory does not predict that the presence of /b/ will correlate in any interesting way with number of syllables or the non-occurrence of /l/.

A second major problem with classical categories is conceptual in nature. Recall that in order to determine whether an entity belongs to category $C$ we need to ascertain whether the entity exhibits the defining features $f_1 \ldots f_n$ of $C$. Notice, however, that each of the features $f_1 \ldots f_n$, taken singly, also defines a category. There is a category defined in terms of feature $f_1$, there is the category which consists of entities exhibiting $f_2$, and so on, up to $f_n$.

Suppose we say that [HAVING FEATHERS] is a feature of BIRD. For the feature to be usable, we need to know what a 'feather' is, what it means to 'have feathers', and how we ascertain whether an entity does indeed 'have feathers'.

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[10] Similar remarks can be made of the kinds of categories that psychologists used to use, and probably still use, in category attainment experiments, such as a category that comprises everything that is either a square or a circle and that is not green.

We shall need a set of necessary and sufficient conditions for the category FEATHER (as opposed, say, to the categories SCALE, HAIR, or FUR). If 'having feathers' is a classical category, we shall need to list the necessary and sufficient conditions for membership in that category. Having done that, we shall need to state the necessary and sufficient conditions for each of those features, and so on. We are faced with an infinite regress.

We might avoid the infinite regress if we were able to refer to a set of primitive features which are not themselves defined in terms of other features, and from which all possible categories are built up. We have seen, however, that supposedly primitive semantic features such as [CAUSE], [HUMAN], [MALE] may not in fact be conceptually primitive, but presuppose complex theories of the world and how it works. A less strong requirement would be that the features which define a category should be conceptually simpler than the category they define. Even this requirement, however, may not always be met. Consider again the status of [HAVING FEATHERS] as a defining feature of BIRD. To define BIRD in this way implies that one cannot have the bird-concept unless one has already attained the feather-concept. But it is probably not at all the case that the bird-concept rests on the prior attainment of concepts such as 'having feathers'. Rather, the notion of 'having feathers' is surely understood against our knowledge of birds. If we weren't already familiar with birds, we wouldn't know what feathers were, and what it meant for a creature to 'have feathers'.

Even more damaging for the classical theory is the fact that for many concepts, it may be questioned whether they can in principle be fully explicated in terms of other concepts, primitive or otherwise. Consider Cruse's (2000: 37) discussion of KNIFE. Cruse suggests the definition: 'an instrument with a blade and a handle used for cutting'. Although it looks reasonable enough, it will be apparent that the definition fails to distinguish knives from axes, saws, and chisels, since these latter are also instruments for cutting, and, like knives, they have a blade and a handle. It is not so much that the definition lacks a feature which will conclusively differentiate knives from all other kinds of cutting instruments. Rather, as Cruse points out, the 'blade' in question has to be 'knife-type blade', the handle a 'knife-type handle', and the cutting it is used for has to be 'cutting knife-wise'. The very circularity of these proposals is significant—it suggests that we can only understand what a knife is on the basis of real-world knowledge of knives, what they look like, what parts they consist of, and of the various 'practices' that they are used in.

What this all means, I suggest, is that we apprehend and learn categories (at least, many of them) holistically, in the context of our interaction with the world. We do not understand categories by breaking them down into their components, neither do we 'build up', or 'assemble' categories out of their defining features, of the kind that might be contained in definitions.

A final problem with classical categories is that they are actually quite hard to come by. There are surprisingly few words in everyday use that are amenable

to a classical definition. The classical categories that we do encounter usually have a special status; they are what we might call 'expert categories'. Experts of various kinds—scientists, bureaucrats, lawyers, and academics in every field of enquiry (including linguistics)—may explicitly define categories in classical terms. Take the concept ADULT. For bureaucratic purposes, an adult may be defined as a person who has reached their 18th birthday. Thus defined, ADULT constitutes a classical category. It has a clear-cut boundary and lacks internal structure—for bureaucratic purposes, all adults are adults to an equal degree. In everyday usage, however, the word *adult*—and the distinction between 'adult' and 'non-adult'—is likely to be much more fluid and understood in terms of several equally fluid properties. Age will certainly be an important, though not necessarily decisive factor. Notions of emotional and physical maturity, independence from parents, and the ability to assume civic responsibilities, may all contribute to the decision to call a young person an adult, or not yet an adult. Needless to say, the non-classical status of ADULT will be inherited by categories whose definitions make reference to this feature, such as BACHELOR.

## Study questions

1. A semantic theory needs to be able to explain relations of entailment, synonymy, contradiction, and anomaly. Explain how a classical feature-based theory might be attractive from this point of view.

2. A further requirement of a semantic theory is that it can explain how items are combined into semantically more complex expressions. How might a feature-based theory be helpful in accounting for the combination of adjectives with nouns, as in *married man*, *cold beer*, *red house*?

    Consider the following sentences. These would appear to exhibit a clash of features, and therefore ought to be semantically anomalous. They are however fully acceptable and easily interpreted. Why is this?

    The university just telephoned.
    He's a living corpse.
    Her husband is an unrepentant bachelor.
    He told me a story about a non-existent Frenchman.

3. The following sets of words all refer to articles of a similar kind. What kinds of features are needed to distinguish between the words within each set?

    seat, chair, sofa, armchair, couch, chaise longue, bench, stool, pew
    jacket, coat, trousers, shorts, shirt, blouse, cardigan, T-shirt, waistcoat
    hat, cap, bonnet
    mat, carpet, rug, runner

    What difficulties do you encounter in attempting to differentiate these words in terms of sets of binary features?

4. Negation. Consider the effects of denying that an entity belongs to a certain category. If you learn that *X* is not a bachelor, what would you likely infer about *X*? Which feature, or features, of *bachelor* is being negated? Are each of the following equally felicitous?

John isn't a bachelor. John is married.
John isn't a bachelor. John is only 10 years old.
Chris isn't a bachelor. Chris is a woman.
Macavity isn't a bachelor. Macavity is a tomcat.

5. Knives. Try to improve on Cruse's definition of *knife* as 'an instrument with a blade and a handle used for cutting', so as to differentiate the word from *axe*, *chisel*, *saw*, *scissors*, *guillotine*, etc.

6. The following sentences all contain some notion of 'cause'. To what extent do these examples provide evidence (i) against the claim that cause is a primitive conceptual feature, and (ii) for the claim that cause is a complex, differentiated concept?

I melted the ice by taking it out of the refrigerator.
I melted the ice by placing it in the microwave oven.
The ice melted because it was not put into the refrigerator.
The ice didn't melt because it was kept in the refrigerator.
The power failure caused the ice to melt.
Greenhouse gas emissions caused the ice to melt.

Do you find the following to be slightly odd? What might be the reasons for this?

The power failure melted the ice.
Greenhouse gas emissions melted the ice.

Can the following be described as examples of causation? (On the 'causative' uses of the prepositions *from*, *out of*, *through*, *at*, *of*, *over*, and *with*, see Dirven 1995.)

He collapsed from overwork.
She asked the question out of curiosity.
I failed to complete the task through lack of time.
He felt uneasy at her remark.
She died of leukaemia.
They were arguing over money.
I was in bed with the flu.

# Further reading

Statements of the classical approach in semantics may be found in Leech (1981), Katz and Fodor (1963), Katz and Postal (1964), and Bierwisch (1970).

For critical presentations of the classical approach, see Lakoff (1987*b*), Kleiber (1990), and Violi (2001).

On the relevance of Austin's writings to current issues in cognitive linguistics, see Taylor (1995*b*).

# Prototype Categories: I

Chapter 2 presented the classical theory of categories, according to which a category is defined in terms of a set of necessary and sufficient conditions for membership. The chapter also raised a number of critical issues with respect to classical categories. What is the status of the features which define a category? Are they conceptually primitive? Do all members of a category necessarily share a set of criterial properties? Are word meanings reducible to sets of primitive semantic components? What is the status of 'expected', as opposed to 'necessary' features? Is it legitimate to make a distinction between a person's linguistic and non-linguistic knowledge? Can we ever know the meaning of a word independently of our acquaintance with the relevant facts of the world? The classical theory of categorization has also been challenged by experimental work in psychology (Smith and Medin 1981). In this chapter we review some of the better-known empirical findings and introduce an alternative to the classical approach, namely categorization by prototype. We will also consider, in a preliminary fashion, the potential relevance of prototype categorization to linguistic inquiry.

## 3.1 Wittgenstein

Many of the inadequacies of the classical theory of categorization that we will review in this chapter were anticipated by Ludwig Wittgenstein in a highly significant passage in the *Philosophical Investigations* (completed by 1945). Wittgenstein addressed the question of how to define the German word *Spiel* "game". What is it about an activity that legitimizes its categorization as a 'game'? Wittgenstein notes, first of all, that the various members of the category do not share a set of common properties on whose basis games can be clearly distinguished from non-games. There are, to be sure, attributes typically associated with the category. Some members share some of these attributes, other members share other attributes. Yet there are no attributes common to all the members, and to them alone. It may even be the case that some members have practically nothing in common with others. Thus, contrary to the expectations of the classical theory, the category is not structured in terms of a set of shared criterial features, but rather by a criss-crossing network of similarities.

This state of affairs is by no means peculiar to the lexical item *game*. Arguably, the meanings of the vast majority of words in the lexicon are structured in a similar way. (For a further example, the reader is referred to the– in style and spirit very Wittgensteinian– account of the meaning of *pin* in Matthews 1979: 70 ff.) Wittgenstein used the metaphor of a family resemblance to describe the structure of GAME. Although it is very well known, it is still worth quoting the passage at length.

Consider for example the proceedings that we call 'games'. I mean board-games, card-games, ball-games, Olympic games, and so on. What is common to them all?– Don't say: 'There must be something common, or they would not be called "games"'– but *look and see* whether there is anything common to all.– For if you look at them you will not see something that is common to *all*, but similarities, relationships, and a whole series of them at that. To repeat: don't think, but look!– For example at board-games, with their multifarious relationships. Now pass to card-games; here you find many correspondences with the first group, but many common features drop out, and others appear. When we pass next to ball-games, much that is common is retained, but much is lost.– Are they all 'amusing'? Compare chess with noughts and crosses. Or is there always winning and losing, or competition between players? Think of patience. In ball games there is winning and losing; but when a child throws his ball at the wall and catches it again, this feature has disappeared. Look at the parts played by skill and luck; and at the difference between skill in chess and skill in tennis. Think now of games like ring-a-ring-a-roses; here is the element of amusement, but how many other characteristic features have disappeared! And we can go through the many, many other groups of games in the same way; we see how similarities crop up and disappear.

And the result of this examination is: we see a complicated network of similarities overlapping and criss-crossing: sometimes overall similarities, sometimes similarities of detail.

I can think of no better expression to characterise these similarities than 'family resemblances'; for the various resemblances between members of a family: build, features, colour of eyes, gait, temperament, etc. etc. overlap and criss-cross in the same way. – And I shall say: 'games' form a family. . . .

[H]ow is the concept of a game bounded? What still counts as a game and what no longer does? Can you give the boundary? No. You can *draw* one; for none has so far been drawn. (But that never troubled you before when you used the word 'game'.) (Wittgenstein 1978: 31–3)

In a subsequent passage, Wittgenstein discusses how the category might be acquired. Since GAME is not structured according to classical principles, the category cannot be learnt as a conjunction of those criterial features which uniquely distinguish games from non-games. Rather, the category has to be learnt on the basis of exemplars:

How should we explain to someone what a game is? I imagine that we should describe games to him, and we might add: 'This *and similar things* are called "games"' . (Wittgenstein 1978: 33)

In light of subsequent developments in categorization research, it is worth noting that Wittgenstein did not appear to have considered the possibility that some kinds of games might be better examples of the category than others, or that some other kinds might be quite marginal. As we shall see, these are topics that were to feature quite prominently in subsequent research.

## 3.2  Prototypes: an alternative to the classical theory

Wittgenstein's insight that the classical theory fails to predict the referential range of at least some words in everyday use received empirical confirmation in a series of experiments reported in Labov (1973). Labov studied the linguistic categorization of household receptacles like cups, mugs, bowls, and vases. His procedure was simple. Line drawings were prepared of receptacles of different shapes. These were shown to subjects, who were asked to name the depicted objects. A receptacle with a circular horizontal cross-sectional area, tapering towards the bottom, whose maximum width was equal to the depth, and which was provided with a handle, was unanimously called a cup. As the ratio of width to depth increased, more and more subjects called the object a bowl. Contrary to the expectations of classical theory, there was no clear dividing line between CUP and BOWL; rather, the one category merged gradually into the other. Removing the handle from the receptacles lowered the tendency for the depicted objects to be designated as cups, but again the effect was not clear-cut. Categorization was also affected by asking subjects to imagine the receptacles filled with different kinds of things. If filled with hot coffee, cup-responses increased, while bowl-judgements increased if the receptacles were thought of as containing mashed potatoes. Similar effects

were found if the depth, rather than the width, was increased. In this case, cup-responses gradually gave way to categorization as vases, while if the receptacles were of a cylindrical rather than a tapering shape they tended to be categorized as mugs.

There are several important conclusions that can be drawn from Labov's beautifully simple experiment. I will assume in the following discussion that entities are categorized on the basis of their **attributes**.[1] These are not the binary constructs of the classical approach. Consider the ratio of width to depth. The ratio is a continuous variable. Labov's results show that associated with each of the categories CUP, BOWL, and VASE, there is a certain optimum value, or range of values, for the width-depth ratio. In categorizing an entity, it is not a question of ascertaining whether the entity possesses this attribute or not, but how closely the dimensions of the entity approximate to the optimum value. Even the presence or absence of a handle is not, strictly speaking, a matter of either-or. One can easily imagine a range of possibilities inter-mediate between a full-fledged handle and a slight protuberance on the side of the receptacle. Secondly, attributes, far from being the abstract entities of autonomous linguistics, are properties of real-world entities which are readily accessible to competent users of a language in virtue of their acquaintance with the world around them. The attributes of cups, bowls, and vases include the characteristic shape, size, and material of the receptacle. Attributes, though, are not limited to tangible properties. Labov showed that one and the same receptacle might be categorized differently according to whether it is thought of as being used in drinking coffee or in eating mashed potatoes. In other words, attributes might sometimes be functional (they concern the use to which an object is put) or interactional (they concern the way people handle the object). Ultimately, the attributes have to do, not with inherent properties of the object itself, but with the role of the object within a particular culture, a point stressed by Wierzbicka (1985) in her commentary on Labov's work. As such, the attributes cannot reasonably be regarded as semantic primitives. Finally, it emerges very clearly from Labov's experiment that no one single attribute, or set of attributes, is essential for distinguishing the one category from the other. Presence of a handle, or function in the drinking of coffee, merely raises the probability that an entity will be categorized as a cup. Although cups typically have handles and are typically used for drinking coffee, presence of a handle and use in drinking coffee are not defining features of CUP. There are, to be sure, some attributes which *are* shared by all cups. For example, all cups are (potential) containers. Being a container cannot, however, be a defining feature of CUP, since many non-cups are also containers.

What is it, then, that makes a cup a cup, and not a bowl or a vase? What,

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[1] From now on I shall restrict the term 'feature' for the abstract features of the classical approach, reserving 'attribute' for alternative, non-classical theories of categorization.

in Aristotelian terms, is the 'essence of cup'? This question is tantalizingly difficult to answer, at least in classical terms. At the same time, we have no difficulty visualizing, or recognizing, a typical cup. Even though CUP might merge with categories like BOWL and VASE there are certain receptacles that are unanimously and uncontroversially described as cups. The analogy with colour categories will be evident. Just as certain regions of the colour spectrum count as good, even as optimal examples of RED and YELLOW, so too household receptacles appear to be categorized around good, clear exemplars of CUP, BOWL, and VASE. These **prototypes** serve as reference points for the categorization of not-so-clear instances. Prototypes contain a richness of sometimes culturally bound detail which, on a strictly Aristotelian view, would have to be regarded as accidental. Thus, the prototypical cup (in Western societies) has a handle, it is made of porcelain, and it comes with a saucer; it has a certain overall shape and a typical size; cups are used for drinking hot tea or coffee; and you often buy them in sets of six. None of these attributes is essential for membership in the category. A plastic container, with no handle and without a saucer, such as might be delivered from a coffee vending machine, is still a cup, albeit not a typical one.

Labov's experimental procedure, whereby subjects are asked to name line drawings of artefacts, has been employed by the anthropologist Willett Kempton (1981), with very similar results. The main body of Kempton's study was concerned with the categorization of ceramic vessels in rural varieties of Mexican Spanish. It was found that no one category could be defined in terms of a list of criterial, distinctive features. Rather, associated with terms like *jarro*, *jarra*, *olla*, *cazuela* was a prototype representation of a vessel (or a small range of vessels) of a specific shape, with specific characteristics (e.g. with or without a handle or spout), and which fulfilled certain functions (e.g. cooking, drinking, storage, or pouring). Each term was also used to refer to a range of nonprototypical instances, and the boundaries between the categories were fuzzy in the extreme. Perhaps the most extensive and systematic empirical exploration of prototypes, however, has been pursued by the psychologist, Eleanor Rosch. We have already encountered Rosch's work on colour categorization in Chapter 1. Rosch claimed that colour terms acquire their denotational range, not through the setting of category boundaries, but by generalization from focal (i.e. prototypical) exemplars. Subsequent research indicated that many other natural categories,[2] like FURNITURE and BIRD, are structured in a similar way.

Rosch (1973b, 1975b) studied the structure of natural categories by asking subjects to judge to what extent certain kinds of entity could be regarded

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[2] By natural categories Rosch means 'concepts designatable by words in natural languages' (Rosch 1975b: 193). Natural categories are opposed to the artificial categories, e.g. configurations of dots or sequences of letters and numbers, that are frequently used by psychologists in studies of learning and concept formation.

as good examples of a category. Rosch (1975*b*) investigated the categories FURNITURE, FRUIT, VEHICLE, WEAPON, VEGETABLE, TOOL, BIRD, SPORT, TOY, and CLOTHING. Table 3.1 reproduces the results from some 200 American college students who were asked to judge to what extent each of the sixty household items could be regarded as a good example of the category FURNITURE. Subjects responded using a 7-point scale ranging from 1 (= very good example), through 4 (= moderately good example), to 7 (= very bad example, or not an example at all). Table 3.1 lists the items according to decreasing degree of membership in the category.

**Table 3.1** Goodness-of-example ratings for sixty members of the category FURNITURE

| Member | Rank | Specific score | Member | Rank | Specific score |
|---|---|---|---|---|---|
| chair | 1.5 | 1.04 | lamp | 31 | 2.94 |
| sofa | 1.5 | 1.04 | stool | 32 | 3.13 |
| couch | 3.5 | 1.10 | hassock | 33 | 3.43 |
| table | 3.5 | 1.10 | drawers | 34 | 3.63 |
| easy chair | 5 | 1.33 | piano | 35 | 3.64 |
| dresser | 6.5 | 1.37 | cushion | 36 | 3.70 |
| rocking chair | 6.5 | 1.37 | magazine rack | 37 | 4.14 |
| coffee table | 8 | 1.38 | hi-fi | 38 | 4.25 |
| rocker | 9 | 1.42 | cupboard | 39 | 4.27 |
| love seat | 10 | 1.44 | stereo | 40 | 4.32 |
| chest of drawers | 11 | 1.48 | mirror | 41 | 4.39 |
| desk | 12 | 1.54 | television | 42 | 4.41 |
| bed | 13 | 1.58 | bar | 43 | 4.46 |
| bureau | 14 | 1.59 | shelf | 44 | 4.52 |
| davenport | 15.5 | 1.61 | rug | 45 | 5.00 |
| end table | 15.5 | 1.61 | pillow | 46 | 5.03 |
| divan | 17 | 1.70 | wastebasket | 47 | 5.34 |
| night table | 18 | 1.83 | radio | 48 | 5.37 |
| chest | 19 | 1.98 | sewing machine | 49 | 5.39 |
| cedar chest | 20 | 2.11 | stove | 50 | 5.40 |
| vanity | 21 | 2.13 | counter | 51 | 5.44 |
| bookcase | 22 | 2.15 | clock | 52 | 5.48 |
| lounge | 23 | 2.17 | drapes | 53 | 5.67 |
| chaise longue | 24 | 2.26 | refrigerator | 54 | 5.70 |
| ottoman | 25 | 2.43 | picture | 55 | 5.75 |
| footstool | 26 | 2.45 | closet | 56 | 5.95 |
| cabinet | 27 | 2.49 | vase | 57 | 6.23 |
| china closet | 28 | 2.59 | ashtray | 58 | 6.35 |
| bench | 29 | 2.77 | fan | 59 | 6.49 |
| buffet | 30 | 2.89 | telephone | 60 | 6.68 |

*Source*: Rosch 1975*b*: 229. Copyright 1975 by the American Psychological Association. Reprinted by permission of the author.

Rosch reports that statistically the order in which the items are listed in Table 3.1 is highly reliable. Even different subgroups of subjects, e.g. those who had lived predominantly on the east coast of the United States, and those who came from the west, gave comparable responses.[3] Quite obviously, subjects had found the task a meaningful one, and had not been putting random crosses on their answer sheets. This fact alone constitutes a highly significant finding. On the strictly classical view, it simply makes no sense to ask 'to what extent' a thing belongs to a category – either it belongs, or it does not belong. Think, for example, of phonology, a branch of linguistics thoroughly permeated by Aristotelian principles. Does it make sense to ask whether /aː/ is a better vowel than /iː/? (We shall see in Chapter 13 that the question does in fact make sense.) Rosch showed that degree of membership in a category, far from being meaningless, is in fact a psychologically very real notion.

A second important aspect of Rosch's results is that similar kinds of prototype effects showed up on each of the ten categories investigated. Prototype effects, that is, were insensitive to the distinction sometimes made between **natural kind categories** and **nominal kind categories**. A natural kind term like *bird* is presumed to correspond to some real phenomenon in the world, whose inner constitution determines the range of things in the category. This being the case, natural kind categories might be expected to have clear boundaries, and not to display degrees of category membership. On the other hand, nominal kind terms, like *toy* and *vehicle*, are said to be, in part at least, definable in analytic terms. Thus a toy is something that children play with, a vehicle is a means of locomotion. If analytic statements specify attributes which are necessary (if not perhaps sufficient) for membership in the category, then nominal kind terms might also be presumed to have clear boundaries and either-or membership. Neither of these expectations is valid.

In addition to establishing degree of category membership as a psychologically valid notion, Rosch also showed degree of category membership to be a relevant factor in a number of experimental paradigms. For instance, degree of membership affects verification time for statements of the kind 'An $X$ is a $Y$'. It takes less time to verify that a robin (a highly central member of the category) is a bird than to verify that a duck is a bird (Rosch 1973b).[4] The effect is more pronounced with child subjects than with adults, suggesting

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[3] In order to assess the reliability of her results, Rosch employed the split-halves correlation test. The test involves splitting the subject population arbitrarily into two halves, and correlating the overall performance of the two halves. The test is able to show whether any randomly selected sub-group of subjects is performing similarly to the rest of the group. The split-halves test does not, however, show whether individual subjects perform in a similar way to each other. Barsalou (1987) has shown that individuals do in fact differ quite a lot one from another; even the same subject may perform differently when tested on different occasions. When groups of subjects are tested, however, these individual differences tend to cancel out.

[4] Rosch's experiments were performed with American subjects. British readers are reminded that in American English, *robin* refers to a rather larger bird than the British English word.

that children have not fully assimilated the more marginal instances to the categories. Degree of membership also interacts with the effect of priming. Two words are shown on a screen, and the subject must indicate, as rapidly as possible, whether the two words are the same or different. The presentation of the two words is preceded by the presentation of a superordinate category name. For example, the word pair *chair-chair* might be preceded by *furniture*. If the test words are good examples of the category, then priming with the category name results in faster response times. If the words are poor examples of the category (e.g. *stove* as an example of *furniture*), then response time is slower. This suggests that the category name activates the names of more prototypical members of the category, and deactivates the more marginal members (Rosch 1975*b*). Particularly striking, also, is the correlation between degree of category membership and the frequency and order with which category members are named (Rosch 1973*b*). If people are asked to name exemplars of a category, they tend to mention the more prototypical members first. Data on the naming of exemplars had been obtained by Battig and Montague (1969) for fifty-six categories. When asked to list members of the categories FURNITURE, WEAPON, BIRD, and SPORT, Battig and Montague's subjects named in first place CHAIR, GUN, ROBIN, and FOOTBALL more frequently than other members. These are precisely the members to which Rosch's subjects assigned the highest degree of membership in the respective categories.

Rosch's questionnaire technique, whereby subjects are required to indicate the extent to which exemplars belong in a category, has been applied many times, with a range of category names, and the same kind of graded responses have been obtained (see Rosch 1978: 36, for references). Of special significance is the fact that prototype effects are not restricted to categories denoted by nouns. Coleman and Kay (1981) report prototype effects in the extent to which statements contained in mini-narratives count as instances of telling a lie, while Pulman (1983) found graded membership in the categories denoted by verbs such as *look*, *kill*, *speak*, and *walk*. A more abstract category, that denoted by the adjective *tall*, was investigated by Dirven and Taylor (1988), again with the same kind of results.

## 3.3  Basic level terms

Prototypicality, as studied by Rosch, is intimately bound up with what we might call the **two axes of categorization** (Fig. 3.1). A given entity may be categorized in many alternative ways. *Chair*, *piece of furniture*, *artefact*, and indeed *entity*, are all equally true ways of naming the thing I am sitting on as I write this chapter. CHAIR, FURNITURE, ARTEFACT, and ENTITY represent four levels of categorization, each more inclusive than the preceding one. The category CHAIR is included in the superordinate category FURNITURE, which in

**Fig. 3.1.** The two axes of categorization (nominal categories).
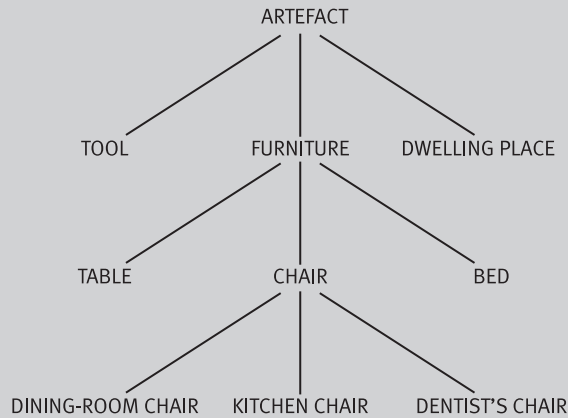


turn is included in the even higher category ARTEFACT. On the other hand, KITCHEN CHAIR is a subordinate member of the category CHAIR. These different levels of categorization are shown in Fig. 3.1 on the vertical axis. The horizontal axis represents contrasting categories which are included in the next highest category. Thus TOOL, FURNITURE, and DWELLING PLACE are all examples of ARTEFACT; TABLE, CHAIR, BED are instances of FURNITURE, while DINING-ROOM CHAIR, KITCHEN CHAIR, DENTIST´S CHAIR are instances of CHAIR. At the very lowest level of categorization would stand, not so much categories, but individual instances. 'The kitchen chair I bought last week' might be an instance of KITCHEN CHAIR. Attempts have been made to classify verbal categories in a similar way (although verbal categories turn out to be somewhat more problematic in this respect than noun categories). Figure 3.2 is based on Pulman (1983: 108).

It will be apparent that the hierarchical organization of categories, as shown in Figs 3.1 and 3.2, is compatible with the classical approach to categories, and might even be taken to constitute evidence for such an approach. Thus, as we move down the vertical axis, we would say that each category possesses exactly the features of the immediately dominating category, plus one (or more) additional distinguishing features. Items on the same level of categorization all share the features of the immediately dominating category, but each is distinguished from the other categories on the same level by the presence of a unique feature (or set of features).

The feature approach fails, however, to address two important properties of the categorization hierarchy. First, it fails to account for prototype effects; these, as we have seen, have to do with the fact that certain subordinate members of a category might be better examples of the category than others.

**Fig. 3.2.** The two axes of categorization (verbal categories).

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                        DO
               /        |         \
           MAKE       CAUSE      BECOME
                    /   |    \
                COOK   KILL    BOIL
                    /  |    \
           EXECUTE  MURDER   ASSASSINATE
```
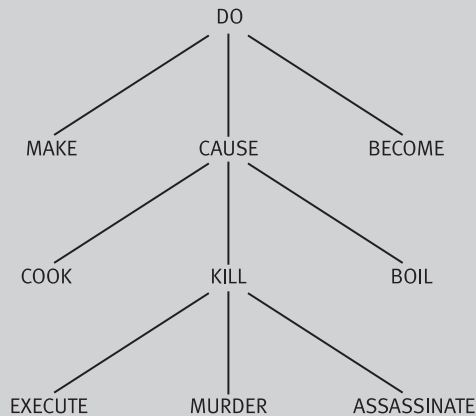
Thus, CHAIR will be a better instance of FURNITURE than BOOKCASE, which in turn is a better example than TELEVISION and TELEPHONE (if indeed televisions and telephones count as furniture at all).

Secondly, on the classical view, there is no reason for assigning special status to any particular level of categorization, except perhaps to the very highest and the very lowest. (The very highest level is superordinate to all other categories, and thus does not contrast with any other category on that level; while terms on the very lowest level refer to individual instances.) The facts of cognition and language use, however, belie this assumption. There is, namely, a level of categorization which is cognitively and linguistically more salient than the others. This is the **basic level** of categorization – the level at which (in the absence of reasons to the contrary) people normally conceptualize and name things.

It is at the basic level that people conceptualize things as perceptual and functional gestalts (Rosch *et al.* 1976). Try, for example, to visualize or to draw a picture of a piece of furniture. The task seems absurd. One feels compelled to ask, 'What kind of furniture? A table, a chair, a bed?' It would not, however, be unreasonable to ask someone to draw a picture of a chair. In this case, your interlocutor would not feel compelled to ask, 'What kind of chair? A kitchen chair, a dentist's chair, an armchair?' It is similarly absurd to try to describe how one interacts with a piece of furniture, or to name the parts of which a piece of furniture is composed. We have no difficulty, though, in describing the motor movements we perform when interacting with a chair, or to name the parts of which a chair is composed. It thus comes as no surprise that it is the basic level at which, in the absence of specific reasons to the contrary, people normally talk about reality (Downing 1977*a*). If a foreigner

were to point to the object I am now sitting on and ask 'What do you call that in English?', I would almost certainly answer, 'It's a chair.' I would not reply 'It's an artefact', or 'It's a piece of furniture', even though these alternative answers would be equally 'correct'.[5]

On purely formal, language-internal grounds, basic level terms can often be distinguished from non-basic terms. In addition to their high frequency of occurrence, basic level terms are generally short and structurally simple (i.e. monomorphemic). Terms below the basic level are frequently compounds consisting of the basic level term plus a modifier (e.g. *kitchen chair*). Terms above the basic level are sometimes deviant in some way (e.g. *furniture* is morphosyntactically unusual in that it is uncountable, i.e. one cannot say *\*a furniture* or *\*furnitures*). It can also happen that superordinate terms are simply missing from the vocabulary of a language. English, for instance, has numerous colour terms which are subordinate to basic colour terms, but has no term which is superordinate to all the basic colour terms. (*Coloured* will not do; this word refers only to the chromatic colours, and excludes black, white, and grey.) Sometimes, if the need for a superordinate term is felt strongly enough, learned terms (such as *sibling* as a superordinate to *brother* and *sister*), or cumbersome circumlocutions, may be coined.

A particularly interesting correlation between position in a categorization hierarchy and grammatical gender has been shown to hold in German (Zubin and Köpcke 1986). Terms above the basic level of categorization are 'conceptually vague and undifferentiated'; these terms, with more than chance frequency, are neuter. At the basic level and below, noun meanings are 'richly specified both perceptually and functionally'. These nouns tend to be either masculine or feminine, with neuter appearing more rarely. The superordinate terms *Tier* "animal", *Obst* "fruit", *Gemüse* "vegetable", *Metall* "metal" are neuter, while names of specific animals, fruits, vegetables, and metals are generally either masculine or feminine.

What gives basic level terms their privileged status? The answer is to be sought in the usefulness of the basic level categories. Categorization makes it possible for an organism to reduce the limitless variation in the world to manageable proportions. A category fulfils this function in virtue of the fact that 'by knowing the category to which a thing belongs, the organism, thereby, knows as many attributes of the thing as possible' (Rosch 1975c: 197). By the same token, a maximally useful category also makes it possible to exclude as many attributes as possible. That categories can function in this way rests on the fact that attributes do not occur randomly in the world, but tend to be correlated with each other, either positively or negatively (cf. p. 37). That is to

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[5] As the examples suggest, the notion of basic level term is generally understood in connection with nominal categories. But the construct is applicable to other kinds of concept. Rosch (1978) reports evidence suggesting that events like 'do the washing up' and 'brush one's teeth' have basic level status, while 'do the household chores' and 'squeeze toothpaste onto the brush' have superordinate and subordinate status, respectively.

say, the presence of attribute *A* tends to be associated in the world with the presence of attribute *B* and with the absence of attribute *C*. This is one reason for our common-sense rejection of the reality-as-a-continuum hypothesis, mentioned in Section 1.1. If we know that an entity is feathered, has wings, and can fly, we can state with some confidence that it also lays eggs. On the other hand, having fur and a tail are attributes which are not associated with laying eggs and the ability to fly. Now, the Aristotelian model of categories assumed a perfect correlation between the defining attributes of a category. On the Aristotelian view, by knowing the category to which a thing belongs, one knows with complete certainty that certain attributes will co-occur; these are the attributes that are necessary conditions for category membership. Experience tells us, however, that such perfect correlations are rare. There are cups with no handles (Chinese cups), birds which don't fly (penguins), mammals which lay eggs (the platypus), cats without tails (Manx cats), and chairs which aren't really for sitting on (dentist's chairs).

Rosch argues that it is the basic level categories that most fully exploit the real-world correlation of attributes. Basic level terms cut up reality into maximally informative categories. The basic level, therefore, is the level in a categorization hierarchy at which the 'best' categories can emerge. More precisely, Rosch hypothesizes that basic level categories both

(a) maximize the number of attributes shared by members of the category; and

(b) minimize the number of attributes shared with members of other categories.

Consider once again the members of the category FURNITURE. Glancing at Table 3.1, one would have a hard task to identify any essential defining attributes of the category. Even if we restrict our attention to the thirty or so more typical members of the category, there do not appear to be any attributes which uniquely distinguish articles of furniture from other household arte-facts. Indeed, it is difficult even to identify a feature which is common to all the typical members. If we turn to a basic level category, such as CHAIR, it is evident that different kinds of chair do share quite a lot of attributes; moreover, these attributes are not shared by members of other basic level categories, such as BED and TABLE. Members in the categories on the next lowest level, e.g. KITCHEN CHAIR, also share a large number of attributes. Many of the attributes of kitchen chairs, however, are also shared by other kinds of chair, e.g. dining-room chairs. While KITCHEN CHAIR maximizes the attributes shared by members of the category, it is not maximally distinct from other categories on the same level.

The issue was investigated experimentally by Rosch and Mervis (1975). For each of a number of superordinate categories like FURNITURE, VEHICLE, and FRUIT, the authors selected the names of twenty members in the category. The

members exhibited the full range of membership in the higher category. Each of the member names was given to a group of twenty subjects who were asked to list as many of the attributes of the category as possible in a given period of time. It was indeed found that some of the attributes which were listed by the subjects were associated with several members of the superordinate category; other attributes that the subjects listed, however, were unique to individual members. Very few of the attributes, it turned out, were common to *all* the members of a superordinate category. Even if common attributes did emerge, e.g. [you eat it] as an attribute of different kinds of fruit, these were usually so general that they could not be regarded as defining, even for the superordinate category. It was, however, found that the more central members of a superordinate category did elicit more shared attributes than the more marginal members. For instance, the five most central members of FURNITURE had thirteen attributes in common, while the five least central members shared only two attributes. The five most typical members of CLOTHING had twenty-one attributes in common, while the five least typical members shared no attributes at all.

It will be apparent that the notion of the basic level meshes in with the prototype structure of categories. Categories typically have fuzzy edges and might even merge into each other; some attributes might be shared by only a few members of a category; there might even be categories with no attributes shared by all their members. In order to keep our categories maximally distinct, and hence maximally informative, we need to focus on the basic level of categorization, more specifically, on the more central members of basic level categories.

## 3.4 Prototypes and the basic level

There is another way to look at the interplay between the basic level and prototypes. The basic level has to do with what things are called– the object I am now sitting on would be called a chair, not a piece of furniture, or an artefact. Prototypes have to do with what words refer to: thinking of the word *furniture*, I would apply the word, primarily, to chairs, beds, and tables, rather than to stools, mirrors, and lamps.

The relationships were studied by Geeraerts *et al.* (1994), in an ingenious study. Geeraerts and his colleagues focused on a single lexical field, and on a single domain of discourse, namely terms for outer clothing garments as used in a selection of Dutch-language fashion magazines. They included in their study only linguistic tokens that could be unambiguously paired with a visual representation of the intended referent. On the basis of its pictorial representation, each referent, after having been assigned to one of several garment types, such as 'trouser-like garment', or 'jacket-like garment', was described in terms of a set of attributes appropriate to that garment type.

Thus, for trouser-like garments, the relevant attributes included such aspects as length of leg, broadness/tightness of fit, and so on.

This set-up permitted a systematic combination of the semasiological and the onomasiological perspectives. The **semasiological** perspective asks, for a given linguistic expression, what range of entities or situations may be named by it. The **onomasiological** perspective is the converse, and asks, for any given entity or state of affairs, what range of linguistic expressions may be used to denote it. With respect to the clothing items, therefore, Geeraerts and his colleagues were able, for any term, to list all the features, and feature combinations, of the garments which a given term was used to denote; conversely, for any garment-type, described in terms of a combination of attributes, they were able to list all the linguistic expressions which were used to refer to it.

The identification of a prototype relies on the semasiological perspective, in that a prototype may be characterized in terms of **semasiological salience**. For terms such as *broek* "trousers", *jeans*, and *legging*, it was possible to list the most frequent attributes, and attribute combinations, of the referents, and so to come up with detailed specifications of the prototypical instances of the categories. The methodology also, of course, made it possible to plot the usage range of a given term outside the prototypical core. The data confirmed that for many of the terms investigated, the categories could not be adequately delimited from neighbouring categories on the basis of a set of necessary and sufficient features. **Onomasiological salience**, on the other hand, defines the notion of basic level term. A term is basic level to the extent that *this* term, rather than another, is selected with greater frequency to refer to a certain entity. One important aspect of the study, therefore, is that it offers a refinement, and operationalization, of the notions of prototype and basic level term.

A particularly interesting finding was that basic level terms do not always occur on the same level in the categorization hierarchy. Rather, the level is liable to vary, depending on the nature of the category in question. Let us suppose that *trousers*, *jacket*, and *shirt* have basic level status. (When returning from a clothes-buying expedition, one would most likely describe one's acquisitions using such terms.) But what about *jeans*? From one point of view, *jeans* is a subordinate term – jeans are a kind of trousers. Yet if you had bought jeans in the clothing store, you would probably say so. Although they constitute a subcategory of trousers (itself a basic level category), jeans have acquired such a high degree of cultural salience that they also have to be accorded basic level status.

Geeraerts's strategy of combining the semasiological and the onomasiological approaches – that is, of considering, for each linguistic term, what range of entities it can be used to designate, and, conversely, of considering, for each entity, the range of linguistic expressions that can be used to designate it – is obviously applicable only in the special situation in which linguistic expressions and their referents can be reliably matched up with each other. It

would be difficult to imagine how the two perspectives could be brought to bear on a study of some other conceptual domains, such as the domain of emotions and feelings. There is one domain, however, which lends itself particularly well to the combination of the semasiological and the onomasiological perspectives, and this is colour. (Colour once again turns out to be an 'ideal testing ground'– see p. 2 – for semantic theories.) MacLaury, extending the methodology of Berlin and Kay (1969), developed a three-part elicitation procedure for use in the field.[6] In the first part, subjects are required to *name* each of 330 colour chips presented in random sequence; then to *select* on a colour chart the best example of each of the colour terms they had earlier proffered; and finally to *map* each of their colour terms on the colour chart, by indicating which colours on the chart could be named by the respective terms. It will be appreciated that the naming task is suited to eliciting the basic level colour terms of the language– these are the terms that subjects volunteer when asked to give names for different colours. A common finding, here, is that speakers of the 'same' language tend to differ with respect to the number of colour terms that they offer, suggesting, once again, that the notion of the 'basic level' might be somewhat unstable. Certainly, English speakers might well proffer many more than the eleven basic terms postulated by Berlin and Kay (1969). The second task– that of selecting the best example of a colour term– elicits the prototypical instance of the term, while the mapping task investigates the denotational range of each of the basic terms that a subject had volunteered. One interesting finding was that naming and mapping ranges do not always coincide; the fact that colour sample $c$ is named by colour term $t$ does not entail that $t$ will be mapped so as to include $c$, and vice versa.[7] These findings suggest, once again, that colour words do not neatly organize themselves into a basic level and a subordinate level, neither can the relations between the colour words be understood simply in terms of relations of hyponymy (whereby one colour is a subcategory of another) and contrast, as predicted by the classical theory.

## 3.5 Where do prototypes come from?

There can be little question of the psychological reality of the prototype structure of categories. Degree of category membership can be readily elicited from speakers of a language; degree of membership characterizes many different kinds of category; and it is a variable which determines performance on

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[6] For a succinct exposition, see MacLaury (1987); for more comprehensive accounts of the methodology, and for the wider significance of the findings for theories of categorization, see MacLaury (1995*a*, 1995*b*).

[7] Another of MacLaury's findings that is worth mentioning concerns the considerable between-speaker variation– even for speakers of the 'same' language– on the various tasks. MacLaury's protocols, in fact, provide convincing evidence of the uniqueness of each person's linguistic knowledge, a matter briefly touched on p. 59.

a wide range of diverse experimental tasks. Given the reality of graded membership in a category, the question arises as to why it is that certain exemplars of a category come to have the privileged status of prototypical members, while other exemplars are marginal members. Why is it that chairs, sofas, and tables, and not mirrors, shelves, and clocks, are prototypical articles of furniture, or that murder is a better instance of killing than sacrificing? As Geeraerts (1988*b*) asks: Where do prototypes come from?

Rosch (1975*c*) considers a number of possible answers to this question. For a limited number of categories, prototypicality is very plausibly a consequence of inherent properties of human perception. The prototypicality of focal colours very probably has a natural basis in the neurology of colour perception; in a sense, colour categories pre-exist their linguistic encoding. There is evidence that certain geometrical forms (the good forms of gestalt psychology, e.g. circle, square, triangle) and certain spatial orientations (e.g. vertical and horizontal rather than oblique), like focal colours, are perceptually more salient than deviations from these forms, and thereby also acquire prototype status (Rosch 1973*a*). Presumably, there are going to be relatively few categories of this nature. There can be no question of a neurological basis to the perception of prototypical cups and furniture, since these are artefactual categories, a product of our cultural history. Other explanations must therefore be sought for the prototype structure of these categories.

One possible explanation– and one that is intuitively quite appealing– is that members of a category achieve prototypical status because we encounter them more frequently. It may well be the case that when considering the category FURNITURE, we think immediately of tables and chairs, not of mirrors and clocks, and may thus conclude that we encounter tables and chairs more frequently than mirrors and clocks. At issue, however, is not how frequently we encounter tables, chairs, mirrors, and clocks as such, but how frequently we encounter tables and chairs categorized as furniture in contrast to mirrors and clocks categorized as furniture. Once this distinction is made, appeal to frequency turns out to be ultimately circular.

Rosch, in her research, carefully controlled for word frequency; degree of membership in a category, as reported in her various publications, is independent of the frequency of occurrence of member names. In fact, she warns us to be suspicious of frequency as an explanation of prototypicality. The impression of a higher frequency of occurrence of prototypical members may well be a *symptom* of prototypicality, not its cause. As already noted, when asked to name examples of a category people tend to mention prototypical members first. It is along these lines that Rosch (1976) accounts for what she calls the 'good old days effect'. In recalling earlier episodes in our lives, we tend to exaggerate the frequency of prototypical, and underestimate the frequency of non-prototypical components of those situations. Thus the past is remembered, without differentiation, as pleasant (or unpleasant, as the case may be). This kind of explanation may also be offered for the fact that

children's drawings generally depict grass as an undifferentiated green and the sky as a constant blue, even though in some environments, the sky is more often grey than blue, and grass for much of the year might be brown. The children's drawings depict the colour of prototypical grass and a prototypical sky. Prototypically, the sky is blue, which is not the same as saying that the sky is usually blue.

Another factor that Rosch proposes is order of learning, a possibility which Pulman (1983) also embraces. (It seems unlikely, however, that children brought up with a Pekinese would go through life with a Pekinese as their dog prototype.) A further possibility is that in some instances the prototype might embody the mean values of variable attributes. Prototypical birds, for instance, seem to be birds of average size and average predacity (Rips *et al.* 1973). Alternatively, certain attributes might be particularly salient, e.g. because they are especially important in a society, with the result that these attributes cluster in prototypes. Thus, Wierzbicka (1985) accounts for the characteristics of prototypical cups in terms of norms for social tea-drinking. Even the focal reference of certain colour terms may well be a consequence of the importance of certain objects within a culture (see McNeill 1972 on colour terms in Japanese).

While each of the above factors may no doubt play some role in the emergence of prototypes, I am inclined to favour a functional explanation of prototypes. Recall that the basic level is the level of categorization which (a) maximizes the number of attributes shared by members of each category, and (b) minimizes the number of attributes shared by different categories. It is the prototypical centres of the categories which best fulfil these functions, not the more peripheral members, nor indeed the totality of the category members. A Pekinese is not the dog prototype, because in terms of its size and general appearance, this breed of dog is not all that dissimilar from the cat prototype; neither could a Neapolitan mastiff emerge as the prototype, since this breed is almost the size of a small donkey. Or consider the prototype of 'telling a lie' (Coleman and Kay 1981). The prototypical lie consists in a person (a) saying something which they believe to be untrue, (b) with the intention of deceiving the hearer, and (c) in the expectation that the hearer will be harmed and/or that the speaker will derive some illegitimate benefit. In all these respects, a prototypical lie contrasts with a (prototypical) bona fide assertion. A proto-typical assertion consists in a person (a) saying something which they believe to be true, (b) with the intention of informing the hearer, and (c) in the expecta-tion that the hearer will benefit from this information (Sweetser 1987). Non-prototypical lies (as when a guest at a boring party thanks the host for a 'most delightful evening', or when a person makes an incomplete statement of the facts, withholding information damaging to himself) are non-prototypical, precisely because they do not contrast maximally with bona fide assertions.

Whatever the origins of a prototype might be, there can be little doubt about the greater cognitive and communicative efficiency of prototype

categories *vis-à-vis* classical categories. Prototype categories have flexibility, unknown to Aristotelian categories, in being able to accommodate new, hitherto unfamiliar data. With only Aristotelian categories at our disposal, new data would often demand, for their categorization, the creation of new categories, or a redefinition of existing categories. On the other hand, new entities and new experiences can be readily associated, perhaps as peripheral members, to a prototype category, without necessarily causing any fundamental restructuring of the category system:

Cognition should have a tendency towards structural stability; the categorial system can only work efficiently if it does not change drastically any time new data crop up. But at the same time, it should be flexible enough to adapt itself to changing circumstances. To prevent it from becoming chaotic, it should have a built-in tendency towards structural stability, but this stability should not become rigidity, lest the system stops being able to adapt itself to the ever-changing circumstances of the outside world. . . . It will be clear that prototypical categories are eminently suited to fulfill the joint requirements of structural stability and flexible adaptability. On the one hand, the development of nuances within concepts indicates their dynamic ability to cope with changing conditions and changing expressive needs. On the other hand, the fact that marginally deviant concepts can be incorporated into existing categories as peripheral instantiations of the latter, proves that these categories have a tendency to maintain themselves as holistic entities, thus maintaining the overall structure of the categorial system. (Geeraerts 1985: 141)

Certainly, from one point of view, the most efficient categories– categories based on a perfect correlation of attributes over their members– are classical categories. Yet, as Geeraerts argues, the very rigidity of classical categories would make them highly inefficient for human cognition, since the flux of experience rarely presents us with the perfect correlation of attributes which classical categories require. In a sense, prototype categories give us the best of both worlds. The central members of a prototype category do share a large number of attributes (cf. Rosch and Mervis 1975)– in this respect, the centre of a prototype category approaches the ideal of a classical category. At the same time, prototype categories permit membership to entities which share only a few attributes with the more central members. In this respect, prototype categories achieve the flexibility demanded by an ever-changing environment.

## 3.6  Some applications

I will delay until the next chapter a more detailed elaboration of the prototype model of categories. Then, in the remainder of this book, I explore some of the far-reaching implications of prototype categorization, not only for the study of word meaning, but also for syntax and phonology. In the meantime, we can pause to glance at one area of linguistic research where the prototype

category has an obvious and immediate application. This is in the study of semantic equivalence, both between and within languages. Let us begin with the case of intra-language synonyms. It is a common observation that perfect synonyms– lexical items with the same meaning and which are therefore interchangeable in all contexts– are exceedingly rare. Geeraerts (1988*b*) offers as possible candidates the two verbs *vernielen* and *vernietigen* "to destroy, bring to nought" in nineteenth-century Dutch. The two words appear to have referred to exactly the same range of situations and exhibited identical selectional restrictions, even in the writings of one and the same author. Were the words, then, perfect synonyms? Geeraerts argues that they were not. Differences emerged when the frequencies of different senses were compared, *vernietigen* being used predominantly in an abstract sense, while *vernielen* referred predominantly to an act of physical destruction. Remarks in contemporary handbooks of good usage also pointed to a difference in the conceptual centres of the two words.

This example suggests that while two words may be distributionally and referentially equivalent, they may nevertheless be associated with distinct prototypes. Such a state of affairs can occur with regard to the 'same' word as used by speakers of different varieties of a language. Kempton (1981) reports a small-scale experiment in which he assembled fifty articles of footwear and asked people to classify these as boots, shoes, slippers, etc. He found that his American (Texan) and British informants showed considerable agreement as to which articles were the boots. Yet the two groups of speakers seemed to operate with markedly different prototypes. For the Texans, the prototypical boot came high above the ankle, like a cowboy boot; for the British, the prototype was an army boot, which did not come above the ankle. To what extent this phenomenon is characteristic of a wide range of pan-dialectal items, or even whether speakers of one and the same dialect also operate with divergent prototypes, is a matter which would merit further research. Kempton, for instance, reports on different prototype representations of Mexican ceramics, mainly as a function of the degree of Westernization and urbanization of the speakers. It is worth noting in this connection that for Langacker, it is 'self-evident' that 'no two speakers share precisely the same linguistic system' (1987: 376). Presumably, in day-to-day exchanges, differences in conceptual centre are likely to pass unnoticed, especially if the lexical items in question can be applied to an identical range of referents. It is an open question, however, to what extent such differences in the conceptual centre might sometimes hinder communication, or even lead to gross misunderstandings.

Whatever the variation in category representation between speakers of a given language or dialect, there can be little doubt that the prototype representations of many categories may change dramatically over time. Speakers in 1800, 1900, and 2000 would surely have selected different entities as good examples of the vehicle category, while the prototypical automobiles of eighty

**Table 3.2** Goodness-of-example ratings for fifty-five members of the category
MÖBEL "furniture"

| Member | Rank | Specific score | Member | Rank | Specific score |
|---|---|---|---|---|---|
| bed | 1.5 | 1.00 | bar | 29 | 3.70 |
| table | 1.5 | 1.00 | counter | 30 | 3.73 |
| sofa | 3 | 1.13 | mirror | 31 | 4.20 |
| cupboard | 5 | 1.20 | drawers | 32 | 4.38 |
| desk | 5 | 1.20 | dresser | 33 | 4.47 |
| closet | 5 | 1.20 | lamp | 34 | 4.79 |
| chair | 5 | 1.20 | piano | 35 | 5.07 |
| love seat | 8 | 1.40 | clock | 36 | 5.20 |
| chest of drawers | 9 | 1.43 | stove | 37 | 5.33 |
| bookcase | 10 | 1.47 | wastebasket | 38 | 5.42 |
| night table | 11 | 1.53 | refrigerator | 39 | 5.73 |
| coffee table | 12.5 | 1.67 | rug | 40 | 5.80 |
| couch | 12.5 | 1.67 | picture | 41 | 5.93 |
| china closet | 14 | 1.70 | hassock | 42.5 | 6.00 |
| cabinet | 16 | 1.73 | drapes | 42.5 | 6.00 |
| divan | 16 | 1.73 | TV | 45 | 6.07 |
| bureau | 16 | 1.73 | rocker | 45 | 6.07 |
| buffet | 18 | 1.80 | footstool | 45 | 6.07 |
| davenport | 19 | 1.93 | hi-fi | 47 | 6.33 |
| shelf | 20.5 | 2.00 | vase | 48 | 6.40 |
| rocking chair | 20.5 | 2.00 | radio | 49.5 | 6.47 |
| bench | 22 | 2.10 | sewing machine | 49.5 | 6.47 |
| lounge | 23 | 2.27 | fan | 51 | 6.54 |
| stool | 23 | 2.27 | stereo | 52 | 6.64 |
| vanity | 23 | 2.27 | pillow | 54 | 6.80 |
| ottoman | 26 | 2.43 | telephone | 54 | 6.80 |
| end table | 27 | 2.80 | ashtray | 54 | 6.80 |
| magazine rack | 28 | 3.40 | | | |

years ago are now fairly marginal exemplars of the category. Possibly, more
abstract concepts, like love and beauty, have undergone even more dramatic
changes.[8]

A final area of interest concerns the presumed translation equivalence of
words in different languages. Some data relevant to this issue are given in
Table 3.2. Table 3.2 (reproduced by kind permission of René Dirven) sum-
marizes the results of a small-scale replication of Rosch's investigation of the
category FURNITURE. German-speaking subjects were asked to assign a degree
of membership in the category MÖBEL "furniture" to German names of fifty-
five household items. Dirven (personal communication) suggests that the

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[8]   A veritable mine of information, here, is C. S. Lewis's *Studies in Words* (1960).

differences between Table 3.2 and Table 3.1 indicate that the German students were perhaps assessing category membership on the basis of the furnishings of a typical student's room, while Rosch's American subjects may have been visualizing their parents' lounge. If this is the case, *Möbel* and *furniture* cannot be considered exact translation equivalents, at least for the populations tested, even though the referential range of the two words would appear to coincide.

## Study questions

1. Vehicles in the park. Imagine that a municipal park displays the notice 'No Vehicles Allowed in the Park'. Imagine, furthermore, that the prohibition dates back to a by-law of 1880. What kinds of vehicles do you think the city fathers of 1880 wished to outlaw from the park? How would a modern visitor to the park interpret the notice? Has the meaning of the word *vehicle* changed over the intervening years?

   Suppose that in 2003, someone takes their four-wheel drive through the park, and is prosecuted for so doing. Could they defend themselves on the grounds that the city fathers, in 1880, did not have four-wheel drive vehicles in mind when they formulated the by-law? Assemble some arguments for and against this line of defence.

2. Games. Wittgenstein's ruminations on the game-category were written in German, and applied to the German word *Spiel*, not to the English word *game*. German *Spiel* is rather broader in its range of application than the English word. In some contexts, the German word could be translated as *match* or *play*. How could one differentiate the English nouns *game*, *match*, and *play*?

3. Natural kinds and nominal kinds. *Gold*, *giraffe, measles*, and *lemon* are names of natural kinds; *chair*, *bachelor*, *hammer*, and *table* are names of nominal kinds. List some of the properties which distinguish the two types of categories. Consider aspects such as the following:

   • natural kinds are presumed to possess some defining essence, which exists independently of how humans interact with members of the category;
   • the study of the defining essence could be the legitimate object of scientific enquiry;
   • scientists (or other kinds of experts) might be called upon to judge whether an entity is a genuine example of a natural kind, or whether it is a fake, an imitation, or artificial;
   • changes to the perceptual properties of an entity (e.g. a giraffe whose neck was shortened by some surgical operation, or a new variety of lemon which was orange-coloured) would not change its defining essence.

   Consider now the status of the following with respect to the natural kind/nominal kind distinction:

a computer, a certified antique, an original artwork, an anthill, plastic, glass, industrially produced diamonds

Could there be grounds for claiming that 'natural kinds' and 'nominal kinds' constitute prototype categories?

4. Basic level categories. I stated in the text that the basic level is the level in a categorization hierarchy at which things are normally named, in the absence of reasons to name them at a different level. What factors might motivate a person to name things with a superordinate term (such as *furniture*, or *creature*), or with a subordinate term, such as *kitchen chair*, or *penguin*?

Suppose that *tuberculosis*, *cancer*, *meningitis*, etc. are basic level terms for illnesses. What might motivate a person to refer to cancer by a superordinate term, such as an *illness*? Or to refer to cancer by a subordinate term, such as *lung cancer*?

5. Birds and ducks. For me—I am not an ornithologist, nor even an amateur birder—BIRD is a basic level category. If there are starlings pecking away at berries on a bush in winter, I would remark on the 'birds' that we have in the garden, using the basic level term. If, however, a pair of ducks were to waddle over my lawn, I would remark on the 'ducks in the garden', not on the 'birds'. How might one explain this choice of what seems to be a subordinate level term?

# Further reading

On prototypes, see Lakoff (1987*b*), Tsohatzidis (1990), Kleiber (1990), the review article of MacLaury (1991), and Ungerer and Schmid (1996). A condensed version of the relevant parts of Lakoff (1987*b*) may be found in Lakoff (1987*a*). For applications of the prototype concept, see the special issue of the journal *Linguistics* (Vol. 27(4), 1989) on the theme 'Prospects and problems of prototype theory'. Geeraerts's introduction to the volume gives a good overview of different approaches to prototype categorization.

Rosch (1978) is useful as a summary of Rosch's research.

Nominal kinds and natural kinds are discussed in Pulman (1983: ch. 6) and in Keil (1989, chs. 1–3).

For prototypes in language change, see Geeraerts (1997), esp. ch. 1.

For a critical voice against the prototype concept, see Wierzbicka (1996: ch. 4).

CHAPTER 4

# Prototype Categories: II

This chapter continues the discussion of prototype categories begun in Chapter 3. A number of issues need to be dealt with. Firstly, the notion of prototype itself needs to be given more substance. What exactly are prototypes? The discussion will lead us to reconsider the status of classical categories. If all kinds of entities—natural and artefactual, those denoted by nouns as well as those denoted by verbs and adjectives, even, as we shall see in later chapters, the categories of linguistic structure itself—are categorized by prototype, what, if anything, is left of the classical model? Do all categories have a prototype structure, or are there still categories which conform with Aristotelian principles, i.e. categories with necessary and sufficient conditions for membership, with clear-cut boundaries, and with only two degrees of membership, i.e. member and non-member? We shall see that Aristotelian categories may still need to be recognized, although their status will need to be reassessed. First, though, I shall spell out in more detail exactly what is meant by a prototype, and consider some of the difficulties associated with prototype categorization.

## 4.1  Prototypes

There are several ways in which to understand the term 'prototype'. We might apply the term to specific instances of a category. Thus, one could refer to a

specific artefact as the prototype of CUP. This is the prototype-as-exemplar view. Alternatively, the prototype can be understood as a specific kind of entity. This is the prototype-as-subcategory approach. Thus, one could refer to a certain kind of cup, that is, cups which exhibit a certain set of attributes, as the prototype. On this approach, we would say, not that a particular entity *is* the prototype, but that it instantiates, or exemplifies, the prototype. We can imagine an even more abstract notion of prototype, which captures the conceptual 'centre' of a category, but which might not be associated with any specific instance, or subcategory. This is the prototype-as-abstraction approach.

These are, to be sure, difficult questions, and a definitive answer, valid for all categories, may not be possible. There are, I think, good reasons for rejecting the first of the above approaches, namely, the view of prototypes as exemplars. Even if one might be able to refer to an entity as *the* prototype of a category, one still needs to posit a mental representation of the prototype, in order for a speaker to be able to identify the prototype on different occasions and under different conditions. A special difficulty arises with more abstract categories. If prototypes are exemplars, where would we expect to find the prototype of COWARDICE and TALLNESS? Events can be described as (more or less) proto-typical instances of COWARDICE, objects exhibit a (more or less) prototypical TALLNESS. One could not, however, say that an event *is* the prototype of COWARDICE, nor could one pick out an object as *the* prototype of TALLNESS.

A decision concerning the remaining possibilities—the prototype as a sub-category, or the prototype as an abstract representation of the category's centre—may well depend on the nature of the category under consideration, in particular its level in the categorization hierarchy. For a superordinate category, such as FURNITURE, it may actually be inappropriate to talk about *the* prototype at all; rather, subcategories of furniture, such as CHAIR, TABLE, and BED, constitute prototypical members of the category. In this case, the prototypes are themselves categories. For basic level categories, the prototype may well be a fairly abstract representation, which abstracts away from the properties of individual instances and individual subcategories. It is con-ceivable, for example, that the prototype of DOG does not make reference to any specific breed of dog, nor to any properties of specific instances of the category, such as coloration. The prototype consists in the coming together of a set of typical attributes, concerning size, shape, behaviour, temperament, interaction with humans, and so on. It is this conception of the prototype that may be activated whenever a person is asked to visualize 'a dog' or to draw a picture of 'a dog', and which is invoked if a person is required to assess a particular dog, or breed of dog, in terms of its centrality in the category DOG.[1]

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[1] It is worth noting that Rosch, in her later work at least (e.g. Rosch 1978), declines to draw conclusions from her experimental work as to the mental representation of categories, contenting herself with a characterization of prototypicality merely in terms of its experimental effects (membership judgements, reaction times, etc.).

Let us suppose that entities are assigned membership in a category in virtue of their similarity to the prototype; the closer an entity to the prototype, the more central its status within the category. The notion of similarity thus underlies all categorization processes. Yet similarity is one of the most difficult of psychological constructs, for two reasons. Firstly, as already implied, similarity is a graded concept. Things can be more similar, or less similar. But how different do two things have to be for them to cease to be similar? The second difficulty has to do with the fact that similarity is also a subjective notion. Similarity, like beauty, lies in the eye of the beholder. Once we invoke similarity as a basis for categorization, we inevitably bring language users, with their beliefs, interests, and past experience, into the picture. Things are similar to the extent that a human being, in some context and for some purpose, chooses to regard them as similar.

In measuring similarity, classical semanticists had it (relatively) easy. On the classical view, things are similar in proportion to the number of features they share. To the extent that features are taken to be universal primitives, which are either present or not present in any particular case, similarity judgements are not tainted with subjectivity. In a sense, similarity is reduced to partial identity. But in rejecting the classical approach, we have also rejected the binary feature as a theoretical construct, and have spoken instead of attributes. In point of fact, the classical view of similarity was never quite so unproblematic. For instance, there is the question whether all features should count equally as criteria for similarity, or whether the sharing of a feature like [ANIMATE] should carry less weight than the sharing of a feature like [MARRIED] (cf. Lyons 1977: 553). This and other problems of the classical view find a sophisticated resolution in Tversky's (1977) attribute model of similarity. The model computes the similarity of two entities not only on the basis of the number of attributes they share, the number of attributes not shared is also taken into consideration. Furthermore, attributes are differentially weighted. Some attributes receive a high weighting on account of their perceptual salience, others because of their high diagnostic value. Perceptual salience is relatively constant across contexts, while diagnostic value is liable to vary, depending on the context of comparison.

It is easy to see how prototype effects could be accommodated within Tversky's model. The model would compute, for any given entity, a numerical value of similarity with the prototype representation. For an entity to achieve membership in a category, a certain threshold value, specified for that category, would have to be exceeded, while values above the threshold would determine increasing degrees of membership. This kind of approach, however, betrays a serious weakness, in that it ignores the fact that attributes can be cognitively quite complex. Consider again Wittgenstein's discussion of games (pp. 42–3). Characteristic of a number of games is the need for skill on the part of the players. But skill is not a primitive semantic feature. It is not just that skill is a graded concept, in the sense that some games might require more

skill than others. More important is the fact that the skill needed in tennis is a different kind of entity to the skill needed in chess. To say that tennis and chess are similar on account of the common attribute [skill] itself presupposes a categorization, namely a set of similarity judgements between each kind of skill and a conception of prototypical skill. As René Dirven has remarked (personal communication), prototypicality is recursive, in that the very attributes on whose basis membership in a category is determined are more often than not themselves prototype categories. Take, as a further example, [ability to fly] as an attribute of birds. A prototypical instance of this attribute is exhibited by robins. Hens, on the other hand, while certainly able to lift themselves off the ground by energetically flapping their wings, cannot fly in the same way as robins. They exhibit a rather marginal [ability to fly]. This example points to another problem. Prototypical instances of [ability to fly] are exhibited by the prototypical members of the very category which the attribute is supposed to characterize. This state of affairs is not unusual. Other attributes of the BIRD prototype, such as the presence of feathers, wings, and a beak, the building of nests, and the laying of eggs, would appear prima facie to require, for their characterization, a prior understanding of what birds are.

Decomposing an attribute into its constituent attributes might go some way towards solving the second of these problems; it does not necessarily remove its prototype structure. Suppose we define [ability to fly] as the ability for fairly rapid self-propelled motion through the air. Let us take each of these sub-attributes in turn. How much external assistance does an object have to have before it loses its capacity for self-propelled motion? Does a stone thrown into the air possess this attribute? Presumably it does, but not in the required sense. And if motion through the air is not self-propelled, is [ability to fly] thereby precluded? Consider the case of gliders and hot air balloons. Secondly, how fast does an object have to move before its motion can be described as 'fairly rapid'? Does a hot air balloon satisfy the requirement? Finally, for how long does an object have to be airborne, and what distance does it have to be from the ground, for one to be able to say that it moves through the air? Does an athlete doing the high jump qualify? To what extent, then, can one say that gliders, hot air balloons, stones thrown into the air, and jumping athletes exhibit the attribute [ability to fly]?

It is one of the myths of the classical theory that complex concepts are ultimately reducible to sets of binary primitives. Underlying the above attempt to characterize the attributes of an attribute is the assumption that a complex cognitive structure can be exhaustively represented by means of a listing of its components, the assumption, in other words, that a whole is nothing more than the sum of its parts. Cognitive structures often need to be under-stood more as holistic, gestalt configurations, than as attribute bundles. (Recall, in this connection, our earlier discussion of KNIFE, in Section 2.4.) Especially when we are dealing with basic level categories, the whole might

well be perceptually and cognitively simpler than any of its individual parts, such that the parts are understood in terms of the whole, rather than vice versa. Such a view follows, in fact, from Rosch's characterization of the basic level (cf. Lakoff 1987*b*: 56 and *passim*). These considerations do not mean that it is illegitimate to speak of attributes, provided that one does not intend by this term the atomic (or even molecular) semantic components of the classical theory. Attributes are simply the dimensions along which different entities are regarded as similar. They embody 'the commonality [that speakers] perceive in arrays of fully specified, integrated units' (Langacker 1987: 22).

Bearing in mind this proviso on the nature of attributes, let us now address some of the more controversial aspects of prototype categorization. Firstly, it needs to be stressed that a mental representation of a prototype constitutes but one component of a person's knowledge of a category. To see why this should be so, we need only consider some of the fairly obvious similarities which exist between, for example, cats and dogs. In spite of these similarities, we do not want to say that cats are members, not even highly marginal members, of the category DOG. If unrestricted, a category could eventually encompass the whole universe of entities, since it is possible to establish some kind of tenuous similarity between virtually any pair of objects. Clearly, our representation of DOG imposes a category boundary, beyond which certain kinds of things cannot get associated, even loosely, with the category. With respect to natural kinds (p. 47), such as BIRD and GOLD, we often do assume that these can be ultimately characterized in terms of their essence—DNA in the case of living kinds, molecular structure in the case of minerals and chemicals—even though the average speaker of a language might not have access to this specialized kind of knowledge. Many nominal kinds, on the other hand, may well be susceptible to a definition in terms of a functional attribute. Thus, a toy may be defined as anything that a child can play with, a weapon is some instrument we can use to physically harm another, a vehicle is anything which provides us with a means of transportation. These criterial attributes obviously set a limit on which kinds of entities can belong to the respective categories. Consider, as another example, the notion of murder. A minimal definition of the word *murder* would surely include the information that a person dies, and that this death is the result of an unlawful act by some person or persons. If either of these conditions is not met, we are not entitled to speak of a 'murder' having taken place.

But is not the presence of essential attributes—attributes which are necessarily shared by all members of a category—inconsistent with the prototype approach? The answer is, not necessarily. The existence of an essential attribute, perhaps even of a set of essential attributes, does not of itself lead to all-or-nothing membership in a category. The criterial attributes themselves might display degrees of membership. Murder, as we have said, requires a death. While it is a relatively clear-cut matter (barring obviously marginal

cases) to state whether or not a person has died, it is far from clear-cut to determine, in any particular instance, whether death occurs as a result of the behaviour of an aggressor. If the victim dies instantly of injuries inflicted on him, there would be little doubt about whether a death, in the required sense, has occurred. But as the causal chain linking the act of aggression and the death of the victim grows more tenuous, it becomes less and less clear what value to assign to the attribute. Suppose a person dies only many years after having been injured. Can we state with confidence that an essential attribute of murder (i.e. the death of a victim as a result of an aggressive act) has been fulfilled? The point can also be illustrated with reference to what constitutes a triangle. One tends to think of geometrical figures as Aristotelian categories *par excellence*. Thus a triangle is a figure enclosed by three straight lines. That this definition deals in essential attributes does not of itself guarantee that membership in the category will be clear-cut. While the number of sides to the figure might well be a matter of either-or, the straightness of these sides is a matter of similarity to a prototype. Suppose I draw a triangle, freehand. The sides will almost certainly not be straight; they might not even join up. The figure would not be a very good example of a triangle. Yet it could still be called a triangle, and could serve as an adequate illustration of the meaning of the word *triangle* in a foreign language classroom.

Does then the existence of a clear boundary to a category preclude prototype categorization? Again, the answer must be, not necessarily. If the essentiality of attributes may be relevant to some nominal kind categories, the presence of a clear boundary is often characteristic of natural kind categories. We have seen that DOG does not merge at its periphery with CAT. Similarly, what counts as gold or silver clearly is a matter of either-or; the one substance does not merge into the other, in the manner of Labov's cups and bowls. Arguably, BIRD is also clearly circumscribed. While penguins might not be very good examples of the category, they are birds none the less. In this connection, Lakoff (1987*b*) has spoken of degrees of 'representativity' within a category, rather than degrees of membership; prototype effects superimpose a 'secondary gradience' on what is essentially a clear-cut category. However, the apparently clear-cut nature of (some) natural kind categories is clearly contingent on a number of factors. Firstly, there are our prevailing beliefs about what natural kinds are. The very notion of a natural kind implies a scientific (or folk-scientific) taxonomic classification of certain naturally occurring phenomena—plants, birds, minerals, etc.—into discrete categories. Secondly, the clear boundary of a natural kind category is dependent both on the way the world happens to be, and on what we happen to know about it. It may be the case that what are called birds do constitute a clearly circumscribed category. But if now extinct species had survived (and how can we be certain that they haven't?), it could have been otherwise. And, certainly, some natural kinds are not discrete. Consider the phenomenon of ring species, discussed by Lakoff (1987*b*: 190) and briefly mentioned by Cruse (1986: 71 f.). The ability

of members of a population to interbreed is usually taken as a defining characteristic of a species. On this criterion, species usually do emerge as clear-cut entities. Suppose, however, that members of a population *A* can interbreed with members of a territorially contiguous population *B*; members of *B* can interbreed with members of *C*, *C* with *D*, and so on. But members of *A* cannot interbreed with members of *D*. Where, in such a case, would one say that the one species ends and the other begins? Neither have our beliefs about the discreteness of natural kinds always been as strong as they are today. Consider the boundary between man and not-man. Edmund Leach (1982) points out that a major driving force for anthropology over the centuries has been precisely the question whether or not human beings fall into a discrete category.

Perhaps the most appropriate way to end this section is to suggest, with Geeraerts (1989), that prototypicality is itself a prototype category (the recursivity of prototypes again!). One characteristic of prototype categories is that their boundaries are fuzzy. Colour categories, such as RED, and some categories of artefacts, such as CUP and VASE, display this property. But boundary fuzziness cannot be regarded as a defining feature of prototype categories. Some categories have clear boundaries (many natural kinds) and some categories have essential conditions for membership (some nominal kinds). Yet these categories can certainly show prototype effects, in that certain members are regarded as better examples than other members.

## 4.2  Prototypes and schemas

Prototypes, and extension from a prototype, play an important role in the work of several linguists, such as Jackendoff (1983), Croft (1991), and Langacker. Here, I want to focus on the position taken by Langacker (1987). For Langacker, extension from a prototype coexists with a second principle of category structure, elaboration of a schema.[2] The difference is explained as follows:

A prototype is a typical instance of a category, and other elements are assimilated to the category on the basis of their perceived resemblance to the prototype; there are degrees of membership based on degrees of similarity. A schema, by contrast, is an abstract characterization that is fully compatible with all the members of the category it defines (so membership is not a matter of degree); it is an integrated structure that embodies the commonality of its members, which are conceptions of greater specificity and detail that elaborate the schema in contrasting ways. (Langacker 1987: 371)

Schemas may be hierarchically organized within a category, in conjunction with extension from prototypes. Consider Langacker's account of how the

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[2] Langacker's schemas appear to coincide, in many respects, with Hudson's (1984) models, Langacker's 'elaboration of a schema' being paralleled by Hudson's 'inheritance from a model'.

concept "tree" might be acquired (1987: 373 ff.). Let us suppose that initially, the language learner associates the word *tree* with specific instances of large, deciduous-leafed plants, e.g. with oaks, elms, and maples. The learner then extracts from these instances a schematic representation of what they have in common. We may call this representation TREE$^1$. This representation may now function as a prototype. Pine trees get associated with the category on the basis of similarity with the prototype, even though pine trees are not fully compatible with the TREE$^1$ schema, for example, they don't have leaves. Once pines are associated with the category, a further schema can be extracted, TREE$^2$, which represents what is common to TREE$^1$ and pines, e.g. a tall central trunk with branches. TREE$^2$ now functions as a prototype for extension of the category to palm trees; palms share with the prototype a tall central trunk, they do not, however, branch. The commonalities between TREE$^2$ and palms permit the extraction of a more abstract schema still, TREE$^3$. Further elaboration of the category is possible. FRUIT TREE, for example, may emerge as a sub-schema of TREE$^1$, while TREE$^2$ may function as a proto-type for metaphorical extension, e.g. genealogical trees and the phrase structure trees of linguistic description get associated with TREE$^2$ on the basis of their branching structure. We can even propose a 'superschema' TREE$^4$ which is schematic for all these tree concepts. These relations are sketched in Fig. 4.1.

We should not think of categorization by schema and categorization by prototype as opposed to each other; rather, they present complementary aspects of the same phenomenon. With respect to dogs, for example, 'a shape specification schematic enough to neutralize the differences between an

**Fig. 4.1.** Structure of the "tree" category.
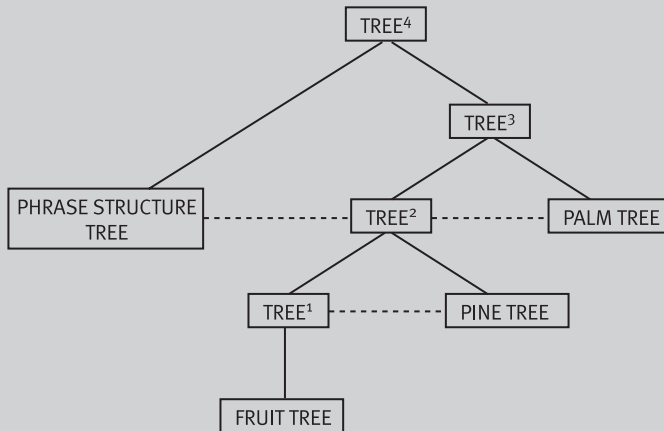
Alsatian and a poodle, while still being recognizable as that of a dog'
(Langacker 1987: 136 f.) may coexist with 'the more precise shape specification
of a prototypical dog', other shapes being recognized as extensions from the
prototype. In the case of categorization by prototype, an entity is associated
with a category on the basis of its similarity with a prototype. At the
same time, the similarity between the two entities may be the basis for the
abstraction of a schema, with which both the prototype and the extension
are fully compatible. Both prototype and schema may therefore coexist
within the mental representation of a category. It is certainly possible, indeed
highly probable, that speakers of English subsume trees (of the biological
kind) under the schematic representation TREE[3]. It is conceivable, though in
this case less probable, that speakers bring biological trees and metaphorical
trees under the even more abstract representation TREE[4]. But these schematic
representations do not conflict with the structuring of the category around
a more specific prototype representation. Indeed, without the notion of the
prototype, it would be difficult to explain the widespread existence of proto-
type judgements.

In this book I shall emphasize categorization by prototype rather than
categorization by schema. There are a number of reasons for this approach.
Firstly, for many categories of natural language, it may not be possible at all
to abstract a schema which is compatible with *all* the members of the category.
Some striking examples will be discussed in later chapters. Even if a schema of
sufficient generality can be extracted, the schema might not be restrictive
enough, and would therefore be unable to predict just which entities are
members of the category. Consider the abstract tree-schema, TREE[4], which
encompasses oak trees, pine trees, family trees, and phrase structure trees.
What these different kinds of tree have in common is the fact that they branch,
in some sense. Yet not everything that branches is a tree; one could not,
for instance, refer to a road branching at a Y-junction as a tree, even though
the branching road would appear to be just as compatible with the schema
as a syntactic tree diagram. With respect to TREE[4], it is therefore essential
that at least some of the instances of the schema are specifically represented
as such. My second reason for focusing on prototypes has to do with
Langacker's observation that categorization by prototype and categorization
by schema give rise to different predictions concerning degree-of-membership
judgements, i.e. with categorization by schema 'membership is not a matter
of degree'. We have seen in the last chapter, however, that for many cate-
gories, membership clearly *is* a matter of degree. Thirdly, while recognizing
that speakers can and do structure categories by schema, I would suggest that
categorization by prototype occurs developmentally prior to categorization
by schema. (See Chapter 14, Section 4, for further discussion.) The
increasing abstractness required of schematic representations suggests that
schemas may only be accessible to more sophisticated, reflective
language users. Possibly, one of the hallmarks of formal education is precisely

that it encourages an individual to reflect consciously on the commonality of category members.

## 4.3  Folk categories and expert categories

In this section I would like to discuss some empirical data which would appear to jeopardize the prototype view of categories I am putting forward, and to consider some of the ways in which the data can be accommodated within the present approach. The data in question are reported in Armstrong *et al.* (1983). Employing Rosch's technique for eliciting degree of membership judgements, Armstrong *et al.* investigated the structure of the categories ODD NUMBER and EVEN NUMBER. Subjects were given a series of odd and even numbers, and were asked to rate these numbers for their degree of membership in the respective categories.

If there do exist categories which are structured according to the assumptions of the classical theory—i.e. categories which are defined in terms of necessary and sufficient conditions, which exhibit clear-cut boundaries, and which permit only two degrees of membership (i.e. member and non-member)—then ODD NUMBER and EVEN NUMBER are surely amongst them. An even number is a natural number which is divisible by 2 without a remainder; odd numbers, when divided by 2, leave a remainder of 1. Clearly, a number must be either odd or even; one even number cannot reasonably be considered more even than another. One would therefore expect that subjects, given the task of assigning degrees of membership in the categories ODD NUMBER and EVEN NUMBER, would judge all numbers to be optimal members of the respective categories.

This is not what Armstrong *et al.* found. Of the various odd numbers tested, 3 was assigned the highest degree of membership in the category, with a mean value of 1·6; 447 and 91 had the lowest degree of membership, with a value of 3·7. Even numbers showed the same effect. 2 and 4 had the highest degrees of membership in the category EVEN NUMBER, with degrees of membership of 1·0 and 1·1; while 106 and 806 had lowest membership, with a value of 3·9. Admittedly, none of the numbers tested scored less than 4 (= moderately good example) on Rosch's scale. (ODD NUMBER and EVEN NUMBER are therefore not particularly good examples of prototype categories.) Yet the fact that graded responses were obtained at all for what seem to be undeniably clear-cut categories, puts in question the validity of one of the primary sources of evidence for prototype categories.

Armstrong *et al.*'s explanation of their findings is worth considering in some detail. Following Osherson and Smith (1981)—who had also questioned the theoretical import of prototype effects—Armstrong *et al.* propose, Rosch's research notwithstanding, that categories continue to be defined in terms of core, or categorial features. These features define the 'real essence' of a

category. The real essence of ODD NUMBER—what an odd number 'really is'—is given by the mathematical definition. Alongside the core definition, however, there exists an 'identification procedure', or 'recognition procedure'. The identification procedure might well rely on properties of an entity which are accidental to its real essence. As Osherson and Smith put it:

> the core [of a concept] is concerned with those aspects of a concept that explicate its relations to other concepts, and to thoughts, while the identification procedure specifies the kind of information used to make rapid decisions about membership. . . . We can illustrate with the concept *woman*. Its core might contain information about the presence of a reproductive system, while its identification procedures might contain information about body shape, hair length, and voice pitch. (Osherson and Smith 1981: 57)

Let us pursue the implications of this distinction by considering, first, the category NUMBER. Although, from the point of view of a mathematician, any (positive whole) number is just as much a number as any other number, i.e. NUMBER is an ungraded category, non-mathematicians in the course of their daily lives do not experience numbers as having equal status (cf. Lakoff 1987*b*: 150 f.). We speak of small numbers more frequently than large numbers; we compute with high numbers by dealing with them on a digit by digit basis; high numbers are generally understood in terms of their proximity to 'cognitive reference points', such as 500, 1,000, 5,000, of our decimal counting system (cf. Rosch 1975*a*); and to determine whether a number is odd or even we know that all we have to do is look at the final digit. It is also important to remember that numbers as such are abstractions. We encounter numbers, not of themselves, but as attributes of groupings of objects. An odd number of objects is one that cannot be divided equally amongst two persons. Taking into account how people normally interact with numbers, it is really not so surprising that a single digit like 3 should be judged a better example of ODD NUMBER than 447—one can readily visualize the impossibility of dividing a set of three objects equally between two people. Nor, given the way we compute with our decimal counting system, is it at all strange that a cognitive reference point like 1,000 should be considered a better even number than 806.

The distinction between core definition and recognition procedures makes it possible, in principle, to preserve the classical theory of categorization without at the same time ignoring the empirical evidence for prototype categorization. We simply say that prototype effects are a consequence of recognition procedures, while the classical theory looks after the core definition.[3] The distinction also fits in nicely with the modularity assumption of the generative

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[3] Cf. Hudson's remark that 'the "fuzziness" of a prototype-based concept lies . . . in the deviations which the world allows between it and its instances' (1984: 40).

paradigm. The core definition deals in abstract linguistic features, and can thus be said to constitute the purely linguistic meaning of a word, while proto-type effects arise from an interaction of core meaning with non-linguistic factors like perception and world knowledge, and can thus be assigned to non-linguistic modules of the mind. The reader will have perhaps noticed, in the passage from Osherson and Smith quoted above, the eminently structuralist statement that it is the core which explicates the relation of a concept to other concepts, and its relation to 'thoughts'. What is meant here, presumably, is that it is on the basis of the core meanings of words that sentences can be regarded as analytic or synthetic, and that the semantic relations of entailment, synonymy, and contradiction can be established (cf. pp. 28–9).

A nice illustration of how autonomous linguistics can remain impervious to empirical evidence which threatens the categorization principles on which it is grounded is provided by Geoffrey Leech's *Semantics*. The first edition of the book, published in 1974, makes no reference to Rosch's work on categorization. Leech is aware that many natural categories do have fuzzy boundaries, and recognizes the potential damage of this fact for his structuralist-oriented componential analysis. As a 'dedicated componentialist' (1974: 124) Leech therefore feels obliged to account for fuzziness within a componential model. One of his proposals invokes the only partial overlap of closely related poly-semous senses. Thus, addressing the question whether *boast* does or does not contain the component [UNJUSTIFIED (SELF-PRAISE)], Leech suggests two componential analyses, one with the component, the other without. Fuzziness results from uncertainty as to which of the two senses is meant. In the second edition of the book, published in 1981, this highly unsatisfactory account has been deleted. Leech takes cognizance of Rosch's work and is able to state that fuzziness is merely a matter of 'referential vagueness', having to do with 'category recognition' (1981: 120); the core definition of categories remains intact.

Armstrong *et al.* were surely correct to attribute the prototype effects of odd and even numbers to identification procedures. What may be questioned is whether there exists a core definition independent of recognition procedures. Chomsky put his finger on the heart of the problem when he wrote that word meaning is intimately bound up with matters of knowledge and belief (1980: 225). Inevitably, matters of knowledge and belief are involved in a speaker's identification and recognition of an entity as a member of a certain category. But can one legitimately claim that there exists a definition of a category independent of such factors? Could one legitimately define *odd number* independently of the attributes of odd numbers that people appeal to when identifying something as an odd number?

Even accepting the validity of this argument, we are still left with the task of explaining the tension between the prototype effects shown by odd and even numbers and the clear intuition that odd numbers and even numbers do not

constitute fuzzy categories. In point of fact, the same kind of tension shows up with other categories, as well. As noted earlier, penguins are more marginal members of BIRD than robins; at the same time penguins are just as much birds as robins. We can approach this issue by returning to Langacker's distinction between categorization by prototype and categorization by schema. Categorization by schema does not give rise to degree-of-membership judgements. We might hypothesize, therefore, that the intuition of all-or-nothing membership in certain categories reflects the existence of an abstract schematic representation of the category. The coexistence, within one and the same speaker, of alternative representations of a category, one involving a prototype, the other involving a schema, would thus account for the tension mentioned above.

I suggested in Section 4.2 that categorization by prototype occurs developmentally prior to categorization by schema. Categorization by schema presupposes a fairly sophisticated ability on the part of a language user to extract from diverse members of a category an abstract representation of what the members have in common. But schemas can not only be extracted from categories, schemas can also be imposed. Consider, for example, the word *adult*. On the one hand, we determine whether someone is an adult by appealing to such criteria as emotional maturity, financial independence, and, within a rather broad range of values, age. But coexisting with this rather fuzzy understanding of what it means to be an adult is an imposed definition, that of the bureaucrats, according to which a person becomes an adult on their eighteenth birthday, or whenever. Categories defined by the imposition of a set of criteria for category membership I shall refer to as **expert categories**, in contrast to the **folk categories**, or 'natural categories', of everyday use. Folk categories are structured around prototypical instances and are grounded in the way people normally perceive and interact with the things in their environment. On the other hand, expert categories (what Kempton 1981 calls 'devised classification systems'—note that I am using the word 'expert' in its folk sense: experts are people who, because of their professional standing, are 'supposed to know' about their relevant field) have been specifically created, usually in conformity with Aristotelian principles, i.e. the categories have necessary and sufficient conditions for membership, such that the relevant experts are competent to say whether, and on what grounds, any particular instance is or is not a member of the category. Indeed, one of the main activities of experts in many walks of life is precisely the 'drawing of boundaries' (cf. Wittgenstein 1978: 33) around essentially fuzzy categories, and the formulation of criteria on which membership is to be decided. The discipline of linguistics is no exception. Think, for example, of the technical definitions, put forward within the generative linguistic tradition, of such concepts as grammaticality and language. (Grammaticality is a property of those sentences generated by the grammar of a language, while a language is defined as the set of sentences generated by the grammar.) The definitions serve

to eliminate the fuzzy edges from the categories, giving them the status of technical, rather than merely pre-theoretical constructs.[4]

Relevant to the distinction I am drawing between expert and folk categories is Putnam's (1975) notion of the **division of linguistic labour** within a speech community. Most speakers of English know, through the general diffusion of scientific knowledge, that water is $H_2O$ and that gold is an element with a particular atomic structure. But a person can use the words *water* and *gold* correctly and appropriately, without having first to acquire the skills necessary for determining whether something 'really is' $H_2O$ or Au. The ordinary speaker of English identifies something as water or gold largely on the basis of what Putnam calls a **stereotype**.[5] Water is a clear tasteless liquid, gold is a yellowish malleable metal; water comes out of taps and is found in rivers and lakes, gold is a component of certain items of jewellery bought from reputable dealers. At the same time, the English speaker knows that there is a body of experts in society, namely chemists and metallurgists, who are professionally competent to determine whether something 'really is' water or gold or whatever. If knowledge of the 'real essence' of water and gold were a prerequisite for the use of the words *water* and *gold*, then only a few specially trained experts would be competent to use these words. And how could the words have been used before the rise of modern chemistry? To be sure, some words are indeed restricted to use by experts—words like *phoneme* and *allophone* occur only in the expert discourse of phoneticians and linguists. Other words do not have expert definitions at all—words like *chair* and *cup*. Before the rise of modern science, *water* and *gold* were also words without expert definitions.

Putnam, then, is proposing that at least some words in our vocabulary are subject to both expert and folk definitions, the former having to do with necessary and sufficient conditions for category membership, the latter relying on our knowledge of perceptual and interactional attributes of prototypical instances. Generally, there is a 'structured cooperation' between expert and non-expert, in that the experts' definitions provide a kind of guarantee for appropriate linguistic usage in the speech community as a whole. This cooperation does not preclude the possibility of conflict. The folk definition of gold would probably refer to its 'golden' colour. This colour, though, is not an essential attribute of the metal. On the contrary, pure gold is yellow;

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[4] Fascinating attempts to remove the fuzziness from the folk categories of natural language may be observed in the daily practice of the legal profession. Arguably, many legal decisions have to do, essentially, with the categorization of entities on the fuzzy borders of natural categories. On what basis, for example, does one decide whether a particular sequence of events constitutes an accident (a matter of obvious concern to the insurance industry), whether a certain transaction counts as fraud, or whether abortion and euthanasia are instances of murder. Confronted with such questions, it is the job of the legal profession to stipulate whether the category is instantiated or not, i.e., in Wittgenstein's words, to 'draw a boundary' around the category.

[5] Putnam's stereotypes appear to be rather broader constructs than what I have been calling prototype representations, in that they comprise, not only the prototype, but also frame-and-script based information which provides the context for a prototype representation. See s. 5.3.

only when alloyed with other metals, such as copper, does gold have its characteristic golden colour.

We can now return to the starting-point of this discussion. Odd and even numbers can be characterized in two ways. On the one hand there are the expert definitions, those of the mathematicians. Speakers with only the most basic education have been made familiar with the expert definitions. In their daily encounters with numbers and with groupings of objects, however, people still operate with a more informal, experience-based understanding of odd and even numbers. The expert and the folk characterizations coexist, not only in different sections of the speech community, but, typically, within individual members of the community. This state of affairs, I have suggested, is by no means unusual; cf. the earlier remarks on BIRD and ADULT. For a final example, consider Langacker's highly pertinent remarks on the concept 'circle'. On the one hand there is the expert definition, involving the notion of a series of points in a plane all equidistant from a central point. But coexisting with the expert definition is a more naïve understanding of what a circle is:

Anyone who has studied geometry is familiar with [the] definition [of circle] as the set of points in a plane that lie at a specified distance from a reference point . . . But despite the mathematical elegance of this characterization, it is doubtful that it reflects a person's naive or primary understanding of [CIRCLE]. Many people (e.g. young children) acquire [CIRCLE] as a salient and deeply entrenched concept without ever being exposed to the mathematical definition or focusing their attention specifically on the length of line segments from the center to the circumference. [CIRCLE] is probably first learned as a shape gestalt: it is the simplest or minimal closed curve, lacking any dimensional asymmetries or any departures from a smooth trajectory as one traces along its perimeter. (Langacker 1987: 86)

Of the two characterizations of circle, it is the naïve understanding that is developmentally basic. As Langacker observes in a footnote 'the mathematical definition may be irrelevant to how the concept [CIRCLE] is learned and represented by the geometrically naive' (1987: 87). Subsequent exposure to the mathematical definition need not displace the naïve understanding, although it might enrich a person's encyclopaedic understanding of the notion. So it is with odd and even numbers. Even though we can all state the expert definitions of odd and even numbers, we still operate, in some contexts, with the naïve understanding. It is the tension between the naïve and expert understandings which gives rise to the (at first sight highly bizarre) experimental findings of Armstrong *et al.*

## 4.4 Hedges

The belief that categories *are* definable in terms of what their members have in common is deeply ingrained; it is not only the dominant expert theory of the nature of categories, it also constitutes 'our everyday folk theory of what a

category is' (Lakoff 1987*b*: 5). There are many reasons for the persistence of this belief. I have already mentioned the role of formal education in imposing expert definitions. Another possible factor is the authority of the biblical creation story. Genesis teaches us that 'species are fixed entities established by God' (Leach 1982: 72); the creatures were created 'after their kind', and the kinds were given names by Adam. Adam's naming of the kinds points to the role of language itself in the enduring fortune of the classical theory. Language itself imposes an either-or categorization. Thus, in the real world of objects, as Labov's (1973) experiment showed, cups might well merge into bowls, yet the lexical items *cup* and *bowl* do not merge into each other. Either one uses the word *cup* to refer to a particular receptacle, or one does not. Similarly, the pastness of an event with respect to the present (a factor involved in the selection of the past tense, in one of its senses, in English) is a continuum, yet a speaker of English must make a discrete choice between the past tense and a non-past tense. One cannot convey degrees of pastness by varying the pastness of the past tense. In other words, the lexical and syntactic resources of a language can be said to impose a digital, rather than an analogue, encoding of experience.   Wittgenstein alluded to this matter in the *Philosophical Investigations* (1978: 48): 'A *picture* held us captive. . . . It lay in our language and language seemed to repeat it to us inexorably.' The very fact that the word *game* is used to refer to a range of different activities easily creates in us the belief that the activities *must* have something in common, otherwise why call them the same?[6]

But it is not the case that language in all circumstances inexorably compels us to undertake an all-or-nothing categorization. Language possesses its own resources for expressing degree of category membership. Kempton (1981: 27ff.), in his study of the categorization of footwear, noted that it was not necessary to devise sophisticated experiments in order to elicit prototype judgements; the evidence was there in the way his informants spoke about the objects. Some shoes were 'typical' (i.e. prototypical) shoes, some boots were not as 'booty' as other boots, but boots nevertheless (i.e. they were more marginal members of the category), one particular shoe could be singled out as 'the most typical'. Some examples from his protocols:

The most typical shoe is [item 38]; it has been the same through the ages, you can always get a black, lace-up shoe.

[Item 29] is a boot, but in the context of these big boots, you wouldn't say it was as booty, even though it is of the same style.

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6   An interesting sidelight on this issue is given by Edmund Leach (1964). Leach argues that while language imposes discrete categories on the continuity of the world, there are nevertheless certain phenomena in the world that refuse to be neatly categorized, as demanded by language. One of the most basic distinctions is between 'me' and 'not-me'. The distinction, in general clear enough, is threatened by certain substances of ambiguous status. Is excrement, for example, me or not-me? In order that we may keep our categories distinct, these ambiguous phenomena have to be suppressed, i.e. they become subject to taboo.

[Item 38] is really the most typical shoe, it's the kind you would expect to see in a children's book, with 'shoe' written under it.

[Item 27] is a boot's boot.

Amongst the resources of a language which enable speakers to express degree of category membership are words and expressions that Lakoff (1972) has called **hedges**. Lakoff lists over sixty English hedges in his paper. (The list is not exhaustive.) From a formal point of view, hedges form a highly heterogeneous group. They include sentence adjuncts like *loosely speaking* and *strictly speaking*, conjunctions like *in that*, modifiers like *so-called*, and even graphological devices like inverted commas, as well as certain intonation patterns (as when one talks of *a 'liberal' politician*). Semantically, we can characterize hedges as linguistic expressions which speakers have at their disposal to comment on the language they are using. Just as the word *chair* is 'about' chairs, so hedges are 'about' language (Kay 1983). For this reason, a careful study of hedges is likely to turn up valuable information on the nature of language itself. The remaining part of this chapter will examine some of the hedges discussed by Lakoff, and discuss their role in structuring categories.

Compare the following sentences:

(**1**)  A robin is a bird *par excellence*.
(**2**)  ?A turkey is a bird *par excellence*.

Sentence (2) is odd. It is not that a turkey is not a bird, only that it is not a bird *par excellence*. Turkeys exhibit a range of attributes not shared by prototypical birds: they can't fly, they don't sing, they are quite large, and they are raised in captivity for food. *Par excellence* is a hedge, whose function is to pick out only the central members of a category. One could say that the hedge restructures BIRD in such a way that the category consists only of prototypical, or close to prototypical members. To this extent (2) is false, since turkeys are not proto-typical birds. That *par excellence* can function in this way at all rests on the fact that the unhedged BIRD-category is a category with different degrees of membership.

Other hedges restructure categories by extending their boundaries. *Loosely speaking* is an example:

(**3**)  ?Loosely speaking, a chair is a piece of furniture.
(**4**)  Loosely speaking, a telephone is a piece of furniture.
(**5**)  *Loosely speaking, a six-sided figure is hexagonal.
(**6**)  Loosely speaking, France is hexagonal.

Here it is (3) and (5) that are odd, since chairs are a pretty good example of furniture, and a six-sided figure is hexagonal, period. A telephone, on the other hand, is a pretty marginal example of furniture (if indeed it is a piece of furniture at all), while the frontiers of France trace only a very rough

approximation to a hexagon. *Loosely speaking* signals that very marginal members, and indeed non-members, are being drawn into the category, on the basis of some tenuous similarity with more established members.

*Strictly speaking* is similar, in that this hedge is also incompatible with more central members of a category:

(7)  ?Strictly speaking, beans are vegetables.
(8)  Strictly speaking, rhubarb is a vegetable.

In a sense, *strictly speaking* tightens up a category. It removes the fuzziness from category boundaries, by imposing a 'strict' application of definitional features to non-central members, and giving them full status. *Loosely speaking*, in contrast, extends the category by accommodating things that would not ordinarily be considered members, but which might nevertheless be associated with the category on the basis of one or two non-essential attributes which they share with it. The contrast between the two can be seen in the following:

(9)   A bat is a bird. (false)
(10)  Strictly speaking, a bat is a bird. (false)
(11)  Loosely speaking, a bat is a bird. (true, or at least not patently false)

We see from (11) that it is possible to hedge a statement in such a way that what would normally be considered a falsehood becomes true, or at least true to a certain extent. Some readers still might not accept (11), in spite of the hedge. (11) can be improved by making explicit the reasons for the loose categorization:

(12)  Loosely speaking a bat is a bird, in that it has wings and can fly.

*In that* spells out the reasons for assigning an entity to a category. In (12), it picks out attributes (i.e. flying and having wings) which, although typically associated with a category, would not normally of themselves grant membership to it. At the same time, membership in the category is released from otherwise highly entrenched, one might even say essential, attributes (e.g. laying eggs and having feathers). *In that* has been studied by Herrmann (1975). Although Herrmann makes no reference to prototypes, her examples can be readily interpreted in prototype terms. Consider the following examples:

(13)  *He killed Alice in that he murdered her.
(14)  He killed Alice in that he did nothing to keep her alive.
(15)  She's a friend of mind in that I've known her for years, but we're really not that close.

(13) is odd, since it is not usually necessary to justify the use of *kill* in the case of murder. *Kill* prototypically denotes an action which directly causes loss of life, and murder is a central instance. Sentence (14), however, refers to a non-prototypical instance of killing, i.e. a non-event which leads indirectly to loss

of life. Indeed, one might argue whether doing nothing to keep someone alive is an instance of killing at all. Example (14), therefore, temporarily restructures, or even redefines the category, stating the new conditions for membership in it and overriding attributes typically associated with it. Similarly, (15) focuses on a single attribute which is frequently associated with friendship (i.e. long acquaintance), but which does not of itself guarantee friendship; a highly entrenched attribute of friendship, i.e. close personal relationship, is cancelled.

So far, I have dealt only with hedges in terms of the status of members in a category. Hedges also serve to differentiate between various non-members of a category. (Recall that in the classical theory not only do all members of a category have equal status, so do all non-members of a category.) Some entities, while not belonging to a category, are nevertheless felt to be closer to it than other non-members:

(**16**)  Strictly speaking, a bat is not a bird.
(**17**)  *Strictly speaking, a TV set is not a bird.

Neither bats nor TV sets are birds. Bats nevertheless exhibit some attributes of birds (but not enough attributes, or attributes of sufficient weight, or attributes of the appropriate kind, for them to qualify strictly as birds), such that an inattentive or naïve observer might possibly categorize a bat incorrectly as a bird. TV sets, on the other hand, have nothing whatsoever in common with birds. The hedge *as such* functions in a similar way:

(**18**)  An octopus is not a fish as such.
(**19**)  *A bicycle is not a fish as such.

The fact that an octopus lives in the sea is not sufficient for it to be categorized as a fish. On the other hand, there is no way in which a bicycle might be categorized, even loosely, as a fish.

Consider, finally, the hedge *technically* (*speaking*). *Technically*, like *strictly*, removes the fuzziness from a category, and in many contexts the two hedges are interchangeable. There is, though, an important difference. This is that *technically* invokes a technical, or expert definition of a category, setting it off against the folk definition. Consider the following example, from Lakoff's 1972 paper:

(**20**)  Ronald Reagan is technically a cattle rancher.

When Lakoff wrote this paper, Ronald Reagan was Governor of California. In order to take advantage of tax concessions, he bought cattle stocks. From the point of view of the experts (i.e. the tax authorities), Reagan was a cattle rancher. But he was not a cattle rancher in terms of the folk definition, i.e. he did not engage in the kinds of activities that people normally associate with cattle ranching. Indeed, it is doubtful whether one could say that Reagan, either *loosely speaking* or *strictly speaking*, was ever a cattle rancher.

Let us take stock of the discussion so far. According to the classical theory of categorization:

(a) all members of a category have equal status;

(b) all non-members of a category have equal status;

(c) there is a fixed set of necessary and sufficient conditions defining membership in each category;

(d) the necessary and sufficient features defining a category have equal status;

(e) category boundaries are fixed.

Hedges have provided evidence, from within the language itself, that none of these assumptions is true. Hedges require us to distinguish between central and peripheral members of a category (*par excellence, strictly speaking*), as well as between different degrees of non-membership in a category (*strictly speaking*). They show that category boundaries are flexible (*loosely speaking*), and that categories can be redefined by an *ad hoc* selection and re-weighting of attributes (*in that*). Furthermore, hedges can pick out cases where, exceptionally, categories *are* being defined by classical principles (*technically*), although in doing so they at the same time imply a contrast with non-classical categorization. In a very important sense, then, hedges both confirm and complement the psycholinguistic evidence reviewed in the preceding chapter.

## Study questions

**1.** The case of the disappearing prototypes. As a concept gets specified in greater detail, the relevance of the prototype tends to diminish. For example, you might have an image of the prototypical grandmother as a kindly, grey-haired, frail old lady, who lives alone with her cats and who tends her rose bushes. But when you think of *your* grandmother (you might even be a grandmother yourself), the prototype is overridden by more specific information. In light of this example, consider the possibility that a prototype constitutes a default specification—in the absence of specific information, the various attributes of an entity are given expected, or stereotypical values. How, for example, would you interpret a statement that 'we had fruit for dessert', or that we 'bought some toys for the children'? What kinds of fruit, and which kinds of toys, come to mind? Do the examples which come to mind correspond to the prototypes of FRUIT and TOY? Could these interpretations in terms of prototypes be overridden by more specific information?

**2.** The problem of the pet fish. On the classical view of categories, the category PET FISH would be defined in terms of the intersection of entities that are pets

and those which are fish, that is, a pet fish is a pet which is a fish, or (which amounts to the same thing) a fish which is a pet. The classical view might be able to circumscribe the range of things which count as 'pet fish', but it runs into problems with prototypes. Thus, the prototype of a pet fish might be a goldfish, which you have in a fish tank in the lounge. The prototype, however, cannot be derived from the classical definitions. The prototype view also runs into problems. A prototypical example of FISH might be a herring, while the prototypical example of PET might be a cat or a dog. Yet the prototype of PET FISH (a goldfish) is neither a prototypical fish, nor a prototypical pet.

How might one resolve this conundrum? (The pet fish problem was raised by Osherson and Smith 1981).

**3.** Reduplication. What is the effect of reduplication in examples such as the following? To what extent does reduplication restructure the categories in question? In what ways? Are the examples open to more than one interpretation?

You make the fruit salad, and I'll make the salad-salad.
Is he Canadian-French, or French-French?
Are you Irish-Irish?
She's my girlfriend, not my girlfriend-girlfriend.
Is he a linguist, or a linguist-linguist?
I've got a headache, not a headache-headache.
Would you like to come up for some coffee? — I mean coffee, not coffee-coffee.


# Further reading

For arguments against the prototype concept, see Armstrong *et al.* (1983), Osherson and Smith (1981), Smith and Osherson (1984), and Fodor (1998: ch. 5). For counter-arguments, see Lakoff (1987*b*: ch. 9).

CHAPTER 5

# Linguistic and Encyclopaedic Knowledge

In previous chapters we encountered cases where it seemed that the meaning of a linguistic form could only be characterized against specific cultural norms or practices. Various attributes of cups have to do with cultural norms for drinking hot liquids; *bachelor of arts* only makes sense in the context of institutions of higher learning and their procedures for granting degrees; even in the sense "man who has never married" *bachelor* needs to be understood against the cultural institution of marriage. The understanding of terms like *cup* and *bachelor* thus presupposes a certain amount of world knowledge on the part of the language user. In this chapter, we explore in more detail the relevance of background knowledge, and consider the ways in which this kind of knowledge can be incorporated into the characterization of word meanings.

## 5.1  The dictionary and the encyclopaedia

Autonomous linguistics assumes a clean separation between a speaker's world knowledge and his purely linguistic knowledge. 'Meaning *per se*', as Leech (1981: 70) calls it, is held to be independent of whatever states of affairs might hold in real or imaginary worlds, and independent of whatever a speaker of a language might know about these states of affairs. The mental dictionary, the slogan goes, is not an encyclopaedia. There are many problems associated with this approach (for a critique, see Haiman 1980), not the least of which is the problem of demarcation. Where, and on what criteria, do we draw the line between what a speaker knows in virtue of his knowledge of a language and what he knows in virtue of his acquaintance with the world? The problem shows up in a particularly acute form in connection with the analytic–synthetic distinction (cf. p. 29). In terms of this distinction, one would presumably say that sentence (1) is analytic, i e. that the sentence is true in virtue of the conjunction of semantic features[1] which define the (purely linguistic) meanings of the words *dog* and *animal.*

(1)  Dogs are animals.
(2)  Dogs have four legs/have a tail/bark/do not miaow/do not have horns, etc.

But what about (2)? Are these sentences true in virtue of the meaning of *dog*, or in virtue of our knowledge of what dogs happen to be like? Leech (1981: 83 f.) argues that to say that the sentences in (2) are analytic would amount to adding the features [POSSESS FOUR LEGS], [POSSESS TAIL], [−POSSESS HORNS], etc. to the set of necessary and sufficient features defining the category DOG. But to add these features is to make way for an indefinitely long definition of the category; the definition would have to include the features [POSSESS FUR], [POSSESS SNOUT], [−POSSESS WINGS], and countless more. The solution, for Leech, is to restrict the purely linguistic, dictionary definition of *dog* to "animal of the canine species", i.e. to the feature set [ANIMAL] and [CANINE], and to leave everything else one knows about dogs to the zoologist.

And, indeed, it would seem to make sense to claim that dogs do not *have* to have four legs in order to be dogs. Possession of four legs is merely an expected attribute of dogs, not a defining feature of the category. (Thus a dog, one of whose legs has been amputated, is still a dog.) But is the situation with regard to (1) really all that different? The extended discussion of analyticity conducted by the philosophers Quine, Kripke, and Putnam (see Pulman 1983 for an overview) suggests that it is not. Our conviction that (1) is necessarily true is a consequence of deeply entrenched beliefs about the inner constitution of the natural kinds dog and animal, and about the manner in which the kinds are

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[1] Recall (Ch. 3 n. 1) that the term 'feature' is being used to refer exclusively to conditions for membership in classical, Aristotelian categories.

related in a taxonomic hierarchy. Suppose that, as a consequence of scientific discoveries, our understanding of life forms were to undergo radical change, resulting in a major re-classification of biological kinds. In case this should seem a rather far-fetched idea, bear in mind that restructuring of natural kind categories has occurred in the past. It is only in comparatively recent times that modern theories of the chemical elements replaced the older idea that the universe was made up exclusively out of the four elements, earth, air, fire, and water. It is therefore not inconceivable that a restructuring of biological kinds might occur in the future. One consequence might be a new understanding of the category ANIMAL, and what it might mean to say of a creature that it 'is an animal'. It might even happen that under this new understanding of what animals are, dogs would cease to be a member of the category. In these circumstances, (1) might cease to be true. The sentence cannot therefore be analytic, in that its truth is ultimately dependent on real-world contingencies, and of our understanding of them. The most we can say, is that the truth of (1) is consistent with our current beliefs concerning the classification of life forms.

These considerations inevitably lead to a view of word meaning which is broadly encyclopaedic in scope. Our concept 'dog' is not independent of our knowledge about dogs. This knowledge not only concerns our beliefs about the status of dogs as a species within the animal kingdom, but also our knowledge about different breeds of dog, about their appearance and characteristic behaviour, their relationship with humans, and so on. This kind of knowledge is the matrix for our mental representation of the prototypical dog, and provides a rationale for delimiting the range of creatures that can be referred to as dogs. Admittedly, an encyclopaedist approach also brings with it a demarcation problem. Clearly, we do not want to say that everything an individual happens to know about dogs will be relevant to a characterization of that person's dog concept. To say that the dictionary is encyclopaedic is not equivalent to saying that the dictionary *is* an encyclopaedia. At the same time, we should not exclude a priori the possibility that different speakers of a language may have somewhat different representations of 'dog'. The specialized knowledge of the dog breeder or the veterinarian, the special concerns of the dog racing enthusiast, or the idiosyncratic knowledge of the dog lover (as well as the strongly felt aversion of the dog hater) may well enter into an individual's characterization of 'dog'. Disregarding these individual differences, we can regard the relevant background information for the characterization of word meanings as a network of shared, conventionalized, and to some extent perhaps idealized knowledge, embedded in a pattern of cultural beliefs and practices.

We shall see that the distinction between the dictionary (the repository of the strictly linguistic meanings of words) and the encyclopaedia (which contains knowledge about the entities designated by words) is problematic, and difficult to maintain, not just because of the difficulties one encounters in

drawing a strict distinction between the two. After all, a prototype semanticist should have no problems in dealing with categories with fuzzy boundaries! A more fundamental reason for rejecting the distinction is that encyclopaedic knowledge is crucially involved in the way in which words are used. The acceptability—and interpretability—of linguistic expressions depends, very often, on the activation of knowledge about the world.

## 5.2 Domains and schemas

We can only understand the meaning of a linguistic form in the context of other cognitive structures. The context-dependence of word meanings was fully recognized by structuralist linguists. For structuralists, however, context-dependence had to do with the syntagmatic and paradigmatic relations between items within the linguistic system, i.e. the context for the definition of a meaning was internal to language itself. Thus, the meaning of *red* is delimited by the existence of contrasting words such as *orange* and *purple*, the meaning of *miaow* is given by its contrast with *bark* and its co-occurrence with *cat*. We saw in Chapter 2 how this eminently Saussurian notion was adopted by a number of linguists, as is evident from the citations from Lyons, Nida, and Cruse. For a further example of the structuralist approach, consider Bickerton's (1981: 230 f.) claim that the meaning of *toothbrush* is delimited by the meanings of other items in the linguistic system, such as *nailbrush* and *hairbrush*. There are some obvious problems with Bickerton's assertion, and indeed with the structuralist approach in general. It is difficult to imagine that if the words *nailbrush* and *hairbrush* did not exist, then the meaning of *toothbrush* would expand in order to take in the concepts designated by these words; or that a person who does not have the words *nailbrush* and *hairbrush* in their vocabulary would understand *toothbrush* differently from those people who do know what nailbrushes and hairbrushes are. The point is that *toothbrush* derives its meaning from the role of toothbrushes in dental hygiene, and not from paradigmatic contrasts with other terms in the language system. The concept 'toothbrush' has nothing whatever to do with the way people clean their nails, adjust their hair, or sweep their floors.

Word meanings are cognitive structures, embedded patterns of knowledge and belief; the context against which meanings are characterized extends beyond the language system as such. To take a simple, though telling example: what is the meaning of the word *Monday*? Clearly, *Monday* can only be explicated in the context of the concept 'week'; someone unfamiliar with the notion of the seven-day week would have no basis for an understanding of *Monday*. 'Week', understood as a sequence of seven days, in turn rests on our conceptualization of the recurring day–night cycle. Ultimately, the concepts day, week, and Monday are understood against the concept of time, specifically, time as measured by the alternation of daytime and night-time. Similarly, *up*

and *down*, *high* and *low*, *rise* and *fall* can only be explicated against the notion of three-dimensional, gravitational space; *in* and *out*, *enter* and *exit* require the notion of a container; *wing* presupposes knowledge of a flying entity (bird or aeroplane), *birth*, *old age*, and *death* presuppose a knowledge of the life cycle, *heavy* requires reference to the notion of weight, and so on, throughout the dictionary.

We shall say, following Langacker (1987: 147 ff.), that the seven-day week is the semantic **domain** against which *Monday* is understood, and that the day–night cycle is the domain for an understanding of *week*. Similarly, three-dimensional space is the domain against which *up* and *down* are understood, while the notion of a container is the domain for the understanding of *in* and *out*. In principle, any conceptualization or knowledge configuration, no matter how simple or complex, can serve as the domain for the characterization of meanings. Thus, to give an example of a more complex domain, the set of rules which make up the game of cricket constitutes the domain for an understanding of what 'an over' is; knowledge of how an internal combustion engine works is the domain for understanding the concept 'carburettor', while phonological theory is the domain for understanding such concepts as phoneme and allophone. Neither should we restrict ourselves, in this discussion, to the meanings of lexical items. Morphological and syntactic categories also need to be understood against the relevant domain. For instance, the diminutive (in its basic sense) presupposes the domain of physical size, the domain for the understanding of the past tense (in its past-time reference) is time, the domain for the understanding of a transitive clause (e.g. *The farmer shot the rabbit*) concerns the energetic interaction of entities in a single event.

A linguistic form gets its meaning by **profiling**, or highlighting, a particular region or configuration in the relevant domain. Profiling entails the structuring of a domain by means of an appropriate **image schema**.[2] The concepts week, day, and Monday emerge when a bounding schema profiles bounded regions in the domain of time; a sequencing schema structures the concept 'week' into a succession of discrete bounded entities; and a further schema profiles the first of these successive units. *Up* and *down* impose an orientational schema on the domain of vertical space; *in* and *out* get their meanings through a containment, or, respectively, an exclusion schema; *wing* profiles a particular region of its domain by means of the part–whole schema; and so on.

Time and three-dimensional space, in the above examples, constitute what Langacker (1987: 148) calls **basic domains**, i.e. the concepts of time and space are not reducible to other, more primitive cognitive structures. Other basic domains include sensory experiences like temperature, colour, taste, and

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[2] For the concept of image schema, see Ch. 7. The term is due to Johnson (1987); see also Lakoff (1987*b*). 'Image schemas', as used here, are not to be confused with Langacker's use of 'schema' to refer to the abstract representation of what is common to the members of a category.

pitch, and perhaps certain psychological states like pleasure and sadness. Other domains, such as the game of cricket, are obviously more complex. Lakoff (1987*b*) has drawn attention to the role of a relatively small number of image schemas in the structuring of domains. In addition to those already mentioned (boundedness, part–whole, containment, orientation), Lakoff mentions the journey schema with its constituent parts of source, path, and goal, and the schemas of linkage and separation, and of proximity and distance. As we shall see in Chapter 7, these and other image schemas are crucially involved in an understanding of processes of metaphorization.

Some of the examples given so far, like *up* and *in*, can be explicated very simply with reference to a single domain. Very often a linguistic form needs to be characterized against a number of different domains simultaneously. These constitute the **domain matrix** for the item in question. *Golf ball* is understood partly in terms of typical shape (i.e. golf balls are spherical entities in three-dimensional space), as well as colour, size, material, texture, etc. A full understanding of the expression also requires reference to the set of rules and activities which together constitute the game of golf. Similarly *Monday* is not only the first day of the week; a full understanding of the word needs to make reference to the division of the week into periods of leisure (i.e. the weekend) and periods of work, Monday being the first day of the working week after the weekend. Sometimes one of the domains associated with a lexical item might be more salient than others. In this connection, Langacker (1987: 165) distinguishes between primary and secondary domains. *Salt*, in its everyday sense (i.e. "table salt"), is primarily associated with the domain of food: salt is a substance added to certain kinds of food in order to enhance their flavour; only secondarily is its chemical composition at issue. *Sodium chloride*, an expression with the same reference as *salt*, is understood against the domain of chemical composition, and only secondarily in terms of its role as a food additive. Other near synonyms can sometimes be distinguished with respect to the different domains against which they are understood. *On land* and *on the ground* could describe exactly the same location; *on land*, however, evokes the domain of a sea voyage, while *on the ground* evokes the domain of a flight through the air (cf. Fillmore 1979*b*: 97).

A rather more complex example of a lexical item being characterized against several domains simultaneously has been provided by Lakoff in his discussion of the word *mother* (Lakoff 1987*b*: 74 ff.). (Lakoff, however, does not use the term 'domain'.) Lakoff points out that we need to take into consideration at least five domains (in addition to those which characterize *mother* as a human female) for any adequate understanding of the word. These are:

(a) the genetic domain. A mother is a female who contributes genetic material to a child;

(b) the birth domain. A mother is a female who gives birth to the child;

(c) the nurturance domain. A mother is a female adult who nurtures and raises a child;

(d) the genealogical domain. A mother is the closest female ancestor;

(e) the marital domain. The mother is the wife of the father.

We can compare the domains against which *mother* is understood with the domains necessary for a full understanding of *father*. Again, five domains seem to be implicated:

(a) the genetic domain. A father is a male who contributes genetic material to a child;

(b) the responsibility domain. The father is financially responsible for the well-being of the mother and the child;

(c) the authority domain. The father is a figure of authority responsible for the discipline of the child;

(d) the genealogical domain. The father is the closest male ancestor;

(e) the marital domain. The father is the husband of the mother.

It is clear from this account that the meaning of *father* is not, as the componentialists and structuralists would maintain, identical to *mother*, but for the feature [MALE] rather than [FEMALE]. Only with respect to the genetic, genealogical, and marital domains are the two concepts at all comparable. Later in this chapter, we shall see how different uses of the words *mother* and *father* may involve the foregrounding, or 'perspectivization' of certain domains in the domain matrix, and the backgrounding of others.

## 5.3 Frames and scripts

The notion of a domain—especially in cases where the domain is cognitively quite complex, or where a linguistic form needs to be characterized against several domains simultaneously—overlaps to a large extent with what others have referred to variously as frames, scripts, schemata, scenes, scenarios, and idealized cognitive models; Putnam's stereotypes also appear to coincide with our notion of a prototype seen in the context of the relevant domain matrix. The terminology in this area is confusing, partly because different terms may be used by different authors to refer to what seems to be the same construct, or the same term may be used to refer to different constructs. Furthermore, it is not at all clear that it is possible to make clean conceptual distinctions in this area. Nevertheless, I have found the term 'frame' to be a useful theoretical term, denoting the knowledge network linking the multiple domains associated with a given linguistic form. We can reserve the term 'script' for the

temporal sequencing and causal relations which link events and states within certain action frames.

Frames and scripts are constructs which were originally developed by researchers in the field of artificial intelligence. The constructs made it possible to represent in computer memory those aspects of world knowledge which appear to be involved in the natural processing of texts. The constructs have also proved invaluable in studies of natural comprehension. According to de Beaugrande and Dressler (1981: 90), **frames** constitute 'global patterns' of 'common sense knowledge about some central concept', such that the lexical item denoting the concept typically evokes the whole frame. In essence, frames are static configurations of knowledge. **Scripts**, on the other hand, are more dynamic in nature. Typically, scripts are associated with what we have referred to earlier as basic level events such as 'do the washing up' and 'visit the doctor', which are structured according to the expected sequencing of subordinate events (cf. Rosch 1978).

As an illustration of the notion of frame, let us reconsider Lakoff's discussion of *mother*. The five domains against which this word needs to be characterized do not constitute a random set. It is the structured whole that I shall call the 'mother frame'. According to the mother frame, a mother is a woman who has sexual relations with the father, falls pregnant, gives birth, and then for the following decade or so devotes much of her time to nurturing and raising the child, remaining all the while married to the father. In such a situation all five domains converge. Clearly, such a scenario is highly idealized, in that the frame abstracts away from its many untypical instantiations. Unmarried mothers, for whatever reasons, do not have the marriage relationship with the father; in the case of children given for adoption, there is a split between the genetic and birth domains on the one hand and the nurturance domain on the other; surrogate motherhood results in a splitting off of the genetic domain from the birth domain; alternatively the nurturance domain might undergo a split, in that the birth-giving mother remains responsible for nurturance, while the actual job of nurturing is taken over by someone else, e.g. a nanny or a grandparent. It is against the background of the idealized scenario that we characterize a prototypical mother. Adoptive mothers, surrogate mothers, stepmothers, unmarried mothers, widowed mothers, uncaring mothers, even perhaps so-called working mothers, are more marginal members of the category. Ultimately, the frame embodies deeply held beliefs about the status and role of the family in society. To this extent, it is irrelevant to ask whether prototypical mothers are in fact of more frequent occurrence than less prototypical members of the category. Some people might well believe that the idealized scenario does in fact constitute the norm; others might be more sceptical, but might at the same time believe in the desirability, at least, of the idealized scenario, while others vehemently reject it for its sexist assumptions. Neither is the idealized scenario immune to change. Some readers might feel that my account of prototypical motherhood is already outdated.

Clearly, then, frames do not necessarily incorporate scientifically validated knowledge of the world. Take again the example of *Monday*. We would want to include in the frame the knowledge that Monday is the first working day after a culturally institutionalized weekend, that on Mondays people reluctantly return to the routine of work after their weekend leisure, and that it generally takes them a little time to readjust to the work pattern. Again, the knowledge is idealized. It is hardly relevant to housewives, or to people who work at weekends and have Mondays free. Other people might be only too eager to return to work after the boredom of the weekend, while people on vacation have both weekends and Mondays free. And, just as with the *mother* example, the idealization of the frame seems to rest, ultimately, on deeply entrenched cultural beliefs and practices. In this case we have to do with the division (inherited from the Jewish tradition) of our life into alternating periods of work and periods of rest.

For an example of the role of a script in our understanding of linguistic items, we can refer to Kövecses's (1986) study of the way in which we understand the concept of anger. (Kövecses's study is summarized and elaborated in Lakoff 1987*b*.) Anger is not just a matter of being in a certain emotional state. Being angry is understood against a typical series of events. First, there is a provocation, which results in a typical emotional reaction. The emotional reaction creates an internal tension, which needs to be either controlled (one suppresses, or manages, one's anger) or dissipated through retribution (one 'gets even' with the offender). Otherwise, the anger increases in intensity, resulting in an uncontrolled outburst. Various expressions which we use to talk about anger (*The remark provoked me to anger*, *I felt my anger rise*, *I couldn't control my anger*) refer to different episodes in the script. Metaphorical expressions having to do with anger (*My blood began to boil*, *I kept my cool*, *I blew my top*) refer to specific metaphorical elaborations of parts of the anger script.

As mentioned in Section 5.1 above, the mental lexicon, although encyclopaedic in nature, includes but a subset of a person's total knowledge. But where, and on what basis, do we draw the line? Brown and Yule consider that the outstanding problem for frame and script theory is to find 'a *principled* means' for distinguishing between those aspects of world knowledge that are relevant to text processing, and those which are not (1983: 244; authors' emphasis). Wierzbicka (1985) also recognizes the importance of this issue by consistently making a distinction between knowledge *of* a concept and knowledge *about* a concept. The distinction is drawn in terms of whether a particular piece of knowledge associated with a concept shows up in linguistic expressions. Thus Wierzbicka's definition of *elephant* includes the information that elephants are reputed to have long memories, presumably because of the existence of the catch-phrase in English *Elephants never forget*. Other facts about elephants—e.g. that they are a protected species—are not included in her definition. But, it might be objected, does not this distinction, assuming we

agree on the means for drawing it, merely reinstate the old distinction between linguistic and non-linguistic knowledge? Admittedly, the boundary is drawn in a different place, but is it not the same kind of distinction that is being made?

The objection is unjustified, as it presupposes a clear dividing line between linguistically relevant and linguistically irrelevant knowledge. Frames, as I have stressed, are configurations of culture-based, conventionalized knowledge. Most importantly, the knowledge encapsulated in a frame is knowledge which is shared, or which is believed to be shared, by at least some segment of a speech community. In principle, *any* scrap of knowledge, even the most bizarre, can get absorbed into a frame, provided the association is shared by a sufficient number of people. Langacker (1987: 160) notes that Jimmy Carter's presidency had a substantial, albeit transient, effect on the meaning of *peanut*.

## 5.4 Perspectivization

I would like at this point briefly to introduce a further construct which will prove valuable in the following discussion, namely **perspectivization**. (The term is taken from Dirven *et al.* 1982.) It frequently happens that different uses of a word whose semantic structure is rather complex tend to highlight different components of frame-based knowledge. Thus, if I say that my birthday falls this year on a Monday, I am using the word *Monday* to refer simply to a position in the seven-day week. Suppose, on the other hand, that I complain of a 'Monday-morning feeling'. What is at issue here is not primarily the position of Monday in the week, but rather the fact that Monday follows the weekend. What is perspectivized is only one component of the Monday frame, i.e. the reluctance with which one returns to work after the leisure of the weekend. Again, if I remark that my car must have been made on a Monday, I am perspectivizing the shoddy workmanship associated, within the Monday frame, with the reluctant return to the work-place after the weekend. Other examples are provided by some of the mother expressions cited earlier. *Birth mother* perspectivizes the birth domain, while *working mother* invokes the belief associated with the nurturance domain that a mother should devote a major part of her time to caring for her children.

As will be discussed more fully in the next chapter, perspectivization gradually shades into metonymic extension. In many instances, the perspectivization of one component of a frame not only backgrounds other components, the other components are suppressed completely. I can complain of a Monday-morning feeling even if it is not Monday, while the remark *This car was made on a Monday* need not entail any commitment regarding the actual day of the week on which the car was assembled, or even whether it was in fact assembled on a single day. Similarly, when a Zulu uses the word *umana* "mother" as a term of respect to an older female, the genetic,

birth, and other domains are irrelevant to the word's meaning; only certain components of the genealogical domain are in focus.

## 5.5 Frames and scripts in the comprehension of nominals

If, as I have argued, the meanings of all linguistic forms can only be characterized relative to a speaker's background knowledge, it follows that the comprehension of any linguistic expression, even the most banal, requires the activation of appropriate encyclopaedic knowledge. The thesis is well illustrated by the formation and understanding of compound nouns, especially so-called 'root compounds' (Botha 1984: 2) in English.[3] In the early years of generative syntax, it used to be thought that nominal compounds should be derived through transformation from an underlying phrasal structure. Thus, *girlfriend* was derived from 'The friend is a girl', *arrow head* was seen as a transformation of 'The arrow has a head' (Lees 1960). This approach assumed, among other things, a fixed number of underlying syntactic relationships between the elements of nominal compounds, and, associated with these, an equal number of compounding transformations. Since the number of underlying relationships was rather large, it followed that a nominal compound could be multiply ambiguous, i.e. it was derivable from many different underlying phrases. It was then left to the language user's encyclopaedic knowledge to select the pragmatically most reasonable derivation (cf. Katz and Fodor 1963). It is certainly true that nominal compounds may be open to different interpretations. Which interpretation we select is based on encyclopaedic knowledge about the kinds of relations which things are likely to bear to each other. It is on the basis of what we know about the manufacture and use of shoes that *alligator shoes* are taken to be "shoes made from alligator skin", rather than "shoes worn by alligators" (cf. *horse shoes*), "shoes for walking on alligators" (cf. *beach shoes*), or even "shoes for wearing during the alligator time" (cf. *winter shoes*).

Nowadays, no one would take seriously the idea that compounds are derived, by transformation, from underlying phrases. One factor which contributed to the demise of the transformational account was the realization that the number of semantic relationships invoked by nominal compounds is essentially open-ended (Downing 1977*b*). Compounds are created by simply aligning two nouns, the first of which, in some unspecified way, limits the referential possibilities of the second. In principle, practically any kind of relationship between entities can be the basis of a compound, and indeed

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[3] Root compounds may be contrasted with synthetic compounds. A synthetic compound can be transparently related to a verb phrase, and is typically headed by a noun derived from a verb. Thus, a person who loves dogs is a 'dog-lover', a person who write letters is a 'letter-writer'. Here, the initial noun bears a kind of direct object relation to the second. Root compounds (e.g. *apple juice*) simply align two nouns, the first of which does not bear a direct, quasi-syntactic relation to the second.

speakers do create novel compounds when they wish to identify a specific entity within a discourse context. Downing cites the example *apple juice seat*, which was used by a hostess to refer to a place at the table which had been provided with a glass of apple juice. It is unlikely that such an expression could become a standard, or conventionalized expression in the language, since the need to identify a place at a dining table in this way is restricted to the particular circumstances in which the expression was uttered. Other compounds, however, have become conventionalized—*apple juice* is an example— due to the salience in our culture of the kinds of entities denoted by the compounds. As such, the compounds may be listed in dictionaries, along with their fixed, conventionalized meanings. But whether a compound is a nonce formation or is conventionalized, the kind of relation between the elements of a compound must be one which is available through the activation of the appropriate frame-based knowledge. *Apple juice* has become conventionalized, and can mean what it does, because we know that juice can be extracted from certain kinds of fruit, and that the extracted juice plays a part in our culinary culture.

Similar remarks apply to many adjective-noun combinations. The matter was discussed by Lakoff (1977) in connection with expressions like *topless dress*, *topless bar*, *topless district*, *topless judge*. Our understanding of these expressions rests, firstly, on the knowledge that women are required to cover their breasts in public. We know that women who do not do so serve in certain kinds of bars; that such bars are found in restricted areas of a city; and that such practices, being subject to legislation, are liable to be commented on by judges. Accordingly, we construe a topless bar as a bar in which women wearing topless dresses work as waitresses, a topless district as a district in which topless bars are to be found, and a topless judge as a judge who has made pronouncements on the phenomenon of topless bars, districts, etc. By the same token, an expression like *topless chair* is virtually uninterpretable. It could mean "a chair on which women wearing topless dresses sit", but the knowledge encapsulated in our topless frame has no place for such an object. The expression is to all intents and purposes ill formed.

These considerations lead to an important conclusion. On the classical, feature theory of meaning, sequences of words (e.g. adjective-plus-noun combinations) are either grammatical or ungrammatical, depending on the compatibility of their feature specifications; because features are binary, the grammaticality of word combinations is strictly a matter of either-or. It seems, however, that the acceptability (i.e. grammaticality) of an expression is not merely a function of the semantic and syntactic properties of its component parts. Acceptability is also a function of interpretability, given certain background knowledge. To the extent that an expression is interpretable, it will be accepted as well formed; otherwise it will be rejected.

## 5.6 Fake

In this and the following section I would like to explore the above thesis by considering two words whose semantics, and whose combinatorial possibilities, are difficult to account for without reference to frames and scripts. In this section I take the word *fake*.

It is well known that the semantics of *fake* create problems for the classical theory of categorization. The difficulties were noted by Lakoff and Johnson (1980) in connection with sentence (3):

**(3)** This is a fake gun.

The question is whether a fake gun is or is not a gun. In some respects it is, in other respects it isn't. (Recall the Aristotelian law of contradiction!) A fake gun is a gun to the extent that it possesses many of the attributes of a real gun; it looks like one, and performs at least some of the functions of a gun, e.g. it can be used to intimidate people. Yet a fake gun fails to perform a presumably essential function of a gun, i.e. it doesn't shoot. However, a real gun which fails to shoot, e.g. because it is rusty, or simply because it is unloaded, does not for this reason become a fake gun. Neither is a toy gun, which also fails to shoot, a fake gun. A fake gun has to have been constructed so that its appearance is such that it can be used with the intention of deceiving.

Thus only things that have been fabricated can qualify as fakes. Even if *fake* modifies a noun that normally refers to a non-artefact, as in the expression *fake gold*, the noun would be understood as referring to a fabricated substance.[4] The problem is, not all artefacts come in fake versions. It is difficult to imagine what would be meant by *fake bed*, *fake newspaper*, or *fake examination paper*. On the other hand, *fake Louis XIV chair*, *fake first edition*, and *fake Ph.D. certificate* are readily interpretable. In each case an essential attribute of the real thing is missing—the fake chair is not really an antique, the certificate does not really testify to the holder having obtained an academic degree, the book was not really published on the date stated on its title page. Deception in these cases is possible because the fake possesses all (or a very large number) of the perceptual attributes of the genuine article. But there is another important property of fakes. This is that the stakes involved in a successful deception are potentially high. Dealers who can pass off fake antiques as real antiques stand to make a good profit; conversely, if the fakes are discovered, the dealers stand to lose both money and their reputation. On the other hand, not much is to be gained from the construction of, say, a bed

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[4] Some uses of *fake* might appear not to refer to artefacts, e.g. *That man is a fake*. This sentence, however, does not mean that the man, as a biological entity, is a fake, only that his personality, or the identity that he presents to the world, is a deception. Admittedly, a personality is not a prototypical artefact. Yet a person can consciously 'construct' his persona, and do so with the intention of deceiving.

which looks in all respects like a bed but which fails to perform an essential function of a bed (what might this be?). In this respect, *fake* contrasts with *false*. Consider what would be meant by *false teeth* and *fake teeth*. False teeth have been fabricated to look like teeth and to perform most of the functions of teeth, e.g. one can chew with them, yet not much is at stake in passing off false teeth as genuine teeth. On the other hand, in view of the fact that the examination of teeth has played an important role in the study of primate evolution, one can easily imagine unscrupulous palaeontologists presenting fake teeth to the academic world. At stake here are their professional reputations and their careers.

At this point, we might consider how these facts about the combinatorial possibilities of *fake* could be accommodated within a feature-based description. That *fake* can only be applied to a certain range of nouns is an instance of a selectional restriction. We could capture some very general properties of the word by saying that *fake* is restricted to occurring with nouns possessing the feature [+ARTEFACT] (or alternatively, to account for cases like *fake gold*, that *fake* transfers this feature to the noun), and that *fake* is distinguished from *false* in that the former possesses the feature [+DECEPTION], while the latter is marked [−DECEPTION]. There are two, related problems. How can we delimit the range of nouns to which the feature [+ARTEFACT] can be transferred, i.e. why can we have *fake gold* but not, presumably, *\*fake vermin*? And how do we represent the fact that *fake* readily combines with the names of some artefacts (e.g. *gun* and *antique*) but not with others (e.g. *bed* and *newspaper*)?

In contrast with the componentialist view, I would maintain that the possibility of combining with *fake* has nothing to do with any properties of the nouns *gun*, *newspaper*, *tooth*, etc. as such. What is at issue is certain properties of the entities to which these nouns refer. These properties are not inherent to the entities, but rather have to do with the role of the entities in a particular cultural context. More precisely, the appropriate use of *fake* requires the activation of an appropriate frame. To understand the expression *fake antique*, we need to draw on what we know about antiques. We need to know that the age of certain artefacts can in some instances greatly affect their monetary value, that there are people in our society who make their living by buying and selling such artefacts, that some people invest in them, that others collect them, that there are people with professional expertise for estimating their age and value, and so on. This knowledge comes together in what we might call the antique trade frame. It is only in the context of this frame that we can know what is at stake in constructing an artefact so that it looks old. Otherwise, the expression would be simply uninterpretable. Similarly, to understand *fake Ph.D. certificate*, we need to know about the role of academic degrees as a formal qualification for certain kinds of employment, while *fake gun* only makes sense in the context of generally held knowledge about bank robberies and plane-hijackings. If *fake gun* were to activate only a game safari frame, the expression would be virtually uninterpretable, since it would be difficult to

imagine someone intimidating wild animals with a gun which did not shoot. By the same token, *fake bed* is unacceptable simply because we cannot activate a frame in which beds can be associated with any kind of high-stake deception.

## 5.7  Real

*Real*, in one of its senses, is the converse of *fake* and *false*. We can contrast a *fake gun* with a *real gun*, a *real moustache* with a *false moustache*. *Real* can also function as a kind of hedge. Let us illustrate with the word *bachelor*. In Chapter 2 we discussed a componential analysis of *bachelor*. A componential analysis, and the related notion of analytic truth, can neatly account for the semantic anomaly of a sentence like (4):

(4)  *This married man is a bachelor.

Yet, if we hedge the word *bachelor* with *real*, sentences like (4) cease to be anomalous:

(5)  Mary's husband is a real bachelor.

Paradoxically (5) is not only non-anomalous, it is also quite informative. It tells us quite a lot about Mary's husband, e.g. that he is an inveterate womanizer. A *real bachelor*, then, does not have to exhibit each of the four defining features of *bachelor*, as analysed by Katz and Postal. Conversely, in some situations it is inappropriate to use the word *bachelor* of someone who clearly does exhibit each of the defining features. Fillmore (1982: 34) raises the question whether the Pope can be considered a bachelor. The question seems bizarre. The Pope is surely a very marginal instance of the category, if indeed he is a bachelor at all (6). Even worse is a description of the Pope as *a real bachelor* (7):

(6)  ?The Pope is a bachelor.
(7)  ??The Pope is a real bachelor.

Not surprisingly, a description of the Pope as a bachelor becomes much more acceptable if it is hedged with *strictly speaking* (recall that *strictly speaking* removes the fuzziness from a category: s. 4.4):

(8)  Strictly speaking, the Pope is a bachelor

*Strictly speaking*, however, cannot be combined with *real*:

(9)  *Strictly speaking, Mary's husband is a real bachelor.
(10)  *Strictly speaking, the Pope is a real bachelor.

An explanation of these (according to a classical feature theory of concepts) highly bizarre facts is to be found, once again, in terms of world knowledge

systematized in frames. In Chapter 2 I mentioned in passing that the concept of bachelorhood presupposes the cultural institution of marriage. But the background knowledge is much more complex than this. In the first place, what we might call the bachelor frame (as well as, *mutatis mutandis*, the spinster frame) includes the notion of a marriageable age. People who have passed this age are expected to have married; only those who fail to do so are normally referred to as bachelors (or spinsters, as the case may be). People below the marriageable age are not normally categorized in terms of their unmarried status. One consequence is that while one may readily say that a man will cease to be a bachelor on his wedding-day, one does not normally speak of a youth becoming a bachelor on reaching adulthood:

(11)  \*On your eighteenth birthday, you'll become a bachelor.

Like some examples discussed earlier in this chapter, the bachelor frame is highly selective, not to say stereotyped. It certainly does not present a scientifically accurate picture of marriage practices in our society. Most obviously, the frame leaves out of account various minority groups, like celibate priests and nuns, who go through life unmarried. It also ignores homosexuals, and people who have long-term unmarried relationships. These people, like persons below the marriageable age, just do not qualify for bachelor- or spinsterhood; they are not covered by the frame. Hence the oddity of referring to a Catholic priest, just as to an eighteen-year-old school pupil, as a bachelor. We can, however, appropriately refer to these people as bachelors if we hedge our statements with *strictly speaking* or *technically*. *Technically* invokes a bureaucratic definition of bachelorhood, while *strictly speaking*, as we have seen, gives a more central status to marginal members.

There are further ramifications of the frames activated by the words *bachelor* and *spinster*. We have seen that, in terms of the frames, a person who has passed the marriageable age is expected to have married. But some people (we are not considering those groups of people, like priests, nuns, and homosexuals, who are not covered by the frame) do not marry. The frames attribute different motives to men and women who fail to marry. A man who does not marry does so from choice; he decides against the 'commitments' of marriage. A woman who does not marry does so from necessity. Thus *eligible spinster* is almost a contradiction, while *eligible bachelor* is a normal collocation. As Robin Lakoff put it, in her study of sexism in language, the spinster 'has had her chance, and been passed by'; she is 'old unwanted goods' (1975: 32 f.). *Real* activates these dormant, rarely explicated components of frame logic. *Real bachelor* highlights the man's irresponsibility, while *real spinster* focuses on the woman's sexual unattractiveness. The words *bachelor* and *spinster* thus differ in many more ways than just the feature specification [MALE] vs. [FEMALE]. No doubt it is the sexist bias implicit in the spinster frame that accounts for the relatively infrequent use of the word *spinster*, as well as the coinage of the

expression *bachelor girl*. The expression attributes to single adult females the same motives for not marrying as to their male counterparts.[5]

In a sense, *real* and *technically/strictly speaking* have opposite semantic effects. *Technically* and *strictly* dissociate a category from its conventionalized frame. *Real*, on the other hand, highlights attributes conventionally associated with a frame, while at the same time releasing the category from otherwise necessary conditions for membership. A *real man* exhibits to a high degree stereotyped attributes of masculinity; his gender is not at issue. Colloquially, a *real moron* is someone who conforms pretty well with our stereotype of slow-wittedness; his mental age on the Binet test (the technical definition of *moron*) is irrelevant. Significantly, given the classical structure of most expert categories, terms restricted to technical discourse are difficult to hedge with *real*. It would be very odd to speak of a 'real bilabial plosive' (although we shall see in Chapter 11 that one linguist has written of 'copperclad, brass-bottomed Noun Phrases'). It simply goes counter to the very function of a technical term to release it from its criterial definition, and to highlight the associated stereotype.

## Study questions

1. Milk comes in various subcategories. There is fat-free milk, vitamin-enriched milk, butter milk, condensed milk, ultra-heat-treated milk, goat's milk, etc. Suppose you wish to buy some milk which is none of these special categories. How would you refer to it?

2. In what circumstances would you refer to the colour of an object as 'plain red', 'an ordinary red', and 'real red'? Do these expressions designate different colours? Consider the use of the hedges *plain*, *ordinary*, and *real* in association with other nouns, such as *food*, *dog*, *lover*, *house*, *job*. How are the combinations interpreted?

3. Lack. One might suppose that *lack* means, quite simply, 'not to have'. Thus, if a person does not have the appropriate background knowledge to investigate an issue, one might say that he 'lacks' the appropriate background knowledge. On the other hand, it would be odd for an unmarried man, who does not have a wife, to say that he 'lacks' a wife, and for a childless couple, who do not have any children, to say that they 'lack a child'. Under what circumstances can one say that an entity *x* lacks a component/property/possession *y*? (On the semantics of *lack*, see Tsohatzidis 1995.)

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[5] It hardly needs pointing out that on Katz and Postal's componential analysis, *bachelor girl* is doubly contradictory: *girl*, being [FEMALE] and [−ADULT], contradicts *bachelor*, which is [MALE] and [+ADULT]. The fact that *girl*, to a greater extent than *boy*, can be used of adults, can also be explained in terms of stereotyped sex-role frames.

4. Old. Consider the different ways in which *old* modifies the meanings of nouns with which it combines in the expressions *old man*, *old friend*, *old student (of mine)*, and *the old regime*. Given that I can refer to a former student of mine as one of my 'old students', why would it be odd for a woman to refer to her former husband as her 'old husband'? (On the semantics of *old*, see Taylor 1992*b*.)

5. One argument for the incorporation of encyclopaedic knowledge into the meanings of words, is that some of the conventionalized uses of a word make reference to encyclopaedic knowledge. Consider the semantics of the underlined words in the following from this point of view:

   a <u>banana</u> republic
   a <u>window</u> of opportunity
   work like a <u>horse</u>
   a <u>cat</u>-fight
   he <u>rabbit</u>ed on about it
   he was <u>dogg</u>ed by the past
   a veritable book<u>worm</u>
   a computer <u>mouse</u>

6. Bachelors and spinsters. Collect some examples of how the words *bachelor* and *spinster* are used. For this purpose, you might make use of some readily available electronic corpora, such as the British National Corpus, accessible at *http://thetis.bl.uk/lookup.html*. Consider the use of the two words with an eye on the idealized models of marriage practices which the words presuppose.

# Further reading

For domains, see Langacker (1987: ch. 4) and Croft (1993).

On conceptual combination, see Hampton (1991). On compounds and their interpretation, see Downing (1977*b*) and Ryder (1994).

There are some interesting remarks on *real* in Austin (1962: ch. 7).

For an entertaining account of attempts by 19th century scientists to classify the platypus (an egg-laying mammal), and for the implications of the story for theories of the dictionary vs. encyclopaedia, see Eco (2000).

# CHAPTER 6

# Polysemy and Meaning Chains

The discussion so far in this book has been restricted to what we might call monocentric categories, where membership in the category is a function of similarity to a single prototype representation. This chapter extends the prototype model, so as to render it applicable to a wider range of linguistic data. Many natural language categories, perhaps even the majority, exhibit a polycentric structure, i.e. category membership is a function of similarity to one of several prototype representations. The multiple prototypes associated with the category are themselves related in what I shall call, adapting Wittgenstein's metaphor, a family resemblance structure. Family resemblance categories will be illustrated on the examples of the lexical items *climb* (briefly discussed in Fillmore 1982) and *over* (the topic of Brugman's 1981 thesis). To conclude the chapter, some theoretical problems associated with the family resemblance model are addressed.

## 6.1 Monosemous and polysemous categories

The distinction between monocentric and polycentric (or family resemblance) categories corresponds to the traditional distinction between **monosemy** and **polysemy**. A monosemous lexical item has a single sense, while polysemy is the

association of two or more related senses with a single linguistic form.[1] Intuitively, the distinction is clear enough. The word *bird* can refer to many different kinds of creature—robins, penguins, ostriches, and so on. These different kinds of creature are members of the category in virtue of similarity to a single prototype representation. We would not, in this case, want to say that *bird* has more than one meaning. Compare *bird* and *school*. We can use the word *school* to refer to the place where children are educated, to the administrative division of a university (as in *School of Medicine*), to an intellectual trend (*school of thought*), or even to a group of whales. In this case we would want to recognize a number of distinct, though related, meanings of the word.

The distinction between monosemy and polysemy plays a crucial role in the study of word meaning. For this reason, we need to give more substance to the intuitive characterization of the distinction that was given above. Of some help in this respect is our earlier account of meaning in terms of the profiling of some entity within a given domain (Section 5.2). If different uses of a word require, for their characterization, reference to two different domains or two different sets of domains, this could be a strong indication that the lexical item in question is polysemous. *School*, which can be understood against a number of alternative domains (the education of children, the administrative structure of a university, etc.), is a case in point. Another clear example is provided by the word *pig*. Some uses of the word have to do with the classification of animals; alternatively the word is understood in terms of the eating habits of humans. However, an item may still be polysemous even if its different meanings need to be characterized against the same domain. In such cases one and the same domain may be structured by means of alternative image schemas. Compare the two senses of *high* in *high ceiling* and *high building*. In both expressions, *high* needs to be characterized against the domain of vertical space. In *high ceiling*, however, *high* profiles the position of an entity in vertical space, while in *high building* it is the vertical extent of an entity that is being profiled. Here, we would want to say that the two expressions exemplify two different—though obviously closely related—senses of *high*.

Even though the distinction between monosemy and polysemy is in principle clear enough, it is in many cases tantalizingly difficult to decide if two uses of a linguistic form instantiate two different senses or whether they represent two exemplars, one perhaps more central than the other, of a single sense. Consider some uses of the word *mother*, discussed in the preceding chapter. An adopted child could use the word to refer either to her adoptive, nurturing mother, or to her natural, birth-giving mother. Do these uses represent two different senses? On the one hand, the two uses do indeed perspectivize different domains. On the other hand, it could be argued that the

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[1]  Here, as elsewhere in this book, I am using the term 'sense' as a stylistic variant of 'meaning'. No theoretical significance, therefore, is to be attached to the use of the one term rather than the other.

perspectivized domains are still understood against the context of the whole matrix of domains characterizing the prototypical mother. Adoptive mothers and birth-giving mothers are merely different kinds of mother.

To deal with the not-so-clear cases, semanticists over the years have proposed a variety of **tests** for diagnosing polysemy. The tests rest on the fact that the polysemy or monosemy of a lexical item can affect the interpretation of a sentence in different ways. In (1), the word *pig* is polysemous, and gives rise to an ambiguity; either the word refers to a certain kind of animal, or it refers to a person with gluttonous eating habits:

(**1**)  There's a pig in the house.

We may suppose that anyone who utters (1) has one of the two senses in mind, to the exclusion of the other. Likewise, to understand the sentence requires that the hearer selects one of these senses and rejects the other. Monosemous items, on the other hand, merely give rise to vagueness, or indeterminacy, rather than ambiguity. In (2), *bird* is vague; any member of the category could be meant, including its more marginal members.

(**2**)  There's a bird in the garden.

While one could, in principle, question the speaker of (2) as to what kind of bird she was talking about, an understanding of the sentence does not require such specification, nor does the utterance of (2) presuppose that the speaker is interested in, or even capable of, undertaking such a specification.

The distinction between monosemy and polysemy thus resolves into a question of distinguishing **vagueness** from **ambiguity**. *Bird* in (2) is vague with respect to which kind of bird is meant; *pig* in (1) is ambiguous, in that one or the other sense has to be intended. Three tests for diagnosing ambiguity vs. vagueness will be mentioned here.

(i)  An ambiguous sentence has more than one reading. It is thus possible, in principle, to assert one of the readings while denying the others. Thus one can assert that there is a pig (i.e. a gluttonous person) in the house, while denying the presence of a pig (i.e. a farm animal) in the house. One could not, however, say that there is a bird (i.e. a robin) on the lawn and at the same time deny that there is a bird (i.e. a starling) on the lawn.

(ii)  A second test concerns the possibility of coordinating the putatively distinct senses of a word in a single construction. If the senses are distinct, the resulting sentence exhibits the kind of oddity, popular with punsters, which traditional rhetoric called **zeugma**.[2] Cruse (1986: 13) gives the following example:

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[2] Zeugma is a figure of speech whereby two distinct senses of a word are incongruously 'yoked' together in a single construction. *He left in a rage and a taxi-cab* is odd because it coordinates two distinct uses of *in*.

(**3**)  Arthur and his driving licence expired last Thursday.

The oddity of this sentence suggests that *expire* has two distinct senses. Note that the oddity can be lessened by 'unyoking' the two senses:

(**4**)  Arthur expired last Thursday; his driving licence also expired.

   (iii)  A third, closely related test exploits the fact that an anaphoric expression like *do so too* requires for its interpretation the same sense as its antecedent. To the extent that an anaphoric expression and its antecedent can refer to different states of affairs, we are dealing with a case of vagueness; if crossed interpretation is impossible, we have an instance of ambiguity. Sentence (5) would be appropriate if I had seen a robin and Jane had seen a starling; *bird* is therefore vague.

(**5**)  I saw a bird in the garden, and so did Jane.
(**6**)  I don't want a pig in the house, and neither does Jane.

Punning aside, (6) could not mean that I did not want a farm animal in the house and that Jane did not want a gluttonous person in the house; *pig* is therefore ambiguous.
   Unfortunately, the results from ambiguity tests are frequently far from unambiguous themselves. The test sentences need to be constructed with great care. For some putatively ambiguous linguistic forms, suitably coordinated sentences are difficult to devise; also, factors other than the monosemy–polysemy of a lexical item (such as definiteness of reference, quantification, or pragmatic oddity) can all too easily interfere with the results. Perhaps the major methodological drawback is that in the last analysis the tests rely, for their success, on the sometimes very fine intuitive judgements which they were designed to replace. I suggested earlier that *high*, as a spatial term, has two distinct senses. It does indeed seem possible to assert that a window is high (i.e. far from the ground) while denying that it is high (i.e. of greater than average vertical extent). But it needs a sophisticated (and cooperative!) informant to detect the zeugma in the sentences in (7):

(**7**)  a.  Both the ceiling and the bookcase are high.
       b.  The ceiling is high; so is the bookcase.

   While it is possible, then, to identify clear instances of monosemy and clear instances of polysemy, the not-so-clear cases suggest that the boundary between monosemy and polysemy is fuzzy—a point I shall develop in Chapter 8. In fact, we may need to approach the monosemy–polysemy distinction in the same manner as we approach the distinction between non-linguistic entities like cups and bowls. Cruse, for one, has suggested that separateness of different senses of a lexical item might be more a matter of points on a continuum than of a dichotomy (1986: 71). This kind of approach would also make sense on a diachronic perspective. Suppose, in the course of time, that a

non-central member of a monosemous category increases in salience to the point where it constitutes a secondary conceptual centre of the category. (Developments of this nature have been traced by Geeraerts 1985*a*.) Such a process will, inevitably, be gradual. Before the full establishment of the secondary prototype within the category, there will be uncertainty as to whether the category is no longer monosemous, or not yet polysemous.

So far we have been concerned with the distinction between monosemy and polysemy. A second distinction that is often made is between polysemy and **homonymy**. The different meanings of a polysemous lexical item are felt to be related in some non-trivial way. Homonymy is when unrelated meanings attach to the same phonological form. There are in principle two ways in which homonymy can come about. Firstly, related meanings of a once poly-semous word have drifted so far apart that there is no perceived relationship between them. This is the case with the two meanings of *pupil*: "scholar" and "iris of the eye". The word, in both its senses, derives from Latin *pupillus/ pupilla*, a diminutive of *pupus* "child". (The pupil of the eye was so called because of the tiny reflection of a human being that can be observed in a person's eye.) Alternatively, unrelated words which were once phonologically distinct have been subject to the 'blind' operation of sound change, and in the course of time have become phonologically identical. An example is the word *die*. The verb ("to expire") derives from Old English *dīegan*, while the noun ("the cube thrown in games of chance") comes from Old French *dé*.

As with the distinction between monosemy and polysemy, the dividing line between polysemy and homonymy is not always easy to draw. We can readily cite clear cases of polysemy (the *neck* of the human body and the *neck* of a bottle) and clear cases of homonymy (*die*). Not-so-clear cases are also numerous. Are the two meanings of *eye* ("organ of sight" and "aperture in a needle") and the two meanings of *ear* ("organ of hearing" and "grain-holding part of a cereal plant") instances of polysemy or homonymy? In fact, the two meanings of *ear* result from the merging of two distinct words in Old English, while the two meanings of *eye* are related through metaphorical extension. The problem, of course, is that relatedness of meaning is both a gradient and a subjective notion. Perhaps some speakers do perceive a tenuous relation between the two meanings of *ear*, while others fail to notice any relation between the two meanings of *eye*. Yet it is doubtful whether speakers' intuitions in this respect correlate with any observable differences in language use (Lyons 1977: 552). If such is the case, it may be questioned whether in the last analysis the distinction between polysemy and homonymy is of any theoretical significance. Consistent with this view is the fact that although tests have been proposed for distinguishing vagueness and ambiguity, no one, to my knowledge, has thought of proposing tests for diagnosing homonymy as opposed to polysemy. Even so, I would suggest that the distinction is of importance. Some evidence comes from cross-language comparisons. Homonymy is in a very real sense an accidental phenomenon, and is thus

language specific. It would be pure coincidence if a phonological form in another language happened to share the two meanings of English *die*, and we would certainly not expect the phenomenon to recur in language after language. The attestation of similar senses in different and, especially, in historically unrelated languages, thus virtually rules out the possibility of chance homonymy, and strongly points to the presence of motivated, polysemous categories.

The distinction between polysemy and homonymy is complicated by a factor which up to now I have left out of account, namely the syntactic behaviour of the linguistic form in question. The feeling that *die* is homonymous is strengthened by the fact that the two senses are associated with two different syntactic categories; in one sense the word is a noun, in the other sense it is a verb. Should we then stipulate that polysemy requires constancy of grammatical function over the different senses? On the face of it, this seems a reasonable approach; if different senses are associated with different parts of speech, we are dealing prima facie with different words. Certainly, the diagnostic tests for ambiguity reviewed earlier presuppose that the various senses of a putatively polysemous word are associated with a single grammatical category. Accordingly, we should not regard the two senses of *drink*— the one associated with the noun, the other with the verb—as an instance of polysemy. The senses are obviously very closely related, but syntactically we are dealing with two different words. But how different, syntactically, do two instances of a linguistic form have to be in order for polysemy to be excluded? Are transitive and intransitive uses of the verb *drink* (as in *He drank a glass of milk* and *He used to drink*) instances of two syntactically different lexical items? With respect to *The boss is in* and *The boss is in the office*, are we dealing with a single lexical item *in*, or with two?

As already mentioned, it is possible to argue that the distinction between polysemy and homonymy is of no theoretical significance. It is not surprising, therefore, that some linguists have attempted to conflate the two phenomena. One approach (cf. Lyons 1977: 553) is to maximize homonymy at the expense of polysemy. This is the line taken by Kempson (1977). Kempson envisages a 'constant semantic value' (1977: 82) for each lexical item in a language. If a phonological form has more than one identifiable sense, then each sense, irrespective of its relation to the other senses, is characterized separately. A treatment of polysemy as if it were homonymy avoids the demarcation problem that we have been discussing. But the approach is open to serious criticism. To give the different senses of a polysemous word the same status as the different senses of a homonym, is rather like treating the regular plurals of English in the same manner as the irregular ones. Polysemy is thereby reduced to an arbitrary, unmotivated phenomenon, and the study of recurring patterns of category structure, both within a given language and across different languages, is rendered theoretically and descriptively inaccessible. In contrast, cognitive linguists have perhaps tended to err in the opposite direction,

maximizing polysemy at the expense of homonymy, even, as we shall see, relaxing the requirement that the senses of a polysemous item are associated with a single syntactic category.

## 6.2 An illustration: *Climb*

The **family resemblance approach** to polysemy contrasts strikingly with what we might call the **core meaning approach**. A typical statement of the core meaning approach may be found in Allerton (1979: 51). For Allerton, one criterion for the recognition of polysemy as opposed to homonymy is the presence of a shared meaning core. Thus the three 'main meanings' of *a paper*, i.e. "newspaper", "document", and "academic lecture", all share the core meaning "important written or printed material for public use". It is in virtue of this core meaning that the three senses of *a paper* are to be associated with a single lexical item. Cases where a core meaning cannot be extracted—examples mentioned by Allerton include *race* (in the senses "ethnic group" and "speed competition") and *look* (as in *John looked at the professor* and *John looked after the professor*)—must be classified as instances of homonymy.[3]

The requirement that all senses of a polysemous item share a core meaning clearly stems from the classical definition of a category in terms of a set of necessary and sufficient conditions for membership. But just as the range of things that can be designated as cups do not share a set of cup-defining properties, so the related senses of a polysemous item do not have to share an invariant meaning core. This is not to say that the different senses of a polysemous item *never* share a set of common attributes, nor that an abstract overarching schema (in Langacker's sense) can never be extracted. But to make the presence of a common semantic component a defining feature of polysemy is unduly restrictive. In cases where a common semantic core cannot be postulated, one is forced to regard the recalcitrant meanings as instances of chance homonymy. This defeats any attempt to offer a motivated account of category structure.

In this section, I will look at a fairly typical example of a polysemous lexical item, elaborating on Fillmore's remarks on the word *climb* (Fillmore 1982). We will individuate a number of discrete senses of the word, and explicate the relations which hold between them. In the course of the discussion the impossibility of subsuming the various senses under a more general core sense will hopefully become apparent.

One of the meanings of *climb* is exemplified in (8):

**(8)** The boy climbed the tree.

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[3] Strictly speaking, disjunctive glosses, like Allerton's 'important printed *or* written material', already point to the absence of an invariant meaning core.

Here, *climb* designates a rather complex process, involving motion from a lower to a higher level, along a path defined by a vertical entity (the tree), by means of a fairly laborious manipulation of the limbs. The process can be readily predicated of human beings, as well as of four-legged animals. Following Fillmore we may characterize the process in terms of the attributes [ascend] and [clamber]. It is significant that when asked to give a sentence illustrating the meaning of the verb *climb*, native speakers invariably come up with examples like (8), which strongly suggests that we are here dealing with the central sense of the word.

Now consider sentence (9):

**(9)**  The locomotive climbed the mountainside.

Locomotives cannot clamber. The upward ascent of the locomotive proceeds, not through the manipulation of limbs, but with the turning of wheels. Yet there are similarities between the ascending motion profiled in (8) and (9). The motion in each case is self-propelled; the wheels of the locomotive establish contact with the mountainside, just as the limbs of the climbing boy establish contact with the tree; the motion in both cases is fairly slow, and proceeds with difficulty. Other self-propelled wheeled vehicles, like automobiles, can climb in this sense. In the next sentence, however, virtually nothing is left of the original notion of clambering. *Climb* merely profiles the powerful upward motion of the plane with respect to the vertical dimension.

**(10)**  The plane climbed to 30,000 feet.

We note, however, that not everything which ascends can be said to climb. Planes climb into the sky, as do perhaps eagles soaring upwards. But sparrows and balls thrown into the air do not climb, neither does steam issuing from a kettle, in contrast with, perhaps, smoke rising from a chimney. It is also questionable whether one can speak of an elevator climbing from one floor to another.

The notion of ascending is prominent in other uses of the verb:

**(11)**  a.  The temperature climbed into the 90s.
      b.  Prices are climbing day by day.

Here, [ascend] is optionally combined (perhaps) with the idea of gradualness, which in turn has a tenuous relation to the notion of laboriousness present in [clamber]. But whereas in examples (8)–(10) ascending takes place within the spatial dimension, in (11) ascending is on a numerical value scale. These uses of *climb* are made possible by a process of metaphorization. The sentences in (11) share a common attribute with (8)–(10); what has changed is the domain in which the attribute applies. Extension to further domains is also possible, e.g. the domain of social organization, as in the expression *social climber*.

On the evidence of the examples cited so far, it does look as if it might be possible to extract a common core from the different meanings of *climb*,

namely [ascend]. Even so, the schematic nature of this attribute scarcely does justice to the complexity and subtlety of the individual senses; moreover, appeal to the core meaning does not provide an adequate basis for distinguishing *climb* from other verbs which also profile the upward movement of an entity, such as *ascend*, *rise*, *go up*, etc. More serious for the core meaning account, however, is the fact that not all uses of *climb* have to do with ascending. Consider the sentences in (12). *Climb*, as used in here, is related to the use in sentence (8). The verb perspectivizes only the notion of clambering, with prepositional phrases specifying the path followed by the subject of the verb:

(12) a.  The boy climbed down the tree and over the wall.
     b.  We climbed along the cliff edge.

Predictably, the clambering sense of *climb* is not applicable to entities without limbs:

(13) a.  *The plane climbed (down) from 30,000 to 20,000 feet.
     b.  *The locomotive climbed over the mountain.
     c.  *The snail climbed along the top of the wall.

Many activities which involve a laborious use of one's limbs can be described as climbing. As well as climbing down a tree, one can also climb into a car, under a table, and out of a sleeping-bag. One can even climb into and out of certain articles of clothing, particularly if the article of clothing completely encloses a part of the body and getting into and out of it involves considerable inconvenience. Examples might be a boiler suit or track-suit pants. One cannot, however, climb into a shirt or jacket, although one might—as a very marginal instance—climb into a pair of boots (though hardly into a pair of shoes).

   From these examples, CLIMB emerges as a polysemous category consisting of several relatively discrete senses. The different senses cannot be unified on the basis of a common semantic denominator. Rather, the different meanings are related through **meaning chains**. Schematically: Meaning *A* is related to meaning *B* in virtue of some shared attribute(s), or other kind of similarity. Meaning *B* in turn becomes the source for a further extension to meaning *C*, which is likewise chained to meanings *D* and *E*, and so on. The process may be illustrated as follows:

(14) $A \rightarrow B \rightarrow C \rightarrow D$ etc.

Within the category, meaning relations exist, in the first instance, between adjacent members, while members which are not adjacent might well have very little in common with each other. Given only the two sentences in (15), one might well conclude, erroneously, that *climb* is homonymous, rather than polysemous.

(**15**)  a.  Prices are climbing day by day.
    b.  John climbed out of his clothes.

Yet the meanings *are* related, but only in virtue of intervening links. Adapting Wittgenstein's metaphor, I shall refer to categories with this kind of structure as **family resemblance categories**.[4] In principle, any node in a meaning chain can be the source of any number of meaning extensions. Consequently, as we shall see in the next section, family resemblance categories can sometimes exhibit immense structural complexity.

According to the classical theory of categories, all uses of a word should be unified through their sharing of a common meaning core. Wittgenstein, in his famous remarks on the range of things that count as 'games', showed that this prediction of the classical theory is false. A number of other scholars have made observations to the same effect. Lakoff (1987*b*: 17 ff.) cites the philosopher, John Austin, who, in his 1940 paper 'The meaning of a word' (Austin 1961: 55–75), pointed out that *healthy body*, *healthy complexion*, and *healthy exercise* do not share a common feature. A healthy body *is* healthy, healthy exercise *promotes* a state of health, while a healthy complexion *results from* a state of health. The idea that the different senses of a polysemous item are linked through chaining relationships was also anticipated by John Stewart Mill, in his discussion of the logic of folk categories:

[T]he established grouping of objects under a common name, even when founded only on a gross and general resemblance, is evidence, in the first place, that the resemblance is obvious, and therefore considerable; and, in the next place, that it is a resemblance which has struck great numbers of persons during a series of years and ages. Even when a name, by successive extensions, has come to be applied to things among which there does not exist this gross resemblance common to them all, still at every step in its progress we shall find such a resemblance. ('Of definition', in *System of Logic* (1843), quoted from Hayden and Alworth 1965: 126)

Meanwhile, the anthropologist Rodney Needham (1975: 350) pointed to a 'remarkable parallel' between Wittgenstein's notion of family resemblance and Vygotsky's 'chain complexes', in which the attribute defining the use of a word 'keeps changing from one link to the next', with 'no consistency in the type of bonds' between the links, and hence with no overarching attribute defining the whole class (a characterization which captures pretty well the relationships between the different senses of English *climb*):

Thus by an intriguing convergence of psychological and philosophical analyses, reported independently in Russia and England respectively in 1934, the traditional common-feature definition of a class was demonstrated to be both empirically and formally defective. (Needham 1975: 350)

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[4] Wittgenstein used the metaphor of a family resemblance to refer to the internal structure of a monosemous category (see s. 3.1). What I am here calling a family resemblance category corresponds to Lakoff's (1987*b*) 'radial category'.

As a matter of fact, Vygotsky (1962: ch. 5) identified, in addition to chain complexes, 'associative complexes' (p. 62) and 'diffuse complexes' (p. 65). He discussed (pp. 61–6) these various kinds of 'thinking in complexes' (p. 61), which all involve relations between individual instances, rather than over-arching commonalities, as a developmental stage between 'unorganized con-geries' of objects and the attainment of abstract, generalizing concepts. For Vygotsky, then, 'mature' concepts can indeed be defined in terms of common features. Vygotsky does, however, state that 'remains' of categorization by complexes persist in adult language (p. 61). He cites (p. 73) the example of the diachronic development of the Russian word *sutki*, from "seam joining two pieces of cloth", through "junction (e.g. of two walls)", to "corner", and metaphorically, to "twilight", then, by metonymy, to the present meaning of "24-hour day, measured from one twilight to the next".

## **6.3** Over

Amongst the most polysemous words in English, and in other languages which have them, are the prepositions. As any foreign learner of English will confirm, the polysemy of prepositions verges on the chaotic. This impression is strengthened by the fact that the range of uses associated with any one preposition in one language rarely overlaps with the meanings of any single linguistic form in another language. In English you put gloves *on* your hands and a ring *on* your finger; in Italian gloves go *sulle mani*, but a ring goes *al dito*. In German, you go *auf Urlaub*, you live *auf dem Lande*, and you meet people *auf einer Party*, while in English you go *on* holiday, you live *in* the country, and you meet people *at* a party. Confronted with facts like these, language teachers and writers of textbooks and pedagogical grammars have generally despaired of giving a reasoned account of prepositions. Prepositional usage is idiomatic, and 'just has to be learnt'. Prepositional polysemy, in other words, is reduced to homonymy. Mainstream linguistics seems to have taken a similar line. To the extent that structuralist and generative linguists have had anything at all to say about prepositions,[5] attention has been largely restricted to a small range of central senses. The staggering complexity of prepositional polysemy, not being subject to obvious rule, has been ignored.

In contrast, cognitive linguists have taken up the challenge of the alleged arbitrariness of prepositional usage. In fact, the demonstration that prep-ositional usage is highly structured has probably been one of the major achievements of the cognitive paradigm. Amongst the outstanding early contributions that should be mentioned are the dissertations by Brugman

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[5] In 1973, Jackendoff was able to write: 'people seem never to have taken prepositions seriously' (Jackendoff 1973: 345).

(1981), Vandeloise (1984), and Hawkins (1984), as well as shorter treatments by Dirven (1981), Radden (1985), and Hawkins (1988). Important also is Lindner's (1981) account of the verb particles *in* and *out*. In the following, I will illustrate the approach on what is perhaps the most polysemous of the English prepositions, *over*. The account draws heavily on Brugman's (1981) monograph, and on Lakoff's (1987*b*) re-presentation of Brugman's data.

The discussion, which does not pretend to be exhaustive, will be limited mainly to the spatial meanings of the preposition. First, it is appropriate to make a few remarks about prepositions in general. Prepositions, in their spatial sense, serve to spatially locate one entity with reference to another. Following terminology introduced by Langacker (1987: 231 ff.), the entity which is located will be referred to as the **trajector**, or TR, while the entity which serves as a reference point will be referred to as the **landmark**, or LM. Prepositions may profile different aspects of the TR–LM relationship. An important distinction is between a static and a dynamic relationship. If the relationship is a static one, the preposition denotes the **place** of the TR. Alternatively, the relationship may be a dynamic one of **goal** (the end-point of the TR's movement is profiled), **source** (the starting-point of the TR's movement is profiled), or **path** (some or all of the trajectory followed by the TR is profiled). Other aspects that may be relevant are the shape, size, and dimensionality of the LM and the TR; the presence or absence of contact between the TR and the LM; the distance between the TR and the LM; the orientation (e.g. superior/inferior, inclusion/exclusion) of the TR with respect to the LM; and so on. Even on their spatial senses, prepositions may also be associated with various kinds of 'functional' relations, such as support (as with *on*), containment (*in*), and accompaniment (*with*).

With these general characteristics of prepositions in mind, let us examine the following sentences with *over*:

(16)  a.  The lamp hangs over the table.
      b.  The plane flew over the city.
      c.  He walked over the street.
      d.  He walked over the hill.
      e.  He jumped over the wall.
      f.  He turned over the page.
      g.  He turned over the stone.
      h.  He fell over a stone.
      i.  He pushed her over the balcony.
      j.  The water flowed over the rim of the bathtub.
      k.  He lives over the hill.
      l.  Come over here.
      m. Pull the lamp down over the table.
      n.  He walked all over the city.
      o.  The child threw his toys (all) over the floor.

> p. He laid the tablecloth over the table.
> q. He put his hands over his face.

The great diversity of meanings associated with *over* scarcely needs comment. Some meanings, in fact, such as (a), (g), and (l), appear to have practically nothing in common with one another. To attempt to extract a common meaning core from all the sentences in (16) would thus be a fruitless undertaking. Our task will be to systematize nevertheless the data in (16)—to show, in fact, that OVER constitutes a complex family of related meanings.

In the first of the above sentences (*The lamp hangs over the table*), *over* denotes a static relationship of place. The TR is located vertical to, but not in contact with the LM. In *The plane flew over the city* (b), the TR is again vertical to, and not in contact with the LM. The relationship, however, has changed from static to dynamic. The expression *over the city* denotes (part of) the path followed by the TR. *He walked over the street* (c) is similar, except that now there is contact between the TR and the LM. *He walked over the hill* (d) is closely related to (c), that is, the TR traces a path vertical to, and in contact with, the LM. A new element, however, has been introduced, namely the shape of the path. In walking over a hill, a person first ascends, reaches the highest point, and then descends. In *He jumped over the wall* (e) this curved, arc-like path of the TR is again in evidence. A further element is making its appearance, namely, the notion of the LM as an obstacle that the TR must surmount by first ascending, then descending. The next few examples exploit the idea of a curved path, introduced in (d). In (f), the page moves through 180° as it is turned. (Note that in this and the next few examples, *over* is more of an adverb than a preposition. As suggested earlier, polysemy need not require absolute identity of syntactic function.) In (g), the stone, in being turned over, likewise rotates on its axis. In *He fell over a stone* (h), the subject of the verb traces a more limited arc-like path (say, through 90°), while the unfortunate victim in (i) (*He pushed her over the balcony*) traces a curved, downward path. In (j), water, in flowing over the rim of a bathtub, traces a path of a similar shape.

So far, we have identified a fairly extensive chain originating with (a) and leading, via intermediate links, to (j). Notice in particular how the notion of a curved path, introduced in (d), motivates a set of uses of *over* which at first sight are quite unrelated to the *over* of (a).

It is possible to identify other meaning chains in the sentences in (16). Let us return to (16d). In *He walked over the hill*, *over the hill* denotes the path of the TR, with, as already observed, the LM as a kind of obstacle along the path. A related use is (16k): *He lives over the hill*, where *over the hill* denotes not the path traced by the TR, but the end-point of the path which an observer would have to follow in order to arrive at the TR, while the LM is construed as an obstacle that the traveller would have to surmount. *Come over here* (16l) is an extension of (16k). *Over here* again denotes the end-point of a path, only now

the path is an imaginary one, which originates at the addressee, follows an unspecified trajectory, and finishes in the region of the speaker.

Further uses of *over* denote a covering relationship, as in *He laid the table-cloth over the table* (p). We can relate the use in (p) to (c), via the intermediate uses in (n) and (o). A person who walks *over the street* (c) traces a path in the street. If he walks *all over the city* (n) we can think of the path as being so convoluted that it virtually covers the total area of the LM. Cases like (n) motivate sentences like *The child threw his toys* (*all*) *over the floor* (o), where the notion of covering comes more strongly to the fore. In (p), the covering is complete; the LM has become invisible to an observer. In sentences like (o) and (p), the TR, in covering the LM, is still located vertical to it. The verticality of the TR to the LM is not essential, however, as shown by example (q) *He put his hands over his face*.

*Over* in the sense of covering can be derived by another route, starting from sentence (a). As we have already seen, (a) denotes the superior location of the TR, and absence of contact with the LM. The sentence has a further meaning nuance. Although the TR is not in contact with the LM, it is nevertheless construed as being fairly close to it, and can, in appropriate circumstances, exert an influence over it. In this respect, *over* contrasts with *above*. Thus, I am much more likely to be disturbed by noise from people living over me, than by people merely living above me. The idea of the TR influencing the LM comes out in (m): *Pull the lamp down over the table* (i.e. so that the table is illuminated by the lamp). Significantly, *over* in (m) cannot be replaced by *above*, a preposition which suggests, if anything, an absence of interaction between the TR and the LM. It is perhaps not too fanciful to see covering as a special instance of influencing. Certainly, the relative closeness of the TR to the LM, in (16a), seems a precondition for the semantic extension to covering.

So far, we have restricted our attention to some of the spatial uses of *over*. There are, in addition, a vast number of non-spatial, metaphorical uses. We shall deal with metaphor more fully in the next chapter, but a few examples will be appropriate at this point. A metaphorical use of *over* is exemplified in (17):

(**17**)  He has no authority over me.

This sentence is a metaphorization of (16a). The relationship between the TR and the LM is one of power, not of spatial orientation. In other words, we witness a transfer of the TR–LM relationship from the domain of vertical space to the domain of power relations. Power relations (like social organization, mentioned earlier) are typically conceptualized in terms of vertical space. Someone with power is 'higher' than someone without power. Hence a preposition denoting a higher vertical location comes to be employed to encode a position of greater power. *Over* is a particularly appropriate preposition in this case, since spatial *over*, as we have seen, often conveys that the TR is close enough to the LM to exert some kind of influence over it.

Significantly, *over* in (17) is not replaceable by *above*, a preposition which emphasizes the lack of influence of the TR on the LM. A further metaphorical use is exemplified in (18):

(**18**)  He got over his parents' death.

This sentence is related to (16e), where *over* denotes a path surmounting an obstacle. The metaphorization is made possible by the fact that life itself is often construed as a path, and difficult episodes during one's life as obstacles in the path. Based on (16k), *over* can designate the end-point of an activity or state of affairs, as in (19):

(**19**)  a.  Our troubles are over.
      b.  The lesson is over.
      c.  It isn't over till it's over.

The various senses of *over* that we have discussed form four major clusters. Firstly, there are the senses which have to do, in one way or another, with the higher location of the TR *vis-à-vis* the LM. Then there are the senses which indicate some kind of covering relationship between TR and LM. Thirdly, *over* designates a curved, arc-like movement. A final cluster of senses has to do with the end-point of a path. At the same time, each individual sense of *over* is itself a category with its own prototype structure. Let us consider the meaning exemplified in (16k): *He lives over the hill*. *Over*, in this sentence, is roughly equivalent to *on the other side of*. Some further examples:

(**20**)  a.  He has a farm over the river/on the other side of the river.
      b.  You'll find the bookshop over the street/on the other side of the street.
      c.  He lives just over the frontier/on the other side of the frontier.

Yet *on the other side of* is not replaceable by *over* in all cases. We would not usually speak of a bookcase being over (= on the other side of) the coffee table, or of a greenhouse being over the lawn. *Over* in (16k) is associated with a very specific 'image'. As already noted, the LM is construed as an obstacle situated between the TR and an observer (usually the speaker), such that the observer, in approaching the TR, would have to surmount the obstacle (e.g. by tracing an ascending-descending path). More abstractly, the LM is construed as a boundary separating the TR from an observer. Hence, we find restrictions on the kinds of entities which can serve as LMs. Hills, mountains, and walls are good instances of obstacles which must be surmounted, while rivers, streets, and national frontiers serve as good instances of boundaries. Lawns and coffee tables, on the other hand, are not (usually) thought of as obstacles to be surmounted, or as boundaries to be crossed. Hence the strangeness of saying that something is located over (= on the other side of) a lawn or a table. The wider applicability of *on the other side of* results from the fact that this expression does not share the image of *over*.

The details of the family resemblance structure of OVER that we have been

discussing are, needless to say, conventionalizations (albeit motivated conventionalizations) of the English language. There is no reason to expect that prepositional categories in other languages will be structured in a similar way, and indeed, a preposition in one language rarely has a single translation equivalent in another language. Yet the non-equivalence of prepositions across languages is no reason for accepting the view that prepositional usage is essentially arbitrary. Non-equivalence can be explained very simply in terms of different structurings of the categories, and in fact cross-language data even support the family resemblance approach advocated here. Let us suppose that a language has a lexical item with the meanings $A$, $B$, $C$, and $D$, as represented in (14). According to the meaning chain model of polysemy, the association of meanings $A$ and $D$ within the same category is dependent on the existence of the intervening links in the chain, $B$ and $C$. We can predict that if another language has a polysemous word with meanings $A^1$ and $D^1$ (i.e. with meanings identical to, or very close to, meanings $A$ and $D$), that word will also have meanings $B^1$ and $C^1$. (I ignore here the possibility that meanings $B^1$ and $C^1$ might have fallen into disuse, leaving $A^1$ and $D^1$ stranded, as it were, as (relatively) unrelated meanings of a single linguistic form.) Conversely, if $A^1$ has not extended in the direction of $B^1$, meanings $C^1$ and $D^1$ will be absent. The presence of meaning $B^1$, however, does not necessarily imply the existence of $C^1$ and $D^1$.

These predictions receive confirmation from a comparison of English and Italian prepositions (Taylor 1988). Italian *sopra*, like English *over*, is a place preposition one of whose meanings is "vertical to, not in contact with", cf. (16a):

(**21**)    La lampada pende sopra il tavolo.
        "The lamp hangs over the table"

*Sopra*, like *over*, can also imply a certain influence of the TR on the LM, cf. (16m):

(**22**)    Abbassa la lampada sopra il tavolo.
        "Pull the lamp down over the table"

(16m), we argued, can be regarded as a link in the chain which permits *over* to acquire the sense of covering, as in (16p) and (16q). Significantly, *sopra*, like *over*, can also encode a covering relation:

(**23**)    Si mise le mani sopra il viso. (cf. (16q))
        "He put his hands over his face"

So far, *sopra* closely parallels the semantic extension of *over*. But unlike *over*, *sopra* has not developed into a path preposition. Crucially (24):

(**24**)    L'aereo volò sopra la città.
        "The plane flew over the city"

does not mean that the plane *crossed* the city (a notion which would be expressed by the verb *sorvolare*), only that the plane's flight was located vertical to the city. In other words, in (24) *sopra* is a preposition of place, not of path. As predicted, none of the meanings exemplified in (16c–i) can be rendered in Italian by *sopra*. In contrast, the German cognate of *over*, *über*, as a path preposition, has a range of meanings very similar to English *over*, cf. (25a, b). In fact, the meaning chain goes further in German than in English. The LM need not be an obstacle or boundary on the path traced by the TR, it can simply be some entity located on the path. *Über*, in this sense, is roughly equivalent to English *via* (25c):

(**25**)  a.  Er ging über die Straße.
               "He walked over the street"
       b.  Er wohnt über der Straße.
               "He lives over the street"
       c.  Ich fahre nach Hamburg über Bremen.
               "I'm going to Hamburg via Bremen"

## 6.4  Some problems

The family resemblance model is a powerful tool for explicating the structure of such highly polysemous lexical items as prepositions. Yet there are a number of matters which will need to be clarified if the model is to come to maturity. I will discuss two particularly pressing issues here, and mention several more. The first concerns the possibility that some members of a family resemblance category might have a more central status within the category than others. If this is the case, what gives them their central status?

Wittgenstein, in his discussion of the category GAME, ignored the possibility that some games might be better examples of the category than others (see Section 3.1). He did recognize the existence of borderline cases, but otherwise he seemed to give all games the same status within the category. In discussing *climb*, I suggested that the sense in (8) might have central status. On the other hand, I have not taken any explicit position on whether some meanings of *over* are more central to the category than others, even though, by placing sentence (16a) at the top of the list of examples, I may have given the impression that this sense of *over* is to be accorded a more central, or basic status than the others. (We might note that this is the sense of *over* which is often listed first in dictionary entries.) Brugman (1981), in contrast, starts her discussion with the sense exemplified in (16b).

The claim that (16a) instantiates the central sense of *over* runs into difficulties. Recall Rosch's notion of basic level terms (Section 3.3). Basic level terms maximize category informativity: while categories might merge into each other at their boundaries, prototypical members of basic level categories are kept

maximally distinct. Suppose we regard *over* in the sense "vertical to, not in contact with" as a basic level term for the description of spatial relations. There are good reasons for this view. *Over*, in this sense, enters into a number of simple, and perceptually highly salient contrasts with other place prepositions, which likewise can be said to encode basic level relations. For example, the contrast between "superior to" and "inferior to" is realized by *over* vs. *under*; the contrast between "superior, without contact" and "superior, with contact" distinguishes *over* and *on*. There is, however, a problem, and that is the existence of the preposition *above*. *Above* has a much more restricted range of senses than *over*. But what we would probably want to identify as its central meaning coincides pretty closely with the putatively central meaning of *over*, i.e. "vertical to, not in contact with". Although, as already pointed out, there is a slight difference in nuance between *X is over Y* and *X is above Y* (*over* implies some kind of influence of the TR on the LM, *above* emphasizes the absence of interaction), it is a fact that in some cases the two words are practically interchangeable. The existence of two, partially synonymous lexical items conflicts with the very notion of a basic level term, as discussed by Rosch. It would be unrealistic to claim that *over* and *above* in their presumed central senses maximize category distinctiveness.

These problems would be eliminated by the selection of another sense of *over* as central. Evidence that it is the sense in (16e) (*He jumped over the wall*), rather than (16a), that is central, emerged from a small-scale experiment in which thirteen native English speakers were asked to write down as many sentences as they could think of containing the word *over*. At issue was which senses would be exemplified most often, and which would be elicited in first place. (Recall that when subjects are asked to list members of a category they tend to mention central members first; see Section 3.2.) Within the five minute time limit that was set, altogether 97 sentences were produced. The most frequent sense was that exemplified in (16e) (17 instances), followed by the deictic sense (16l) (*Come over here*: 13 instances), and two non-spatial senses (as illustrated by *The lesson is over*: 12 instances, and *Do it over again*: ten instances). The sense in *He jumped over the wall* also occurred more frequently than any other in initial position on subjects' answer sheets (11 occurrences in first position). Only one of the 97 sentences exemplified what we considered earlier to be the central sense of *over*.

What, though, is the theoretical status of this supposedly central sense? In the preceding discussion I have carefully avoided speaking of the prototype of a family resemblance category. The sense exemplified in (16e)—if indeed this is the central member of the category—is not the prototype in the sense in which this term has been used so far in this book. Membership in the category OVER is not established on the basis of similarity with the central member, but by the chaining process illustrated in (14). The central member of a family resemblance category thus does not have the same psychological status as the prototype representation of a monosemous category like BIRD. Neither are

the more peripheral senses of the category, such as that illustrated in (16q), at all comparable to the marginal members of a prototype category. For some family resemblance categories, especially those with a more limited structure, it might be feasible to claim that the central member shares a maximum number of attributes with other members. On this view, the central member of CLIMB would be that illustrated in (8); this sense exhibits the two attributes [ascend] and [clamber], only one of which is present in each of the other senses. For categories with a more complex structure, this approach is not possible. OVER has such a large number of members, none of which can legitimately be said to maximize attribute correlation within the category.

To some extent, the problem I am addressing is a consequence of terminology. I have spoken of family resemblance categories being structured through a process of extension. The metaphor implies a real-time, dynamic process, which begins at the centre of a category and proceeds outwards towards the periphery. However, as Lakoff and Brugman (1986) have noted, the structure attributed to a family resemblance category is to be interpreted more as a hypothesis concerning the 'synchronic connections in the semantic knowledge of the user' than as a recapitulation of a real-time process. The central member is thus that member from which all others can be most plausibly and most economically related. Fillmore (1982: 32) suggests an analogy between the central member and the reconstructed forms of historical linguistics; the one provides a rationale for describing the current state of polysemy in a language, the other for describing regular phonetic correspondences between related languages. On the other hand, degree of centrality does seem to be a psychologically and linguistically real notion. Colombo and Flores d'Arcais (1984) report evidence for the structuring of Dutch prepositions around central senses, while in Chapters 9 and 11 we shall see that hypothesized degree of centrality has a further linguistic correlate, namely with regard to productivity. To insist on the synchronic nature of category structure does not, though, rule out the possibility of implications for language history. Implications for language acquisition may also be drawn. We shall pursue such a possibility in Chapter 14.

The other problem with family resemblance categories concerns the range of meanings that can get associated within a category. (The problem was also raised, in another context, in Section 4.1.) In recent decades much theoretical work in linguistics has been concerned with the formulation of constraints, i.e. with restricting the notion of what is possible in a natural language. Are there constraints on the polysemization process (are there, in other words, 'impossible categories'), or can, in principle, anything get associated with anything else? According to Pulman, 'no language, it is safe to assume, has a name for a category consisting of just teacups, treacle and loud noises, or similar heterogeneous collections of things' (1983: 73). As regards the content of monosemous categories, this observation is no doubt correct. Polysemous categories, however, are a different matter. Meaning chains can establish links

between very diverse meanings. Consider a heterogeneous collection of entities comparable with Pulman's teacups, treacle, and loud noises, namely a collection comprising polishing pads, a dull yellowish colour, and amateur enthusiasts. There does exist in English a family resemblance category embracing precisely these objects—that denoted by the polysemous word *buff*.[6]

Approaching this issue intuitively, we might want to say, as a very general constraint, that a category, no matter how extended or rambling, cannot accommodate contraries. One feels, intuitively, that *over* could not mean both "superior to, not in contact with" and "inferior to, not in contact with", i.e. that *over* could not acquire the meaning of *under*. While this proposal seems reasonable enough, we can nevertheless point to cases where different meanings of a polysemous word are characterized by incompatible attribute specifications. The requirement, in (16a), that the TR is not in contact with the LM is dropped in (16p), while (16q) does not require that the TR be superior to the LM. *Climb*, in (8), obligatorily describes an ascent, while in (12), with an appropriate preposition, the word can describe a *descending* movement. Even more striking are cases where one and the same word has contradictory senses. *Sanction*, in one of its senses, means "permission, authorization". This sense happily coexists with the contradictory sense "prohibition, embargo". *Fast* usually denotes rapid movement (*He ran fast*), but the word can denote an absence of movement (*Hold fast*). Our first, putative constraint must therefore be rejected.

The feeling that *over* could not extend so as to include the meaning of *under* perhaps reflects the fact that the meaning "under" is already lexicalized in the language. We might thus suggest, as a second constraint, that category extension will be restricted by the existence of neighbouring categories. It seems reasonable that a category may extend in order to fill semantic gaps in the language, i.e. to express meanings not already conventionally lexicalized. By the same token, we might suppose that a meaning chain will be cut short once it begins to encroach on the range of meanings associated with some other category. Our study of *over* suggests that this putative constraint is also invalid. Nothing has prevented *over* from encroaching on the semantic space of *beyond*, *across*, and *on the other side of*. Although these expressions are far from synonymous with *over*, they are interchangeable with *over* in some contexts (e.g. *He walked over/across the street*). Again, these are not isolated examples. Arguably, the central sense of Italian *sopra* is very similar to one sense of *over*, i.e. "superior to, not in contact with". Yet *sopra* can be used to

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[6]  It would seem that the historically earliest, though now obsolete, sense of *buff* was "buffalo" (Ayto 1990: 83). The word then came to be used of buffalo hide, and of leather in general. The use of *buff* as a colour term relates to the typical colour of leather, while the sense "polishing pad" relates to the use of such pads in processing leather. The sense "amateur enthusiast", as in *opera buff*, has a more complex history. It appears that in the 1820s, volunteer firefighters in New York City came to be known as 'buffs' on account of their buff-coloured uniforms. Subsequently, the word came to be used of any amateur enthusiast.

describe a situation in which the TR and the LM are in contact (*Siediti sopra quella sedia* "Sit on that chair"). Here, *sopra* encroaches on the meaning of *su* "on". Indeed, in a large range of sentences, *sopra* and *su* are virtually interchangeable (Taylor 1988).

Should we therefore conclude that family resemblance categories are not subject to any constraints at all, that, in principle, practically anything can get associated with anything else within a category? This appears to be the position of Langacker (1987: 17): 'an entity [will] be assimilated to a category if a person finds any plausible rationale for relating it to prototypical members.' And on the required degree of similarity with the prototype, Langacker observes that 'there is no specific degree of departure from the prototype beyond which a person is absolutely incapable of perceiving a similarity'. Perhaps, in the last analysis, a search for constraints (in the sense of absolute prohibitions on possible category structure) is merely a relic of what we might call the classical mind-set. Linguists who operate with classical categorization models instinctively look for clear-cut principles, not least in their study of the categories of language itself. A prototype mind-set, on the other hand, leads one to accept, even to expect, fuzziness and gradualness. But if it is not possible to state absolute constraints on the content of family resemblance categories, it might none the less be the case that certain kinds of meaning extension are more frequent, more typical, and more natural, than others. In other words, we should be looking for recurrent processes of meaning extension, both within and across languages, rather than attempting to formulate prohibitions on possible meaning extensions.

A cataloguing of preferred means of category extension might also shed light on a further problem with the approach presented here. A mature model of family resemblance categories needs to have at its disposal some principled means for deciding between alternative descriptions. Given alternative accounts of the relations holding between the meanings of a polysemous category—and alternatives are not difficult to come up with; my account of *over* does not accord in every detail with Brugman and Lakoff—on what basis do we prefer one description rather than another? The final problem with family resemblance categories, indeed with all categorization models, concerns the processes by which different things get associated in the first place. We shall address some aspects of this problem in the next chapter.

# Study questions

1. *Climb* may be characterized as a manner-of-motion verb. Other manner-of-motion verbs in English include *jump*, *creep*, *crawl*, and *run*. Like *climb*, these verbs also have a wide range of different uses. Collect examples of how these verbs are used, then try to organize their different senses in family

resemblance categories. (For a detailed analysis of *crawl*, see Fillmore and Atkins 2000.)

**2.** We could say that there is water 'all over the floor', but it would be odd to speak of there being a carpet 'all over the floor'. Similarly, we might say that there are grease stains 'all over the tablecloth', but hardly that there are red and white squares 'all over the tablecloth'. What does your lecturer mean, when she tells you that your research essay is 'all over the place'? On the basis of these and other examples, how would you characterize the proto-typical sense of *all over*? In what way(s), if any, is this prototypical sense related to other uses of *over* and *all*? (For an account of *all over*, see Queller 2001.)

**3.** Compare the uses of the prepositions *over* and *above*, in both their spatial and non-spatial senses. Consider the fact that in some contexts, both pre-positions are admissible, possibly with slightly different meaning nuances. When might you refer to a salary which is 'over $50,000 a year', and to a salary which is 'above $50,000 a year'? Consider also contexts in which only one of the words is appropriate. You could say of a public figure that he is 'above all suspicion', but not that he is 'over all suspicion'. Conversely, you would say that a person has influence 'over you', but not that she has influence 'above you'. How might these differences between the prepositions be handled in terms of a family resemblance model of polysemy? (You might also extend your study to include the converses of *over/above*, namely *below*, *underneath*, and *under*.)

# Further reading

On the radial model of polysemy, see Lakoff (1987*b*), esp. Case Studies 2 and 3.

On polysemy vs. vagueness, see Zwicky and Sadock (1975), Kempson (1977: 123 ff.), Cruse (1986: 54 ff.), Geeraerts (1993), Tuggy (1993), and Taylor (2002: ch. 23).

Polysemy is the topic of the collected volumes edited by Ravin and Leacock (2000) and by Cuyckens and Zawada (2001).

For a somewhat different perspective on *climb* from that presented in this chapter, see Jackendoff (1990: 35, 76–7).

On prepositions, see Jackendoff (1973), Rauh (1991), and Zelinsky-Wibbelt (1993).

Brugman (1981) spawned a veritable cottage industry of *over* studies. Some of the more recent include Dewell (1994), Kreitzer (1997), Tyler and Evans (2001*a*), and Queller (2001). For studies of the translation equivalent(s) of *over* in other languages, see Taylor (1988) on Italian *su* and *sopra*, and Geeraerts (1992) on Dutch *over*.

# Category Extension: Metonymy and Metaphor

In the last chapter we examined in some detail the structure of two poly-semous lexical categories in English, namely, those associated with the words *climb* and *over*. Most lexical items are polysemous, to a greater or lesser extent. A polysemous item associates a phonological form with a number of more or less discrete though related meanings, which cluster in a family resemblance category. A major topic in the study of polysemy, therefore, concerns the kinds of links that can exist between meanings, and how it is that distinct meanings come to be associated in the first place. In this chapter we look at two of the most important of these processes, metaphor and metonymy.

Metonymy and metaphor are familiar concepts of traditional rhetoric. Metaphor, especially, has been the object of much research by linguists and literary scholars, and there is a vast literature on the subject. I begin, however, with the no less important phenomenon of metonymy.

## 7.1 Metonymy

Metonymy has received relatively little attention (at least, in comparison with metaphor) in the linguistics literature. (See, however, Panther and Radden 1999 for some recent accounts.) We may begin by considering the traditional view. Traditional rhetoric defines metonymy as a figure of speech whereby the

name of one entity $e^1$ is used to refer to another entity, $e^2$, which is contiguous to, or which is associated with $e^1$. This process of transferred reference is possible in virtue of what Nunberg (1978) calls a 'referring function'. There is a referring function which permits the name of a container to refer to the contents of the container, as when we say *The kettle's boiling*, meaning, with this sentence, not that the kettle as such is boiling, but that the water in the kettle is boiling. Similarly, a referring function permits the name of a producer to refer to the product (*Does he own any Picassos?*, *Dickens is on the top shelf*). A subcategory of metonymy is **synecdoche**; here, reference to the whole is made by reference to a salient part: *We need some new faces around here*. Alternatively, the name of an institution may stand for an influential person or group of influential persons who work in the institution (*The Government has stated . . .*). Sometimes, multiple metonymies are in operation. When we talk of *negotiations between Washington and Moscow*, we are using the names of places to refer to important persons associated with institutions located in those places. Metonymy also permits the name of a token to refer to the type. The salesman who comments that *This jacket is our best-selling item* intends to convey, not that the particular jacket has been sold many times, but that jackets made to that design have sold well.

The referring functions illustrated in the above examples are quite productive. One can in general use the name of a well-known creative artist to refer to the artistic creations of the artist. A government can in general be referred to by the name of the city in which the government is located. But the referring functions are not fully productive, in that not any product, for example, can be referred to by the name of the person who created it. I could hardly say *Mary was delicious*, meaning by *Mary* the cheesecake which Mary made, in spite of the analogy between Mary's mixing and processing of ingredients to produce her cake and Picasso's mixing and application of colours to produce his paintings. Any given instance of a referring function needs to be sanctioned by a body of knowledge and beliefs encapsulated in an appropriate frame. It is a widespread belief in our culture that works of art are unique, and that their uniqueness is due to the genius of the individuals who created them. No such unique relationship would normally be believed to hold between a cake and the person who baked it. Certain specialized situations do, however, permit the use of referring functions which are not sanctioned outside those situations. A waiter may comment to his colleague that *The pork chop left without paying*. Reference to a customer through the name of the dish which the customer ordered is possible because of certain features of the restaurant situation, in particular the fact that waiters interact with customers principally for the purpose of taking and delivering the customers' orders. Customers can thus be identified with respect to the dishes which they have ordered.

These examples suggest that the essence of metonymy resides in the possibility of establishing connections between entities which co-occur within a given conceptual frame. This characterization suggests a rather broader

understanding of metonymy than that given by traditional rhetoric. The entities need not be contiguous, in any spatial sense, neither, as we shall see, is metonymy restricted to transferred reference. On this broader view, metonymy turns out to be one of the most fundamental processes of meaning extension, more basic, perhaps, even than metaphor.

At this point, the question arises, why speakers should make use of metonymy at all. Why should a speaker choose to refer to $e^2$ by using an expression whose basic meaning involves reference to $e^1$? Why don't speakers say what they mean? Why should they seemingly complicate matters by making statements which are at variance with their real intentions? What, in other words, is the cognitive motivation of metonymy?

In order to get a handle on this, consider the fact that when talking about an entity, we frequently highlight different aspects of its constitution. Langacker (1990a) refers to this as the **active zone** phenomenon; certain facets of an entity are more 'active' in a conceptualization than other aspects. When we 'wash a car' we have in mind the car's exterior, not all the parts of the car; when we 'vacuum-clean the car' we highlight its upholstered interior; to 'fill up a car' is to fill up only the petrol tank; while to 'service a car' involves its mechanical parts. We would not, in these examples, want to censure a speaker for speaking imprecisely, that is, for not saying 'literally' what he means. In fact, if the above examples were to be rephrased so as to express exactly and precisely what a speaker intended, the results would be intolerably wordy. Imagine having to tell the petrol station attendant, every time you go to have your car 'filled up', exactly which component of your car you wish to have filled up, and what you want it filled up with! There is also the possibility that, no matter how wordy an expression is, it might still fall short of full and complete accuracy. We readily accept the 'looser' way of speaking since our encyclopaedic knowledge of the entities concerned, and the manner in which we interact with them, provides access to the active zone that is intended. In other words, the named entity (in the above cases, the car) functions as a cognitively salient and easily identified **reference point** which facilitates identification of the intended active zone. As Langacker has pointed out, the difference between the active zone phenomenon (as exemplified by *wash the car*) and full-fledged metonymy (*Dickens is on the top shelf*) is simply a matter of degree. In the latter example, reference to the man, Charles Dickens, provides cognitive access to the literary creations for which he is remembered (more specifically, to printed instantiations of these creations—another metonymy!).

With respect to the *car* examples, we would not want to say that *car* is polysemous, even though the word is being used to refer, strictly speaking, to different real-world entities, merely that, in Cruse's terminology, the meaning of *car* is 'contextually modulated' (Cruse 1986: 52 f.). Note, for example, that we can easily coordinate the different uses, without any hint of that kind of incongruity known as zeugma (*They washed, vacuum-cleaned, and serviced the car*). Yet the process of contextual modulation clearly contains the seeds of

polysemy. Consider the examples *door* and *window*. Both doors and windows, like cars, may be conceptualized as unitary structures (*I bought a car*, *The room has two doors*, *The workmen delivered the window*). Alternatively, we can focus on the movable part of the structure (*Open the door*, *Close the window*), or on the aperture created when the moving part is opened (*He walked through the door*, *She put her head through the window*). Here, the contextually modulated meanings are beginning to acquire an independent status. Symptomatic is the potential ambiguity of *He walked through the door*. (Are we talking about a real person passing through the door aperture, or about a ghost passing through the solid structure?) Or consider *The sound of voices came through the door*. (Was the door closed or open?) As evidence for the emerging polysemy of *door*, Cruse (1986: 65) notes the zeugmatic effect of coordination:

(**1**)  We took the door off its hinges and then walked through it.

Zeugma also results from the co-ordination of different senses of *window*:

(**2**)  I painted the window while she was sitting in it.

The different senses of *door* and *window* illustrated above are related through metonymy, on the broader understanding of the term proposed above. Speakers of English have a good deal of common-sense knowledge about doors and windows. They know, for example, about their usual shape, size, and manner of construction, and about their function and usual location. This kind of knowledge is held together in what we might call (with apologies for the pun) our 'door' and 'window frames'. Different uses of *door* and *window* 'perspectivize' different components of the respective frames. It is perhaps significant that most speakers of English need to think twice before becoming aware of the variable reference of words like *door* and *window*. This is probably because the frame-based knowledge is so closely integrated, and the background cultural knowledge that is presupposed is so much taken for granted.

There are countless instances in the lexicon of metonymic extension by the perspectivization of a component of an integrated conceptual structure. I will mention a couple of examples. The first—the verb *close*—is based on Jongen (1985). The act of closing involves the manœuvring of some device with respect to a container, with the purpose of preventing access to, or escape from, the container. These two components of the act of closing (i.e. manœuvring the closing device and preventing access to a container) are so intimately associated—the second necessarily presupposes the first—that it probably takes a moment's thought to keep them separate. Yet the verb *close*, as well as its translation equivalents in many other languages, can be used in two quite distinct ways, which reflect the conceptual distinction that has just been made. Firstly, *close* can designate the closing process in its entirety. In this case, the name of the container functions as the direct object of the verb, as in *close the box*, or, with a less prototypical container, *close the office*. But

*close* can also refer only to the first component of the closing process, i.e. to the placing in position of the device which prevents access to (or escape from) the container. Here, the direct object of the verb is the name of the closing device, as in *close the lid*, *close the door*. In some cases, the semantic distinction is blurred. In *close your mouth*, is *mouth* to be taken to be a container, or the device which closes off access to a container? In other cases, there may be uncertainty as to which component of the closing process is implicated. Failure to close a container, as in *I couldn't close the jar*, may be due to the non-availability of a closing device or simply to the bad fit of the closing device. The alternative interpretations are made explicit in the following examples.

(3)  a.  I couldn't close the jar because I couldn't find the lid.
    b.  I couldn't close the jar because the lid didn't fit.

A further illustration is provided by the word *mother*. As discussed in Lakoff (1987*b*), a full understanding of *mother* needs to make reference to a number of different domains, including the nurturance, the genetic, the birth-giving, the marital, and the genealogical domains. Not all uses of *mother* activate each of the domains to the same extent. Sometimes only one domain is involved. Thus (4a) perspectivizes the nurturance domain, while (4b)—cf. Lakoff (1987*b*: 76)—perspectivizes the birth domain:

(4)  a.  He's looking for a girlfriend who'll be a mother to him.
    b.  Necessity is the mother of invention.

When *mother* is used as a verb (*to mother a child*), the nurturance domain is again perspectivized while the other domains are eclipsed. You can mother a child, even though you are not the genetic mother. The verb simply means "treat with caring affection, as a mother". One could even speak of a man 'mothering a child'. (Note that the analogous expression *to father a child* perspectivizes, in contrast, only the genetic domain.)

Especially widespread are cases of metonymic extension through what we might call the **perspectivization of an implicature**. Consider two of the meanings of the verb *leave*, illustrated by *leave the room* and *leave something in a room*. The first example designates the movement of a trajector from the inside of an enclosed space; in this case, the direct object of *leave* designates the enclosure. But if one leaves an enclosed space, one distances oneself from those entities which stay put. It is through a perspectivization of this implicature that *leave* can also mean "not to take with one", i.e. "leave behind". The entity that is 'left' need not be located in an enclosed space (*I left my shoes outside*). Moreover, the act of leaving behind can be intentional or unintentional. In the latter case, *leave* comes to mean "forget to take with one" (*Where did I leave my car keys?*). The different senses of *leave* are chained together by a series of metonymic relations.

Another example of this phenomenon is provided by the French verb *chasser*. (Again, the example is from Jongen 1985.) In one of its senses, *chasser* means "pursue (an animal) with the aim of catching and/or killing it", i.e. "hunt". This sense is etymologically basic (< Vulgar Latin *captiare* "try to catch" < *capere* "catch"). Now, our common-sense knowledge of the world includes the information that if we pursue an animal, the animal will run away. A second sense of *chasser* (i.e. "chase away") perspectivizes this common-sense knowledge. Whereas the animal's attempt to run away was merely a troublesome aspect of hunting, we now pursue an animal with the aim of making it run away. Released from the hunting frame, this second meaning can now be applied to all manner of troublesome creatures, like insects, adult humans, and children.[1]

Metonymy involves transfers between closely associated elements of a conceptual frame. Given the ubiquity of the phenomenon, it would be an easy matter to fill up the rest of this chapter by a further listing of examples. However, a topic of particular concern must be to identify general processes of metonymic extension. The question is important in connection with the need to constrain polysemous categories—a word, one feels, cannot be extended to mean anything at all. In view of the flexibility and creativity of our conceptual life, we should not expect to be able to formulate categorial rules for meaning extension, such that one would be able to predict with certainty which meaning extensions will or will not be possible in any particular instance. One may, however, search for common patterns of meaning extension, patterns which recur in case after case throughout the lexicon of a particular language, and in different languages.

I will therefore devote the remainder of this section to a discussion of some frequent patterns of meaning extension which are exhibited, especially, by prepositions. The overwhelming majority of spatial senses of *over* which were examined in such detail by Brugman (1981) are related through metonymy; moreover, the metonymies in question are exhibited by other prepositions as well (Taylor 1993). Consider, first of all, the notions of path and place (cf. Lakoff and Brugman 1986). There is a metonymic relationship between the path followed by a moving entity and any one of the infinite number of points located on the path. It frequently happens that a prepositional phrase which designates a place can also designate a path which 'passes through' the place. The relationship is, in essence, an instance of synecdoche, whereby a speaker refers to the whole by naming only a part.

(5) a. The helicopter flew *over the city*. (path)
     b. The helicopter hovered *over the city*. (place)

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[1] Note that *chasser* exemplifies the by no means infrequent phenomenon alluded to in s. 6.4, namely, the association of two partially contradictory senses—"pursue with the aim of catching", "pursue with the aim of chasing away"—with one and the same linguistic form.

(**6**)  a.  He drove *by the post office*. (path)
  b.  He lives *by the post office*. (place)

(**7**)  a.  The road passes *under the railway line*. (path)
  b.  The dog is *under the table*. (place)

A particularly salient point on a path is the end-point. A prepositional phrase designating a path not infrequently also designates a place construed as the end-point of a path:

(**8**)  a.  He walked *over the hill*. (path)
  b.  He lives *over the hill*. (place, construed as end-point of a path)

(**9**)  a.  He walked *across the street*. (path)
  b.  He lives *across the street*. (place)

Somewhat similar is the polysemy of goal and place; the one sense has to do with a static relation construed as the final state of an activity, the other with the static relation *tout court*:

(**10**)  a.  We hung the picture *over the sofa*. (goal)
  b.  The picture hangs *over the sofa*. (place)

(**11**)  a.  I put the money *in my wallet*. (goal)
  b.  The money is *in my wallet*. (place)

Less frequent is the polysemy of place and source, as illustrated in (12) and (13):

(**12**)  a.  He came *out of prison*. (source)
  b.  He is now *out of prison*. (place)

(**13**)  a.  The child was taken *away from her parents*. (source)
  b.  The child now lives *away from her parents*. (place)

More usually, the source relation needs to be specially encoded, e.g. by the use of a complex prepositional phrase:

(**14**)  a.  The book is *under the table*. (place)
  b.  He put the book *under the table*. (goal)
  c.  He took the book *from under the table*. (source)

Another natural metonymic relation exists between what Lakoff (1987*b*: 428 ff.) and Talmy (1988) refer to as **mass** vs. **multiplex** conceptualizations. An assembly of entities may be conceptualized either in terms of its constituent members, i.e. as a multiplex, or as an undifferentiated mass. The alternative conceptualizations are related by the everyday experience that an assembly of individual entities, if viewed from a sufficient distance, is indeed perceived as an undifferentiated mass. A specific instance of this kind of relationship exists between a one-dimensional line and a series of points which constitute a line. Thus we find that the same linguistic form can invoke both a continuous line and a linear configuration of entities:

(**15**) a.  There were soldiers posted *along the road*. (separate entities)
    b.  The railway track ran *along the road*. (one-dimensional line)

(**16**) a.  There were trees planted *around the house*. (separate entities)
    b.  There was a moat *around the castle*. (one-dimensional line)

A similar kind of relationship exists between a two-dimensional area and an assembly of entities located within an area (17), as well as between a two-dimensional area and the points making up a convoluted path which, in the limiting case, can completely 'cover' the area (18).

(**17**) a.  The child threw his toys *all over the floor*. (two-dimensional array of separate entities)
    b.  He spilled water *all over the floor*. (two-dimensional area)

(**18**) a.  The cat walked *all over the floor*. (convoluted path 'covering' an area)
    b.  There was mud *all over the floor*. (two-dimensional area)

It is, of course, this relationship which helps to sanction the extension of *over* in the direction of "covering".

Place, goal, and path, as well as mass and multiplex conceptualizations, are **image schemas** (referred to in Section 5.3, and discussed in more detail below) which structure a conceptual domain. In the above examples, we have restricted our attention to the spatial domain. But the same image schemas also structure other domains, e.g. the domain of time. Just as a thing can be located *at* a point in space, so also a punctual event occurs *at* a point in time. In both cases, the internal constitution of the located entity is not at issue; both are conceptualized as zero-dimensional. As we have seen, a line may be construed as a series of points; analogously, a series of punctual events may be conceptualized as a single, temporally protracted event. A line may also be construed as the path followed by a moving point; similarly, a temporally protracted event can be seen as an event in progress, i.e. as an activity, the completion of the event being analogous to the end-point of a path. Significantly, verbs can be polysemous in the same way as prepositions. Thus a verb can denote the single occurrence of a punctual event, or a series of occurrences:

(**19**) a.  The light *flashed* once. (punctual event)
    b.  The light *flashed* for half an hour. (series of punctual events)

(**20**) a.  The boy *kicked* the ball (once).
    b.  The boy *kicked* the ball for half an hour.

Similarly, the same linguistic expression can designate an unbounded activity (equivalent to an unbounded path) or an activity which has an inherent termination (equivalent to a path terminating at a goal).

(**21**) a.  We *walked* in the forest. (unbounded activity)
    b.  We *walked* home. (activity terminating at a goal)

With these examples, we witness the application of spatial schemas to non-spatial domains. In this respect, we are already encroaching on the phenomenon of metaphor. It is to metaphor that we now turn.

## 7.2 Metaphor

The study of metaphor has been an important site for research within the cognitive linguistic paradigm; a significant landmark in this respect was the publication in 1980 of Lakoff and Johnson's *Metaphors We Live By*. In fact, the contrast between the cognitive and the autonomous generative paradigms is especially striking with respect to their approaches to metaphor. Before discussing the cognitive approach, it may be useful, therefore, to briefly outline some of the salient characteristics and corollaries, as well as some of the problems, of the autonomous linguistic approach.

Metaphor has always been something of an embarrassment to generative linguistics. The source of the problem lies in the view that the meanings of words can be represented as bundles of necessary and sufficient features. Meanings, on this approach, emerge as entities with clear-cut boundaries. The possibility of combining words into phrases is then a question of the compatibility of the feature specifications of the component forms, compatibility being formalized in terms of selectional restrictions. The acceptability of word combinations is necessarily also a clear-cut matter: either the feature specifications are compatible, or they are not. Within this tradition, the essence of metaphor is captured by the notion of a violation of a selectional restriction. The approach taken by Botha (1968) with regard to these violations is representative of a whole generation of linguists. Botha distinguished between novel, creative metaphors (which violate the semantic rules of a language), and established, or dead metaphors (which do not). Novel metaphors, Botha claimed, lie outside a speaker's competence, and thus outside the scope of linguistics proper. Competence has to do with a speaker's 'rule-governed creativity', not his 'rule-changing creativity' (1968: 200). By violating a rule, a speaker is in effect going beyond his competence, thus changing his grammar. But once a metaphorical expression has been created, the speaker's internalized rule system is thereby modified. Metaphor thus ceases to be an instance of deviance; one might even say, metaphor ceases to be metaphorical. The metaphorical sense of a lexical item is now listed in the lexicon along with its other 'conventional senses' (1968: 201). On the one hand, then, metaphor is declared out of bounds to linguistic semantics, otherwise it is assimilated to any other instance of polysemy/homonymy.

The view that metaphor lies outside the study of linguistic competence proper underlies Searle's (1993) well-known account. The sentence in (22) is, if taken literally, semantically anomalous.

(**22**) Sally is a block of ice.

*Ice* (and *block of ice*) possesses the feature [−ANIMATE]; one cannot therefore predicate 'be a block of ice' of an entity (*Sally*) which is [+ANIMATE]. The sentence is only acceptable to the extent that a listener can go beyond the literal meaning and construe the speaker's intended meaning. To perform this task, the listener needs to supplement linguistic competence with proficiency in pragmatics. Searle's account thus presupposes a distinction between **semantics** and **pragmatics**, the former having to do with literal, or purely linguistic meaning, the latter with the context-dependent construal of intended meaning. Over the past few decades, pragmatics has emerged as an important subdiscipline of linguistics, taking its place alongside the more traditional components of linguistic study, such as phonology, syntax, and semantics. Given the basic assumptions of the generative paradigm, the emergence of pragmatics as an independent object of study was perhaps inevitable. If language constitutes an autonomous cognitive system, then, given the self-evident fact that language is an instrument for conceptualizing and interacting with the world, the need arises for an interface that links these otherwise independent systems. Pragmatics functions as precisely such an interface. In rejecting the notion of an autonomous linguistic faculty, cognitive linguistics necessarily removes the need for pragmatics as a separate branch of study. All meaning is, in a sense, pragmatic, as it involves the conceptualizations of human beings in a physical and social environment. The understanding of *any* utterance requires an act of context-sensitive interpretation by the listener/hearer (Bosch 1985); metaphorical utterances, on this view, do not form a special set.

   Observe that Searle's account predicts that metaphorical interpretations should take longer to process than literal interpretations, since, in order to arrive at the metaphorical interpretation, a listener first needs to access the literal reading, subsequently to reject it as anomalous. This prediction has not been borne out (Gibbs 1994). This finding is not all that surprising, considering the conceptual problems associated with the Searlean view of metaphor as grammatical deviance, and the consequent need for the listener to 'correct' the utterance for its deviance. (For a devastating criticism of the Searlean account, see Cooper 1986: 68 ff.). First, the supposed deviance of metaphor implies that competent speakers of a language ought to be able to 'demetaphorize' each metaphorical expression that they encounter, thereby restoring the expressions to full grammaticality. In practice, it is often difficult, if not impossible, to replace a metaphorical expression by a non-metaphorical equivalent and still retain the sense of the original expression. Secondly, it is highly counter-intuitive to claim that anything as pervasive as metaphor should have to be accounted for in terms of rule-breaking: metaphor is 'such a familiar and ubiquitous ingredient of speech that [. . .] few stretches of every-day conversation would escape the presumption of censure' (Cooper 1986:

78). Furthermore, the very pervasiveness of metaphor argues strongly against the deviance hypothesis; being endemic, metaphor would eventually destroy the norm against which deviance is to be recognized. Finally, the question arises why any bona fide communicator should wish to do such a bizarre thing as intentionally to produce utterances which are grammatically deviant, only so that their conversational partner can mobilize all kinds of interpretative principles in order to arrive at the intended meaning. Why don't people say what they mean in the first place?

The cognitive linguistic approach to metaphor does not give rise to this conundrum, since metaphor is not understood as a speaker's violation of rules of competence. Rather, metaphor is seen as a means whereby more abstract and intangible areas of experience can be conceptualized in terms of the familiar and concrete. Metaphor is thus motivated by a search for under-standing. It is characterized, not by a violation of selectional restrictions, but by the conceptualization of one cognitive domain in terms of elements more usually associated with another domain. It is thus not surprising that meta-phor should abound in precisely those kinds of discourse where speakers are grappling with the expression of concepts for which no ready-made linguistic formulae are available. Obvious examples are poetic, mystical, and religious texts. Metaphor plays an essential role in scientific enquiry, too (Hoffman 1985). A nice example is discussed at length in the opening chapter of MacCormac (1985). In their studies of cognition, psychologists, some more explicitly than others, have drawn analogies with the functioning of a com-puter; 'cognition' is the 'computation' produced by the 'hardware' of the brain operating under the control of the 'software' of the mind (1985: 9). Salmond (1982) also draws attention to a number of metaphors which underlie the pursuit of anthropology. Recently, Lakoff and Núñez (2000) explore the metaphors which underlie mathematical concepts, such as the concept of infinity. The discipline of linguistics provides many examples, too. Linguists in the Chomskyan tradition speak of *deep*, *shallow*, and *surface* levels of syn-tactic representation, structures undergo *transformations* and are often pre-sented in the form of *tree* diagrams. It is normal, in cognitive linguistics, to distinguish between *central* and *peripheral* exemplars of a category; meanings are *chained* together to form *networks* with a *family resemblance* structure. These metaphors are more than just pedagogical aids. The conceptualization of the subject-matter entailed by the metaphors constitutes the very essence of the theories in question.

It is not only in specialized discourse that metaphor abounds. As Lakoff and Johnson (1980), and many subsequent works, richly document, much of our understanding of everyday experience is structured in terms of metaphor. For an illustration we need go no further than the cluster of metaphors that Lakoff and Johnson (1980) discussed in their opening chapter. Here, Lakoff and Johnson drew attention to the military source of the language we use in talking of intellectual argument. When taking part in an argument, we set up

positions; we attack, defend, and retreat; and we end up winning or losing. These metaphorical expressions are made possible in virtue of what Lakoff and Johnson call a **conceptual metaphor**, namely ARGUMENT IS WAR. The domain of intellectual argument is understood in terms of war. Elements from the domain of war—things like attack, defence, retreat, etc. (note that it is not a prerequisite that people have had personal experience of war; they merely need to draw on conventionalized knowledge encapsulated in the war-making frame)—are projected on to the abstract domain of intellectual argument. The basic 'logic' of the donor, or **source domain** (i.e. war), is applied to a different area of experience, the receptor, or **target domain**, i.e. argument. The process gives rise to a number of metaphorical entailments. Wars typically end in victory for one party, or at least in a truce. Thus an argument must end in victory, or, in the limiting case, in stalemate. An argument which ends up in amicable agreement has already ceased to be an argument.

A particularly interesting line of enquiry is suggested by Johnson (1987) and Lakoff (1987*b*: 271ff.). They discuss the possibility that many areas of experience are metaphorically structured by means of a rather small number of **image schemas**. Amongst these image schemas are the following:

(a)  Containment. The image schema evokes a container, with its inside and outside, in the domain of three-dimensional space. The image schema is applied metaphorically to a large number of non-spatial domains. Linguistic forms are conceptualized as containers (*put ideas into words*, *the contents of an essay*, *empty words*; see Reddy 1993), as are emotional states (*be in love*, *fall out of love*).

(b)  A journey and its component parts (source, path, and destination, with possible obstacles and detours on the way). Life itself is frequently conceptualized as a journey (*My life isn't getting anywhere*, *He's come a long way*, *We're going round in circles*), as is the progress (i.e. moving forward) of society (*He's a progressive*, *She's ahead of her time*, *They're fellow travellers*).

(c)  Proximity and distance. Once again, a schema based on spatial relations is projected on to non-spatial domains. Thus degree of emotional involvement and the possibility of mutual influence are understood in terms of proximity (*a close friend*, *a close adviser*, *keep one's distance*).

(d)  Linkage and separation. Closely related to the proximity–distance schema is the schema of linkage and separation. Again, basically spatial notions can be applied to abstract relations. We *make contact* with people, we *keep in touch*, and we *break* social and family *ties*.

(e)  Front–back orientation. This schema is applied, in the first instance, to the human body. The front of a human body is that side on which major sensory organs, especially the eyes, are located. The front also faces in the

direction in which a human being normally moves. A particularly wide-spread conceptual metaphor applies this schema to orientation in time. The future lies in front (*look forward to the future*), while the past is at one's back (*look back on the past*). Events, too, have fronts and backs. Many languages make no formal distinction between 'in front of' and 'before', and between 'behind' and 'after'. What is in front of an event is what happens before; what is behind, happens after.

(f)  The part–whole relationship. The whole consists of parts arranged in a specific configuration. The separation or rearrangement of the parts results in the destruction of the whole. Primarily, this schema is applied to discrete, concrete entities. Metaphorically, it can be applied to a range of abstract notions, for example, interpersonal relations. A married couple form a whole; on divorce they *split up*, or *break up*; later, they may *come together* again.

(g)  Linear order. Primarily, this schema arranges objects in a one-dimensional line. Metaphorically, the ordered arrangement can be applied to temporal sequence. What occurs *first* happens before, what comes *second* occurs later.

(h)  Up–down orientation. Primarily, this schema has to do with spatial orientation within a gravitational field. We examine in detail some of its metaphorical applications below.

(i)  Mass vs. multiplex conceptualizations. Some aspects of these alternative ways of viewing objects and events have already been mentioned.

Johnson and Lakoff suggest that these image schemas might be so deeply grounded in common human experience that they constitute, as it were, universal pre-linguistic cognitive structures. Many of the schemas clearly derive from the most immediate of all our experiences, our experience of the human body. The experiential base of containment is the human body with its surface separating the inside from the outside. The body, with its various parts which make up the whole, and with its front clearly distinct from its back, is also a permanent exemplar of the part–whole and front–back schemas, while our existence in a gravitational field provides the basis for the up–down schema.

Let us examine more closely the metaphorical applications of the up–down schema in English, concentrating on the lexical item *high*. In its literal sense (Dirven and Taylor 1988), *high* is characterized against the domain of three-dimensional space. There are two distinct spatial senses, extensional *high* (*high¹*), as in *high building*, and positional *high* (*high²*), as in *high ceiling*. The first sense denotes the greater than average vertical extent of an entity, while the second denotes the above average location of an entity on the vertical dimension. The meanings are related through metonymy. If an entity is *high¹*,

then its uppermost part is *high²*. It is the second sense of *high* which is subject to metaphorical extension in English.

In denoting the position of an entity in vertical space, *high²* normally implies a zero point, or origin, from which vertical distance is measured, as well as a norm with which the high entity is implicitly compared. In many cases, the zero point is provided by ground level (as in *high telegraph wires*) or floor level (*high ceiling*), while in *high plateau* the zero point is sea level. In other cases, the zero point is provided by the domain against which the entity is conceptualized. A *high shelf* is located higher than the norm within the domain of, for example, a bookcase, a *high waistline* against the domain of an article of clothing, while in *high shoulders* the domain is the human torso. Possibly, it is the very flexibility of *high²*—the fact that the zero point and the norm are selected according to the domain of the profiled entity—that renders the word so available to metaphorical extension.

Metaphorical extension becomes possible in virtue of conceptual metaphors which map the up–down schema on to other areas of experience. There are three major conceptual metaphors in English which involve the up–down schema. These concern the domains of quantity (MORE IS UP, LESS IS DOWN), evaluation (GOOD IS UP, BAD IS DOWN), and control (POWER IS UP, POWERLESS-NESS IS DOWN). There are also one or two minor conceptual metaphors that map the up–down schema on to sensations of pitch and smell, as shown in expressions like the *high notes* of a piano, and meat which *smells high*.

In accordance with the conceptual metaphor MORE IS UP *high* lends itself naturally to denoting position on a numerical scale. Examples include *high number*, *high temperature*, *high price*, *high speed*, *high blood pressure*, *high pulse rate*, etc. Here, the scale is the domain for the location of an entity (a number, temperature, etc.), the zero point of the scale being the origin from which vertical distance is measured. More generally, the schema can be applied to degree or intensity, as in *high level of violence*, or sophistication and complexity, as in *high technology*, *higher education*, and *higher forms of life*. It will be observed that, for some of these domains, conceptualization in terms of verticality is so deeply engrained in our consciousness that alternative, non-orientational modes of expression are scarcely available to us. How else can we express position on a scale of price or temperature, other than with *high* and *low*?

The second conceptual metaphor, GOOD IS UP, is the basis for a large number of expressions in which *high* carries a positive evaluation: *high standards*, *high quality*, *high opinion*, *high moral values*. In other expressions, *high* denotes a positive valuation of an emotional state, as in *high hopes* and *high expectations*. Connotations of enjoyment and liveliness may be found in *high spirits*, *high life*, *high jinks*. Some metaphorical uses of *high*, e.g. *high technology*, appear to fuse the two conceptual metaphors of quantity and evaluation. *High technology* is not only high on a scale of sophistication, it is also positively valued over *low technology*. In other words, MORE is often also BETTER. A fusing

of the two metaphors may be felt in other expressions, e.g. *higher mathematics*, *higher education*, *higher forms of life*. (In *highbrow*, on the other hand, a greater than average intellect is not given a positive evaluation.) Sometimes it is difficult to classify a particular usage. In *get high on drugs*, does *high* refer to a value on a scale of brain stimulation, or does it imply a positive evaluation of a mental state, or both?

The third conceptual metaphor (POWER IS UP) maps the up–down schema on to power relations. A person or group with power is higher than those without power. Frequently, status in human society is conceptualized in terms of the up–down schema: *high society*, *high class*, *high-born*, and, of course, the expression *high status* itself. Status within a more limited domain may also be denoted by *high*, as in *high command*, *high priest*, *high position in a company*. Generally, positions of higher status are valued positively (MORE POWER is usually BETTER). This is not always the case, however. Expressions like *high-handed* and *get on one's high horse*[2] imply a negative attitude towards real or assumed power.

Metaphor, as we have seen, consists in the mapping of the logic of one domain (usually a more concrete domain) on to another (usually more abstract) domain. We need to enquire more deeply into the motivation of this transfer. What is it that permits the association of source and target domain? Why are power relations, for instance, conceptualized in terms of verticality, and not some other domain, such as left–right, front–back, or whatever? And what motivates the particular skewing of the mapping relationship? Why does the powerful end of the power scale get associated with high and the powerlessness end with low, rather than vice versa?

Traditionally, metaphor has been explained in terms of the similarity of tenor and vehicle. In their discussion of metaphor, Paivio and Begg (1981: 274) comment on the 'theoretical puzzle' of similarity. On what basis do elements in one domain come to be perceived as 'similar' to elements in another domain?

In some cases, at least, the possibility of mapping elements from one domain onto another domain is based on the fact that the two domains may co-occur within a particular area of experience, such that some elements of the one domain regularly correlate with elements of the other domain. Consider the conceptual metaphor MORE IS UP. As you add objects to a pile, the pile gets higher. This experience establishes a natural association between quantity and vertical extent. Strictly speaking, the association is one of metonymy; if one adds objects to a pile, height is literally correlated with quantity. Only when the up–down schema gets dissociated from the piling-up image and applied to more abstract instances of addition (as when one

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[2] Some metaphoric expressions, like *get on one's high horse*, are mediated by very specific visual images. *Highbrow* is another instance. For the role of images, especially in the understanding of idioms, see Lakoff (1987*b*: 451 ff.).

speaks of prices *getting higher*) does metaphor take over. The conceptual metaphors GOOD IS UP and POWER IS UP have a similar experiential basis (Lakoff and Johnson 1980). Positively evaluated human attributes like life, health, and consciousness are typically associated with an upright posture. A person who is up is one who is alive, well, and conscious, while someone who is unconscious, ill, dead, or asleep is down. Similarly, a person with the power to control, influence, or physically overcome someone else is typically of greater bodily strength, and greater bodily height, than the other person. And in the course of a physical combat the one with the greater power finishes 'up' while the victim is left, literally, 'down'. Again, the relationship between verticality and the power domain is a metonymic one. Only when the relationship is generalized beyond the stereotypical situation can one speak of metaphor.

It is tempting to see all metaphorical associations as being grounded in metonymy. (This is the reason why I suggested, at the beginning of this chapter, that metonymy might be even more basic to meaning extension than metaphor.) This view has been shared by scholars as diverse as Eco and Skinner. Eco (1979: 77) surmises that all associations are first grasped 'as contiguity internal to semantic fields', while Skinner (1957) postulated that 'verbal responses' (as they were called in the jargon of behaviourism) generalize from the stimulus to salient attributes of the stimulus, and then to entities that are contiguous to the stimulus. Thus the verbal response 'eye' would generalize to such attributes as 'recessed', 'oval', 'near top (of head)'. This particular cluster of attributes then facilitates the metaphorical extension of *eye* from "organ of sight" to "aperture of a needle".

If it were the case that metaphor were grounded, ultimately, in metonymy, we would have gone some way towards solving what Paivio and Begg called the 'theoretical puzzle' of similarity. There are, however, examples of metaphor which cannot easily be reduced to contiguity. Particularly recalcitrant are instances of a subcategory of metaphor, synaesthesia. **Synaesthesia** involves the mapping of one sensory domain on to another. Examples include *loud colour* (where an attribute of the auditory domain is mapped on to the visual domain), *soft music* (which maps a tactile sensation on to the auditory domain), and *black mood* (where colour is transferred to an emotional state). It is doubtful whether attributes of these different domains get associated through metonymy. Neither is it plausible to propose metonymy as the basis for a mapping of the vertical dimension on to sensations of pitch (*the high notes on a piano*)[3] and smell (*the meat smells high*).

Perceived similarity across different domains—of which synaesthesia is

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[3] One could argue that the correlation of high pitch with the high rate of vibration of the sound-producing body provides the metonymic basis for the conceptual metaphor. To the extent that this correlation does not form part of the world knowledge of the scientifically naïve language user, it cannot provide an experiential grounding for the metaphor.

an example—was systematically studied by Osgood and his colleagues (Osgood *et al*. 1957). Osgood postulated an abstract 'affective reaction system' which was independent of any particular sensory modality. Three primary dimensions of the affective reaction system were identified: evaluation, potency, and activity. Conceivably, similar reactions on these dimensions to stimuli from different domains could provide the experiential basis for metaphor and synaesthesia. Yet, as Paivio and Begg (1981: 276) note, 'when individuals use scales such as *fast–slow*, *hard–soft*, and *weak–strong* to rate such diverse concepts as MOTHER and DEMOCRACY, they obviously must do so in a metaphorical way'. The theoretical puzzle of similarity remains.

The discussion so far has been restricted to examples from English. However, given the conceptual basis of metaphor, and its experiential grounding in metonymy, we should expect to find substantially similar metaphorical construals in different languages and in different cultures. It would indeed be bizarre to find a language in which powerlessness is associated with 'being up', or in which time was not at all conceptualized in terms of space. But while conceptual metaphors might be shared by speakers of different languages, we should not be surprised to discover that the details of their elaboration differ from language to language. Consider, for example, the fact that in French, the motion verbs *aller* "to go" and *venir* "to come" can both be used with reference to time, *aller* with reference to the future (*Je vais lui parler* "I'm going to speak with him"), *venir* with reference to the immediate past (*Je viens de lui parler* "I've just spoken with him", literally "I come from speaking with him"). English also uses *go* with a future orientation, but the use of *come* with reference to past events is not attested. Even so, English speakers can readily appreciate the 'logic' of the French use of *venir*. This is because both French and English share the conceptual metaphor which construes the present as moving towards the future, and away from the past. This metaphor is present in English—we 'go into' the future, and we 'leave the past behind us'. Yet the specific elaboration of the metaphor, as exemplified by French *venir*, is absent from English.

I would like to conclude with another cross-language comparison, which, in this case, does point to some significant differences in the underlying conceptual metaphors. English and the Sotho languages of Southern Africa provide an interesting contrast with regard to the understanding of certain bodily and mental experiences. In English a range of emotional and physiological states, especially those involving excessive arousal, such as impatience, anger, and sexual desire, are understood in terms of heat, cf. expressions like *get hot under the collar*, *lose one's cool*, *a bitch on heat*. (Anger metaphors in English are extensively discussed in Kövecses 1986 and Lakoff 1987*b*: 380 ff.) The metaphors may well have an experiential base in the physiological changes, such as raised body temperature and increased heartbeat, which accompany states of arousal. The metaphors are thus, once again, grounded in metonymy. For speakers of the Sotho languages, on the other hand, 'being

hot' is associated with a rather different range of experiences (Hammond-Tooke 1981). Briefly, any abnormal or unpleasant condition of the body or psyche is understood in terms of being hot: bereavement, physical pain, illness (not only fever), extreme tiredness, insanity, menstruation, pregnancy, childbirth, as well as (and here the Sotho understanding coincides with English) agitation, impatience, and anger. A person in one of these conditions has 'hot blood' which needs 'cooling' (e.g. with cold water, or with cold ash from a burnt-out fire). Furthermore, the person must be kept away from family and cattle, in case he infects these with his heat. These metaphors exist not only amongst traditional speakers, but also amongst urbanized Sothos, and they show up even in their use of English (Hewson and Hamlyn 1983). The experiential base of the metaphors is no doubt to be found in the physical environment of the speakers. Traditionally, the Sothos live in a hot arid plateau, where the search for water is a major concern. It is not unreasonable to suppose that, in this environment, heat gets metonymically associated with negatively valued states (HOT IS BAD) and coolness with positively valued states (COOL IS GOOD).

It is the grounding of metaphor in experience that has made it such a central concern of the cognitive paradigm. For structuralist linguistics, language was a self-contained system of signs, independent of the cognition and experience of its users. In contrast, cognitive linguistics strongly emphasizes the non-arbitrary, motivated nature of language structure. Reference to the experiential base of metaphor thus stimulates meaningful discussion of a question that is often raised in connection with the arbitrary vs. motivated dichotomy, namely the relationship between language and culture. Since, on the one hand, certain experiences are presumably common to all normal, healthy human beings, while others are strongly conditioned by culture and environment, it comes as no surprise that we find both considerable cross-language similarity in metaphorical expression, as well as cross-language diversity. As an example of the former, one might point to the widespread correspondences in the way unrelated languages conceptualize time in terms of space (see Taylor 1987 for a comparison of English and Zulu in this respect). Diversity can be expected if different language communities draw on different experiential bases in their conceptualization of reality. Such is the case with the heat metaphors in English and Sotho.

## Study questions

1. Here are some uses of the verb *leave*. Consider how these might be related though metonymy and metaphor.

I left the room.

I left the Communist Party.
I left my briefcase in the room.
I ate the peas, but left the broccoli.
Leave me alone!
In his will, he left his property to his grandchildren.

2. The vertical dimension (high vs. low) is often invoked with reference to the distinction between the abstract (or schematic) and the concrete (or particular). Thus, you get 'down' to the facts, and 'down' to the nitty-gritty, one speaks of 'high-level' abstractions and of 'low-level' detail. Assemble further expressions which elaborate the projection of the vertical dimension on to the abstract and the concrete.

Consider also the fact that conceptual metaphors not only sanction a large number of linguistic expressions, they also influence visual representations. An example would be the way in which syntactic trees are drawn, with the most general categories positioned above more specific categories. Representations of a taxonomy, as in Fig. 3.1, also place the more abstract (schematic) category higher up than the more specific categories.

3. High and tall. As discussed in this chapter, *high* has a large number of metaphorical uses. *Tall*, on the other hand, is largely restricted to the spatial domain, and has relatively few non-spatial uses. Why do you think this should be?

4. Cool. Frequent in the speech, especially of younger English speakers, is the use of *cool* as a term of approval: *It was a cool thing to do*, *That was cool*, *He's cool*. The word can also be used as a response, with the meanings "fine", "great", and even "OK", "agreed", and "yes". Why do you think *cool* has come to function in this way as a term of approval? Study the word in relation to metaphorical conceptualizations of temperature, also in relation to the use of other temperature expressions, such as *hot*, *cold*, *warm*, *(to) chill out*. You may find it interesting to check out earlier uses of *cool* in the Oxford English Dictionary.

5. Suppose you learn that next week's meeting, scheduled for Wednesday, has been 'moved forward two days'. On what day is the meeting to take place? There are two possible answers: Monday, and Friday. Which interpretation do you prefer? What are the metaphors which underlie these two interpretations? Suppose the meeting has been 'moved back two days'. How is this interpreted? (For discussion of this problem, see Boroditsky 2000, and Boroditsky *et al.* 2002).

6. Refer to earlier remarks on the historical development of English *buff* (p. 121) and Russian *sutki* (p. 112). Discuss these examples in greater depth, making use of the theoretical concepts introduced in this chapter.

## Further reading

On metonymy, see Nunberg (1978, 1979), and Panther and Radden (1999). There are also useful discussions in Lakoff (1987*b*) and Lakoff and Johnson (1980).

The literature on metaphor is immense. Various approaches are presented in Ortony (1993). For the cognitive linguistic approach, see Lakoff and Johnson (1980, 1999), Gibbs (1994), Dirven and Pörings (2002), and Taylor (2002: ch. 24).

On image schemas, see Johnson (1987).

# Polysemy, or: How many meanings does a word *really* have?

At the beginning of Chapter 6 I defined polysemy as the 'association of two or more related senses with a single linguistic form'. A number of problems lurk behind this seemingly straightforward definition, and the apparently clear-cut phenomenon which it describes. One of these we have already touched on, namely, the question whether two different uses of a word exemplify two distinct senses, or contextual modulations of one and the same sense. Since the degree of distinctiveness of different uses is a gradient notion, the question how many senses a word has may not have a clear-cut answer. A related question concerns the knowledge that a speaker of a language needs to have in order to be able to use a word appropriately. Does the knowledge of a word's meaning take the form of a fairly general, or 'schematic' representation, with contextualized senses being derived on the basis of what the speaker takes to be conceptually plausible, in a given situation? Or could it be the case that at least some of the contextually elaborated senses are separately stored by the speaker? In this chapter, I present some arguments in favour of the latter possibility. I begin, however, with the question of compositionality, and the ways in which our treatment of polysemy impinges on our understanding of compositionality.

## **8.1.** Polysemy and compositionality

According to the **compositionality principle**, the meaning of a complex expression can be computed from the meanings of its parts and the manner of their combination. From one point of view, compositionality is not at all a remarkable phenomenon. It captures the evident truth that speakers of a language are able to create an indefinite number of innovative expressions by combining smaller units (such as words) in prescribed ways. Hearers, on the whole, are able to interpret these newly created expressions appropriately, by drawing on their knowledge of the meanings of the parts from which they are composed and the principles by which the parts are combined.

The compositionality principle is complicated, however, by the existence of polysemy. Probably, most words in a language are polysemous to some degree, that is, they have a range of distinct meanings. Compositionality therefore brings with it the problem of **sense selection**. In order to compute the meaning of a complex expression, we need to select just one of the senses of each polysemous word in the expression. In the case of words whose different meanings are not in doubt– such as *bank*, *punch*, and *port*—the matter is a straightforward one. *I live by a bank*, *I gave him a strong punch*, *we passed the port*, have different interpretations according to which sense of *bank* ("financial institution", "side of a river"), *punch* ("blow with the fist", "alcoholic drink"), and *port* ("harbour", "fortified wine") is selected.

The matter is not so clear, however, with some of the examples discussed in earlier chapters. I pointed out (Section 6.2) that *climb* refers to different kinds of activity in the following sentences:

(1)  a.  The boy climbed the tree.
     b.  The plane climbed to 30,000 feet.

In (a), *climb* designates an upward clambering motion, while in (b) it designates only an upward ascent. Now, it could be argued that the different interpretations are as much a function of the scenes which the sentences describe as of the polysemy of *climb*. Essentially, it is in virtue of our encyclopaedic knowledge that we do not associate (b) with a clambering motion. On this view, an understanding of the two sentences would not involve the selection of a particular sense of *climb*. Note, for example, that neither of the sentences is felt to be ambiguous– something which we would expect to be the case, if there was a genuine choice between two different senses of the verb.

Similar remarks apply to *over*. It could be argued that the idea of surmounting an obstacle, involving a curved upwards-downwards motion, in *jump over the fence*, is contributed by our knowledge of what fences are, in contrast to the linear crossing motion of *walk over the field*. On the other hand, the pure 'vertical' sense, without any notion of crossing, present in *The helicopter hovered over the city*, could well be a function of the meaning of

*hover*, and what we know about helicopters. We would not, for example, interpret *The boy was jumping over the fence* to mean that the boy was jumping up and down in a certain place located 'over the fence'. Such an interpretation is conceptually bizarre.

Cruse's notion of conceptual modulation, as well as Langacker's related notion of active zone, seem to be involved in the following example. Suppose someone addresses to you the request in (2):

(**2**)  Open the window.

The request seems straightforward enough, and its interpretation would not appear to raise any serious theoretical issues. Note, however, that *window* can designate several different kinds of things according to the context in which it is used. Consider the phrases in (3), where *the window* is used as the direct object of different verbs:

(**3**)  {open / paint / break / deliver / brick up / sit in / look through / jump out of} the window

As we go through each of the eight phrases in (3), we observe that *the window* designates slightly different entities in each case. In *open the window*, the expression designates the movable part of the total structure. In *break the window* (on its normal interpretation), *the window* designates a glass panel (but not the surrounding frame), in *paint the window* (again, on its normal interpretation), *the window* designates the surrounding frame (excluding the glass). To be sure, we can imagine other, less normal readings. *Break the window* could denote the breaking of the frame plus the glass, *paint the window* could denote the painting of the glass but not the frame.

A comparable situation holds for verbs, in that the kind of activity a verb designates can vary according to the kinds of nominals it combines with. Consider the kinds of activities denoted by *open* in the following:

(**4**)  open {the window / the door / a bottle of wine / a bottle of champagne / a can of beer / a can of beans / a book / a newspaper / a parcel / a pair of scissors / one's shirt / a shirt button / one's eyes / one's mouth / one's arms}

Combining *open* with the fifteen different nominals shows that the verb can designate as many different kinds of activity. Thus, when I 'open a bottle of wine' I insert a corkscrew, rotate it, and pull; when I 'open my arms', I move my arms forwards and outwards; when I 'open a pair of scissors' I cause the blades of the scissors to move apart, and so on.

If we were to recognize eight different senses of *window*, and 15 different senses of *open*, we would have to conclude that even such a simple and seemingly unremarkable sentence as *Open the window* is $8 \times 15 = 120$ ways ambiguous– an absurd result. On the other hand, by assuming that *open* and *window* have only a single sense, we are unable to compute the meaning of (2) in terms of the compositionality principle– the complex expression *Open the*

*window* has a meaning that is more specific than the compositionally derived meaning. A person intent on preserving strict compositionality might therefore be tempted to favour a polysemy analysis. On the other hand, the absence of full compositionality, as Langacker (1987: 281) has pointed out, is an all-pervasive phenomenon, and recourse to polysemy is unlikely to restore it completely. Thus, to take one of Langacker's examples, *the football under the table* (Langacker 1987: 280f.) would normally be taken to mean that the table was in its canonical standing position, with the football on the ground between its legs. To be sure, other, less normal interpretations are conceivable; for example, the table could be upside down, with the football squashed beneath it. Yet neither the 'normal' nor the 'less normal' interpretations are compositionally derivable. We should scarcely want to say that *table* is associated with a range of polysemes, each designating a different orientation of a table.

There are two principal ways to approach these issues:

(i) One approach happily allows the proliferation of the number of senses of a word, on the ground that different uses refer to different kinds of situation. It is worth mentioning that Lakoff (1987*b*: 416) takes the line that the different referential possibilities of *window* are indeed evidence for the polysemy of the word. My accounts of *climb* and *over* in Ch. 6 also proposed many different senses for the words. The approach is not without its problems. For example, if we allow the multiplication of the senses of a word, where do we stop? Since no two tokens of a word will refer to *exactly* the same situation, there will always be *some* difference between two uses of the same word. But how different do the uses have to be, in order for us to be sure that we are dealing with two distinct polysemes? Where, and on what grounds, do we draw the line between polysemy and contextual modulation? Moreover, as the number of different senses increases, the question of sense selection comes increasingly to the fore.

(ii) A second approach is to minimize polysemy, allowing greater scope to contextual interpretation. The approach seeks to bring as many different uses of a word as possible under a single common representation; senses that cannot be so treated are assigned distinct semantic entries. On this approach, the problem becomes, how to state the meaning of a word with sufficient generality so as to cover the full range of different uses (and, at the same time, with sufficient specificity so as to distinguish that word from its conceptual neighbours). With respect to (4), for example, the question arises, what *is* the meaning of *open*, abstracted away from the various expressions in which the verb is used? (The question is not at all easy to answer. Try it and see!) Proponents of general meanings are also under the obligation to account for the full usage range of an item, by spelling out how a unitary, and presumably fairly schematic meaning can come to be instantiated in a range of sometimes very different usage situations.

(There is actually a third approach, which I discuss later in this chapter, which is to claim that speakers of a language do not, in fact, first learn the meaning, or meanings, of single lexical items such as *open* and *window*, which they then combine together in phrases. Rather, what they learn are the typical collocational patterns of verbs and nouns, along with their conventionalized meanings, the meanings of the constituent parts emerging only later as patterns of similarity abstracted from the various patterns.)

It would probably be true to say that the weight of tradition (at least in theoretical semantics) favours the single meaning approach. Barring obvious cases of homonymy, the search is on for a single schematic meaning for each word and morpheme of a language. Jakobson's (1936) defence of this position will be discussed later (pp. 171–2). A recent and noteworthy implementation of the principle is Ruhl (1989). Ruhl makes a valiant attempt to bring even such an apparently multi-valued word as the verb (*to*) *bear* under a single abstract definition. On the other hand, those engaged in what one might call 'practical semantics' (for example, lexicographers) have generally had few qualms about listing large numbers of different senses. Indeed, the kinds of highly general meanings advocated by Ruhl would be quite useless in lexicography, in that the dictionary user (a foreign learner, for example) would still need information on the specific range of uses sanctioned by linguistic convention. Thus the COBUILD dictionary lists nineteen different senses of the verb *bear* (not counting phrasal expressions), with no attempt to offer a unifying definition. Even for such an apparently unproblematic verb as *open*— although on closer examination the word is by no means so unproblematic (Taylor 1992*a*)– COBUILD has no fewer than twenty-nine separate entries.

## 8.2  The two-level approach

In this and the following section, I focus on a specific approach to word meaning, and discuss some problematic aspects of it. This is the so-called 'two-level approach', associated especially with the work of Manfred Bierwisch and his associates. The two-level approach attempts to account for the wide range of specific interpretations that a word may have in different contexts, while still proposing a unitary general meaning. The aim, in other words, is to account for meaning variation without postulating polysemy. The approach is of interest, not only because it offers an alternative account of the kinds of data that have been handled in prototype accounts, but also because some of its adherents have been openly critical of prototype approaches.

The 'classic' statement (in German) of the two-level approach is Bierwisch (1983); a brief account, in English, is contained in Bierwisch (1981), whilst a more recent presentation may be found in Bierwisch and Schreuder (1992). The approach has enjoyed considerable favour, especially amongst German-speaking linguists, and has been applied mainly, though by no means

exclusively, to the study of spatial predicates, that is, prepositions and dimensional adjectives.

The term 'two-level' alludes to a proposed distinction between a linguistic-semantic level of meaning, and an essentially non-linguistic, conceptual level.[1] Exactly how this works will be illustrated in the next section. The basic idea is that the 'semantic form' of a lexical item specifies the purely linguistic meaning of the item, as stored in the mental lexicon; it is this semantic content that the item contributes to the meanings of the complex expressions in which it occurs. At the semantic level, therefore, the meaning of a complex expression is able to be computed by the compositionality principle. Semantic form is subject to conceptual interpretation, relative to conceptual knowledge, in the context of the word's use. (The approach, therefore, is firmly grounded in a modular conception of human cognition– see Section 1.4—with linguistic-semantic knowledge being essentially autonomous of conceptual knowledge.) In this way, a lexical item can come to have a range of contextually specified meanings which are not actually part of the linguistic meaning of the word. Consider the following sentence.

(**5**)  John left the University a short time ago.

This sentence has two clearly distinguishable readings. On the one, John moved away from the University premises; on the other, he severed a relation of association with the University, for example, he graduated or resigned from his teaching position. The two readings involve different readings of each constituent of the sentence. *The University* denotes either the building or the institution; *leave* denotes either movement away from a place or the severing of a relation of association; *a short time ago* invokes different time scales, i.e. 'not many hours/minutes ago' as opposed to 'not many weeks/months ago'. Even *John* has slightly different readings: a person *qua* mobile physical object versus a person *qua* student or employee. All these differences, Bierwisch maintains, are matters of conceptual interpretation, relative to a conceptual domain (location versus institutional affiliation), of what is claimed to be a unitary semantic representation.[2]

A central claim of the two-level approach, therefore, is that much of what passes as polysemy, or meaning variation (as treated, for example, in prototype

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[1] In addition to the conceptual and the linguistic-semantic levels, Bierwisch (1983: 65) proposes a level of interactional meaning. Consider the sentence in (i).

(i)    This is the University.

The fact that *the University* might be taken to refer to the building rather than to the institution, is, for Bierwisch, a matter of conceptual interpretation of a unitary semantic meaning; that (i) could be used as a request for payment (if spoken, for example, by a taxi driver, on arrival at the passenger's destination) is a matter of interactional interpretation of a conceptual meaning. Strictly speaking, therefore, we ought to be talking of the 'three-level' approach to meaning, the three levels being the semantic, the conceptual, and the interactional.

[2] For an account of these kinds of effects within an encyclopaedist semantics, see Croft (1993).

accounts, or as reflected in, say, the COBUILD dictionary), is not in fact a linguistic-semantic phenomenon at all, but reflects alternative conceptual interpretations, relative to context, of unitary semantic representations. As I have already said, adherents of the two-level approach have been explicitly critical of the prototype approach. The substance of the criticism[3] appears to be that prototype theory fails to constrain, in a principled way, the range of possible senses that a lexical item may have; that, consequently, prototype accounts tend to be purely descriptive, rather than explanatory, in that they merely list the various senses, rather than deriving them from general principles; also that the meanings postulated by prototype theorists are unnecessarily rich in detail, in that they contain all manner of conceptual information which, it is claimed, is supplied only in the process of interpretation in context and which therefore does not belong to the linguistic meaning of a word. In contrast to what Herweg (1988: 106) calls the 'polysemy inflation' promoted by prototype theorists, the two-level approach seeks linguistic-semantic representations which are of maximum generality and economy, leaving to conceptual interpretation the kinds of meaning variation which words generally exhibit in their usage contexts. Thus both Bierwisch (1983: 76) and Wunderlich (1991: 593) subscribe to the 'methodological principle' that one should try to bring as many different senses of a lexical item as possible under a single semantic entry.

One scholar whose approach to meaning variation turns out to be very similar to that of Bierwisch is John Searle. Searle (1983: 145 ff.) pointed out that different uses of the verb *open* (*open the door*, *open the book*, *open the wound*, and so on– note that all of these constitute 'literal', that is, non-metaphorical uses of the word) denote different kinds of activities, and determine different sets of truth conditions. A person who proceeds to 'open the door' in the way in which a surgeon would 'open a wound', that is, by making incisions in it with a scalpel, could not be said to have 'opened the door'. Searle (1980) argued much the same point on the example of the verb *cut*, observing that you do not 'cut the cake' in the same way as you 'cut the grass', namely, by running the lawnmower over it. Yet Searle is reluctant to conclude that *open* (or *cut*) is polysemous. Such a move could end up with our having to recognize as many different senses of *open* as there are kinds of things that may be opened; since the number of things that may be opened is indefinite, we could end up by having to say that *open* is indefinitely polysemous, and indefinite polysemy is something that Searle (1983: 146) finds 'absurd'. On the contrary, Searle insists that *open* has but a single sense, and that the word makes exactly the same semantic contribution to each expression in which it occurs. Searle squares this position with the phenomenon of meaning variation by appeal to what he calls 'the Background of meaning'. The Background comprises those beliefs, practices, and assumptions that make it

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[3]  See, for example, Herweg (1988: 53–8, 1989: 104–6), Lang (1991: 145 f.), Wunderlich (1993: 132).

possible for a person to interact with the world. Linguistic expressions do not normally designate aspects of the Background; rather, expressions are *interpreted* relative to the Background. In the case of *open*, the different truth conditions for various uses of the verb come about when expressions are interpreted against background knowledge of different practices. To illustrate the point, Searle (1983: 147) cites the expression *Sam opened the Sun*. We are able to fully *understand* this expression, Searle maintains, on the basis of our knowledge of the linguistic-semantic meaning of *open* (and of other elements in the sentence). But we can have no idea at all of what Sam actually *did*, hence we can have no way of verifying the truth of a statement that he 'opened the Sun'. This is because we have no background knowledge of the practice of 'opening the Sun', against which to interpret the expression.

Searle is actually quite vague as to the mechanics of sentence interpretation. Also, in spite of his insistence that *open* has a unitary semantic meaning, he fails to state what this unitary meaning might be. A major achievement of the two-level theorists has been to make explicit proposals in this regard, for a certain range of data, at least. It is to this issue that we turn in the next section.

## 8.3. Two illustrations: *in* and *round*

The two-level theorists assume semantic representations which decompose a word's meaning into predicate–argument format. The representations contain semantic primitives whose actual value may be determined only at the conceptual level. The semantic entry thereby specifies 'conditions for the identification of conceptual elements' (Lang 1991: 146). By way of illustration, I would like to consider some two-level accounts of prepositions. I begin with a fairly simple case, which is not, however, without its interest. The following exemplify some uses of the preposition *in*.

(6) a. the water in the vase
    b. the crack in the vase
    c. the flowers in the vase

(7) a. the coin in my hand
    b. the splinter in my hand
    c. the umbrella in my hand

Taking these on their normal interpretations, it is apparent that the (a), (b), and (c) expressions denote three different kinds of spatial arrangement. In (a), the one object, the trajector (TR), is (wholly) located within a hollow internal region defined by the exterior sides of the landmark (LM) object; in (b), the TR is located within the material substance of the LM object; while in (c) the TR is supported, or held in position, by partial containment within the LM.

In spite of these differences, Herweg (1988)– from whom the examples have been adapted– insists that the three uses of *in* exemplify the very same

semantic sense of the preposition. In common with other two-level theorists, he takes (8) as the general format for the semantics of a spatial preposition.

(8)  λy λx[LOC[x, REG[y]] . . . ]

Roughly: *x* is located in the region of *y*. ('. . .' in (8) allows for the possibility of some further conditions.) The different prepositions impose different conditions on the specification of REG[y]. For *in*, Herweg proposes (9).

(9)  λy λx [LOC [x, PLACE [y]]]

That is, *x* is located in a region characterized as the space occupied by *y*.

   Observe that this formula states purely geometrical conditions for the 'in'-relation; there is no hint of 'functional' or 'experiential' aspects, such as containment, holding, or support. The formula also says nothing about the topological properties of the space occupied by *y*, for example, whether the space is the hollow internal region of a container-like object, or whether it is the space occupied by the material substance of an object. These aspects are specified only in the process of conceptual interpretation of the semantic primitives LOC (= Location) and PLACE, by reference to conceptual knowledge of the entities that instantiate the variables *x* and *y*, and of the kinds of relation that may normally hold between these entities. Thus, given conceptual knowledge of what a crack is, *the crack in the vase* (6b) comes to have a different reading from *the water in the vase* (6a). The account certainly captures the intuition that the special reading of (6b) may be due as much to the semantics of *crack* as to the semantics of *in*. Consider also, in this light, the contrast between *the coin in my hand* (7a) and *the splinter in my hand* (7b). The contrast appears to be due, in part, to the fact that a 'hand' may be conceptualized in slightly different ways, as a flexible object that can be cupped around a smaller object, or as an object whose material substance can be penetrated. Even so, it is not impossible to imagine that the coin is lodged inside the flesh of my hand, nor that the splinter is held in the hollow of my hand. It was with these effects in mind that I introduced the examples in (6) and (7) by referring to the 'normal interpretations' of the expressions. Adherents of the two-level approach would claim that the 'normality' of an interpretation reflects purely conceptual aspects, not the semantic meanings of the constituent expressions.

   Somewhat problematic, for the two-level approach, are the (c) examples. In terms of the formula in (9), the TR entity has to be totally included within the LM entity. Clearly, an umbrella can be 'in my hand' without it being the case that the umbrella is totally included within the space defined by 'my hand'. One possibility might be to appeal to some notion of 'pragmatic tolerance', which permits some deviation from the strict requirement of total inclusion. For Wunderlich (1993: 125), 'pragmatic tolerance' smacks too much of proto-type theory; appeal to such an 'unrestricted' notion, in order to 'explain every-thing we are not able to explain otherwise', would be methodologically

'bad'. Moreover, this kind of pragmatic tolerance would conflict with what is claimed to be 'a quite general semantic requirement', namely, the 'homogeneity presupposition of predication' (10).

(**10**) Homogeneity presupposition: If we predicate P of $x$ we assume $x$ to be homogeneous with respect to P. (Wunderlich 1993: 125)

Thus, a statement to the effect that $x$ is 'in $y$' entails that all of $x$ is in $y$. *The chickens are in the yard* is true, only if all the chickens are in the yard. Likewise, *My car is in the garage* is true, only if my car is completely in the garage. If the homogeneity requirement is not met, we need some kind of quantifying expression, such as *most*, *some*, *partly*, and the like. However, the use of quantifying expressions with the kinds of situations denoted by (6c) and (7c) does not result in more fully specified descriptions of the situations. Rather, we get descriptions of other kinds of situations, or expressions which are simply anomalous. *The flowers are partly in the vase* does not mean that only part of each flower is 'in the vase', it means that some of the flowers are in the vase, the others are not in the vase. And *The umbrella is partly in my hand* is simply bizarre. Wunderlich therefore concludes that the homogeneity principle is not being violated in the (c) expressions.

Still, the fact remains that in (6c) not all of each flower is in the vase, and that in (7c) not all of the umbrella is in my hand. To explain these facts— which some might want to take as a good indication that the (c) uses do exemplify a sense of *in* which is distinct from that of the (a) and (b) uses— Wunderlich (1993: 124 f.), developing the discussion in Herweg (1989), appeals to a 'conceptual focusing strategy'. He points out that the special notion of 'holding', or 'support', is brought to bear on the interpretation. This notion is not present in the semantic form (the semantic form contains only geometrical notions, not functional or experiential notions), it is supplied only in the process of conceptual interpretation. Given that a holding or support relation is involved in the (c) examples, we conceptually focus only on that part of the TR entity that is involved in the relation. It is this part of the TR that is (completely) 'in' the LM. In this way, the semantic condition of interiority 'is satisfied literally' (Wunderlich 1993: 125).

The affinity of Wunderlich's notion of 'conceptual focusing' with the Langackerian notion of the 'active zone' will be obvious. (A crucial difference, though, is that for Wunderlich, 'focusing' is a purely conceptual, that is, a non-linguistic, non-semantic phenomenon, whereas for Langacker, active zone phenomena 'go right to heart of critical grammatical issues'.)[4] On a more polemical note, one might ask why Wunderlich should regard the strategy of

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[4] Langacker (1991: 189). Thus, Langacker applies the notion of active zone to such a quintessentially grammatical phenomenon as so-called 'object-to-subject raising', exemplified by *Wombats are easy to wash*.

conceptual focusing to be exempt from the kind of criticism that he had levelled at the notion of deviation from a prototype. Given the status of the homogeneity presupposition principle (10) as a strict condition on semantic representations, the focusing strategy (or some similar device) will need to be invoked rather often. Consider (11):

(11) a.  My new car got dented in the accident.
     b.  Johnny fell and cut himself.

According to the homogeneity principle, (11a) would be true only if the total surface of my car ended up dented. But (11a) could be asserted even if only a tiny dent had been made in some obscure part of the bodywork. Likewise, for (11b) to be true, it is not necessary for the whole of Johnny's body to be lacerated; a tiny cut on the elbow would suffice. Neither does quantification appear to be indicated in such circumstances. *Johnny fell and partly cut himself* is just bizarre. (Rather, the 'active zone' is likely to be spelled out in a prepositional adjunct: *He cut himself on the elbow*.) Cases like these are probably the norm, not the exception. Wunderlich, as we have seen, is sceptical of the notion of deviation from a prototype, partly on the grounds that we have no principled way of predicting which deviations will be tolerated, also because of the desire to preserve intact the homogeneity principle and the strict satisfaction of semantic conditions; allowing prototypes and deviations therefrom 'would undermine our whole endeavor for a combined semantic and conceptual approach' (p. 125). But, equally, given the ubiquity and diversity of focusing effects, one wonders why these effects, which seem to be no less 'unrestricted' in their operation than 'deviations from prototypes', should not also, in the long run, undermine the two-level endeavour.

Be that as it may, the device of conceptual focusing plays a crucial role in Wunderlich's (1993) account of the German preposition *um* "(a)round". In this case, we have available, for comparison, a prototype account of the English equivalent of *um* (Schulze 1991, 1993). It should be pointed out that the usage range of German *um* does not exactly coincide with that of English (*a*)*round*, a point we return to later. On the other hand, the German examples that Wunderlich discusses do have English equivalents with (*a*)*round*, and to this extent we may be justified in applying Wunderlich's account to the English preposition.

On the face of it, (*a*)*round* presents the two-level theorist (and indeed anyone intent on deriving the various uses of the word from a unique definition) with a considerable challenge. Consider the following sentence with *round*.

(12)  The boy ran round the playing field.

There are at least three markedly different interpretations of this sentence. These are illustrated diagrammatically in (a)–(c) of Fig. 8.1. In both (a) and (b) of Fig. 8.1, the TR, i.e. the boy, moves along a path whose general shape follows the boundary of the LM entity, i.e. the playing field. The difference

**Fig. 8.1.** Some meanings of *round*.
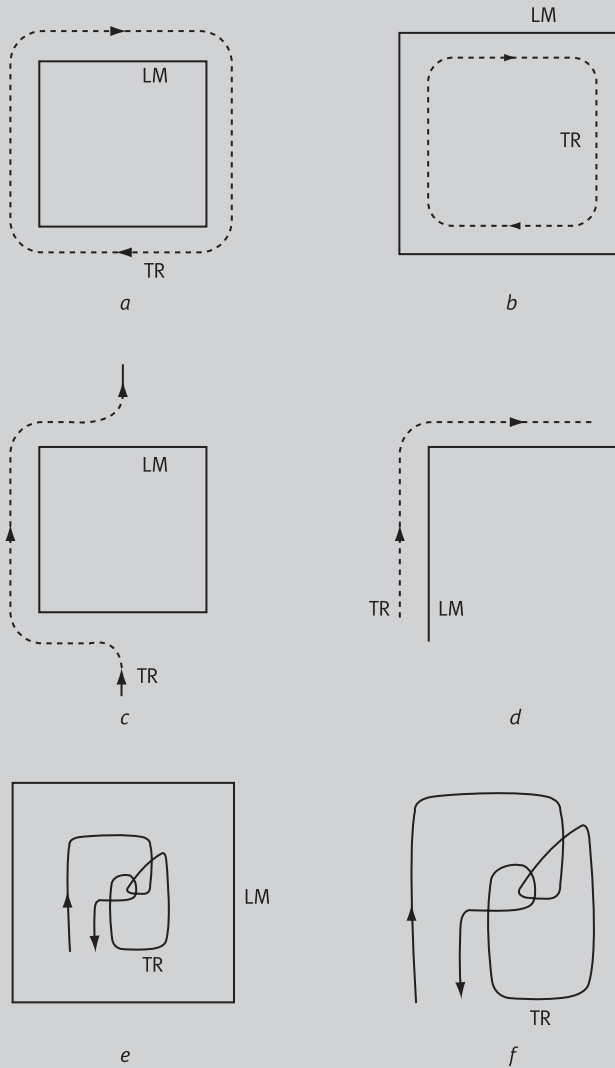


is that in (a) the path is external to the LM's boundary, whereas in (b) it is internal to the boundary. The third reading, (c), is similar to (a), in that the path is external to the LM. An extra component is that the LM is presented as an obstacle on the TR's path from some unspecified origin to some unspecified destination, whereby the TR makes a detour, circumventing the

LM. In this case, the path 'round' the playing field does not completely enclose it; in all probability, it goes only about 'half way round'. But even in (a) and (b) it is not clear whether the boy ran 'all the way round' the field, or only 'part of the way round', or even whether he went round several times. There could be grounds, therefore, for claiming that the notion of complete as opposed to partial enclosure is not actually intrinsic to the meaning of *round*, but is induced by contextual factors.

In this connection, note that the choice between readings (a) and (b) may be closely bound up with the lexical context in which *round* occurs. Compare:

(**13**)  a.  The boy ran round the lake.
     b.  The boy sailed round the lake.

(**14**)  a.  The boy sailed round the island.
     b.  The boy ran round the island.

Given what we know about lakes and islands, and about running and sailing, it is obvious that the (a) sentences can only be interpreted according to diagram (a) in Fig. 8.1, whereas the (b) sentences can only be interpreted according to (b).

The issue of complete or partial encirclement may also be settled, in some instances, by the nature of the LM entity. One interpretation of (15a) is that the boy went full circle round the block, finishing at the place where he started. In (15b), however, the TR's path goes through only approximately 90 degrees. This reading– sketched in (d) of Fig. 8.1—seems to be dependent on the fact that the LM object, *the corner*, denotes a part of a larger entity and thus cannot, of itself, be fully surrounded.

(**15**)  a.  The boy ran round the block.
     b.  The boy ran round the corner.

There are many other uses of *round* in English, but let us pause here. The question is how to handle these different uses. One approach might be to recognize a particular usage variant– (a) of Fig. 8.1, for example– as 'basic', or prototypical, and to see the other uses as extensions from it. (On this approach, the other uses are not simply 'pragmatically tolerated deviations' from the prototype, they constitute independent, established senses of the word.) Another approach might be to identify what is common to the various uses, and to propose this as the general meaning of *round*. One possibility that I have hinted at could be to say that the path of the TR roughly follows the (non-rectilinear) boundary of the LM. (Still, the postulation of a general meaning of this nature does not remove the need for specifying the conventionalized instantiations of this meaning; it is, I would maintain, a *particular fact* about English *round*, and German *um*, that the words may denote the specific configurations in (a)–(d) of Fig. 8.1.) Wunderlich's solution is different. He proposes a semantic representation (16) that appears to

correspond rather closely to (a) of Fig. 8.1, but which is claimed, nevertheless, to be subject to general processes of conceptual interpretation, giving rise to the configurations sketched in (a)–(d).

(**16**)    *um* "(a)round"
        λy λx [LOC[*x*, EXT[*y*]] & ENCL[D[*x*],*y*]]

Roughly, *x* is located in the proximal exterior of *y*, and D[*x*], the dimensional extension of *x*, encloses *y*.

This semantic formula requires that the TR be external to the LM, and that it completely encloses it. Apparent violations may be due, in the case of partial enclosure (15b), to special properties of the LM entity. For an entity such as a corner, the exterior region EXT[*y*] only partially surrounds the entity. For the circumventing sense (d), the device of conceptual focusing is called upon. Given a conceptual focus on the route that the TR takes in getting from some place of origin to some intended destination, only a half-plane of the LM object is under observation. Within this focused region, D[*x*] has the ideal gestalt of a semicircle. Hence, Wunderlich asserts, the semantic conditions of the preposition are strictly observed; 'nothing must be changed in the semantic condition . . . to arrive at the desired result' (i.e. the strict observation of semantic conditions).

The case of interiority, as in (b) of Fig. 8.1, Wunderlich also derives through conceptual focusing. On the face of it, sense (b) clearly conflicts with the semantic condition of exteriority contained in (16). Wunderlich's solution is to claim that certain entities, such as ponds and lakes, can be conceptualized in two different ways. Looking at them from the outside, they constitute 'closed regions', with a clearly marked external boundary; in the case of a lake, this external boundary would be the shore. If you 'run round' a lake, your path is external to this boundary. On an alternative conceptualization, the 'lake proper' is the central, deep part of the lake; the lake becomes an 'open region', whose rather vaguely demarcated boundary is the shallow water surrounding the deep central area. While wading or swimming in the shallow border region, you could still refer to the central region as 'the lake', and conclude that it might be dangerous for you to swim across it. By the same token, 'swimming round the lake' involves conceptual focusing on the central portion of the lake, and your path is strictly external to this central area.

The idea is not as far-fetched as it might at first sight appear. One piece of evidence (not cited by Wunderlich) concerns the use of *into*. Normally, to 'go into' a region means to cross an external boundary. If you 'walk into' the room, your path begins outside the room and terminates inside it. But *into* can also be used to denote motion towards the centre.

(**17**)  We drove deeper into the forest.

This sentence does not entail that our journey began outside the forest. It could be that we started our journey somewhere on the periphery of the forest (but still at a place which is 'in' the forest), and proceeded towards the central region. One might therefore argue that (17) conceptually focuses on the dense internal region of the forest as the 'forest proper', which is bounded by the peripheral and less dense region. What is crossed, in (17), is the rather vaguely demarcated boundary between the peripheral and the central region.

So far, then, so good. The snag is, German *um*, and English *round*, have uses which cannot plausibly be brought under the semantic representation in (16). Wunderlich (1993: 131) cites the use of the verb particle *um* in (18b), which contrasts with the preposition *um* in (18a).

(**18**)  a.  Sie fuhr um die Absperrung.
            "She drove round the barrier"
        b.  Sie fuhr die Absperrung um.
            "She drove over the barrier", i.e. "She drove over the barrier, knocking it down"

Particle *um* denotes, according to Wunderlich, 'some change in position'. He notes (p. 132) that the syntactic and semantic differences between particle *um* and prepositional *um* are so great, that it would be impossible to derive both from a 'common, even more abstract semantic source'. Consequently, particle *um* has to be regarded as a separate lexical item from prepositional *um*; *um* thus turns out to be homonymous, associated with two quite unrelated semantic entries.

I will not go into the question of whether the meaning of particle *um* may not in fact be related to that of prepositional *um*. The situation is probably not too dissimilar to that of English *over*, discussed in Section 6.3. There, we traced a chain of meanings which related the spatial preposition, as in *fly over the city*, to the change in position sense of the particle/adverbial, exemplified in *turn over the stone* (as well as, of course, in *drive over the barrier*).

The case of English *round*, however, seems quite clear. Consider the following use of the preposition:

(**19**)  We spent half an hour driving round the city centre, trying to find a parking place.

On its normal interpretation, (19) does not mean that our path followed the boundary of the city centre, whether external to the boundary or internal to it, but rather that our path had a random, convoluted shape, criss-crossing the area of the inner city. This use is illustrated in (e) of Fig. 8.1. There is a certain affinity between (e) and (b), in that in both cases the path is confined within the boundary of the LM. There is, though, virtually no affinity at all between (e) and (a), apart from the notion of the bounded LM entity. Even this aspect

may disappear. In (20), illustrated in (f) of Fig. 8.1, all that is at issue is the random, convoluted nature of the path; the enclosing space is not specified.[5]

(**20**) We spent half an hour driving round, trying to find a parking place.

Some further extensions might be briefly mentioned. Consider (21):

(**21**) a. There were people standing round the room, talking.
     b. There were people standing round, talking.

These exemplify positional variants of the meanings exemplified in (19) and (20). Whereas in (19) the TR moves along a random path within a bounded region, in the positional variant (21a) a multiplex TR is randomly distributed within a bounded region, while in (21b) it is only random distribution, within an unspecified region, that is at issue.

Senses (e) and (f) of Fig. 8.1 are not shared with German *um*; these would be expressed, in German, not by the simple preposition *um*, but by *herum*, or even *um herum*. Thus, (20) might be rendered as *Wir sind eine halbe Stunde im Zentrum herumgefahren, auf der Suche nach einem Parkplatz*. A direct application of Wunderlich's analysis to the English preposition is therefore not entirely legitimate. Still, looking at the English data in the spirit of the two-level approach, we may ask whether it might be possible to derive variants (e) and (f) from a unique semantic representation like that in (16). For myself, I see no way in which this could be managed, even with a liberal dose of conceptual focusing. One solution could be to take our cue from Wunderlich, and recognize two homonyms, *round*[1], with readings (a)–(d), and *round*[2], with readings (e) and (f). This, however, would ignore the obvious affinity between (b) and (e), both of which involve a non-rectilinear path within a bounded region. The English data, it seems to me, clearly demand a radial category, or family resemblance account, of the kind proposed by Schulze (1991; 1993), on whose work the drawings in Fig. 8.1 are based.

## 8.4 Polysemy and the network model

An evaluation of the two-level approach involves several issues. One of these concerns the proposed distinction between a level of linguistic-semantic meaning and a level of non-linguistic, conceptual meaning. Independent of the semantic–conceptual split is the issue of the legitimacy, in principle, of abstract schematic representations of word meanings, and the relevance of these to a person's knowledge of a language.

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[5] Traditionally, *round* in (20) would be described as a particle or an adverbial, not as a preposition. Jackendoff (1973) advanced a number of reasons why certain adverbials, particles, and even conjunctions should be assimilated to the category of preposition. Thus, we could say that (20) exemplifies an 'intransitive' use of the preposition– intransitive, since its complement remains unexpressed. Jackendoff's arguments had been prefigured by Jespersen (1924: 87 ff.).

On the first issue, it should be borne in mind that the two-level approach is by no means unique in proposing a bifurcation of meaning into a purely linguistic component and a non-linguistic, or encyclopaedic, component. On the contrary, the bifurcation is a common thread running through much semantic theorizing of the last couple of decades. The distinction is fundamental to Montague grammar,[6] it turns up in Jackendoff's recent work,[7] Sperber and Wilson's (1986) relevance theory is predicated upon it, Searle (1980 and 1983) appealed to it in his analysis of *cut* and *open*, as did Katz and Postal (1964) with their distinction between semantic markers, which are responsible for systematic contrasts in a language, and distinguishers, which capture the idiosyncratic residue (see Chapter 2, p. 31). Indeed, the very postulate of an autonomous language faculty (see Section 1.4) entails the distinctness of linguistic knowledge *vis-à-vis* conceptual and encyclopaedic knowledge. Equally, a number of linguists, of various theoretical persuasions, have been highly sceptical of the very basis of the linguistic–conceptual bifurcation. Critics have included Bolinger (1965), Sampson (1980*a*), Haiman (1980), Geeraerts (1985*b*), Langacker (1987), and many others. In fact, the thesis that meaning is inherently and essentially encyclopaedic in scope has become a kind of hallmark of the cognitive linguistic approach advocated in this book.

The second issue– the legitimacy, in principle, of highly schematic representations of word meanings– is perhaps less controversial. I imagine that a good many linguists– including many of those who subscribe to an encyclopaedist semantics– might well endorse the 'methodological principle' of trying to cover as many uses as possible by a unique semantic representation. Even Langacker might not be entirely unsympathetic. Whilst Langacker (1991: 194) takes it for granted that polysemy is 'the normal state of affairs' in lexical semantics, he has also devoted considerable attention to the search for maximally general characterizations of such things as the semantic import of word classes (alluded to in Section 11.3), the meaning of the possessive morpheme in English (Langacker 1991: 172), and a general characterization of that most elusive of the English prepositions, *of* (Langacker 1992).

There can therefore be no quarrel in principle with the idea of general

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[6] Thomason (1974), in his introduction to a collection of Montague's papers, insisted that semantic theory should be clearly demarcated from lexicography. The proper object of semantic theory, Thomason asserts, is the different kinds of meanings that attach to different syntactic categories; semantics is not at all concerned with 'an account of how any two expressions belonging to the same syntactic category differ in meaning' (p. 48). The difference in meaning between the verbs *run* and *walk* would therefore not be a semantic issue, but the concern of the lexicographer, who, unlike the semanticist, may freely appeal to 'concepts from all areas of knowledge and practice' (p. 49).

[7] See Taylor (1996*a*) for the role of the semantic/encyclopaedic bifurcation with special reference to Jackendoff (1990).

characterizations of words such as *in* and *round*, which propose to capture what is common to many different uses of the words. (This said, I doubt, in the case of *round*, whether all uses could be subsumed under a single entry; and, as already pointed out, the general characterizations will in any event need to be supplemented by information on the range of accepted and language-specific instantiations of the general meanings.) A general notion of containment, say, for *in*, or a general notion of encirclement for (some uses of) *round*, are unobjectionable. But I see no reason why these general characterizations should be any less 'conceptual' in content (as the two-level theorists would have it) than the more specific readings; it is just that the general meanings lack the detail associated with the more specific meanings. The more abstract senses are therefore not ontologically distinct from the specific senses; they are still understood in experiential, imagistic terms, just like the specific readings, rather than in terms of a disembodied logic of space.

Over and above the legitimacy, in principle, of general as opposed to specific semantic statements, there is an empirical question. This concerns the level of abstraction at which word meanings actually are stored in the mind of a speaker, and the level at which speakers actually do access word meanings in the process of producing and understanding language.

It is commonly agreed that a word may typically be used in a variety of contexts, to denote a range of different kinds of situation. It does not follow that each of these different contextual variants is separately stored in the mind of the speaker/hearer; it could be that a person accesses a rather more abstract representation, and derives contextual variants by some general processes of conceptual elaboration, possibly along the lines suggested by the two-level theorists.

On the other hand, the fact that an ingenious linguist may be able to come up with a maximally general semantic statement which covers a wide range of different uses does not entail that speakers of a language do store the word meaning in the abstract format, and that they do implement a process of conceptual elaboration, on each occasion of the word's use. It could be that at least some of the variants are mentally stored and can be directly accessed in the production and comprehension of language.

Neither do we have to regard the two perspectives as mutually exclusive. It is perfectly plausible that a speaker can store both a range of specific uses of a word, and a more abstract representation that captures what is common to the more specific uses. Indeed, there seems no a priori reason why a speaker should not store a number of representations of varying degrees of abstraction.

Methodological objections might be raised against such a proposal. If different uses of a word *can* be covered by a single semantic entry, why clutter up the grammar with a list of specific and more or less predictable instantiations of the general entry? Surely, the very essence of linguistic enquiry (as we tell our first-year students) is, precisely, the formulation of

general statements, not the listing of specific instances covered by the general statements.[8]

Yet there is considerable circumstantial evidence that speakers of a language do associate words with a range of rather specific readings. To the extent that a linguist's description of a language is meant to model the native speaker's acquired knowledge of the language– to the extent, that is, that a linguist's grammar is supposed to be 'psychologically real'– it will need to take account of this evidence. A major weakness of the two-level approach, it seems to me, is that it denies in principle the possibility of stable mental representations of specific meanings. To allow that more specific readings (such as the 'circumvent-a-hindrance' sense of *round*) are separately stored in the mental lexicon would threaten the very architecture of the two-level model.

(a) There are, first of all, the well-known and well-documented prototype effects. If a person is asked to come up with sentences exemplifying a target word, then, with remarkable consistency, certain uses will be cited earlier, and more frequently, than others. I have already mentioned (p. 119) the results of a small investigation with *over*. Similar tests with *round* consistently elicited instances of sense (a) in Fig. 8.1, of the kind *The Earth goes round the Sun*. These results suggest that certain readings of a word have a privileged status in the mental lexicon and can be accessed more easily than others. Such a possibility is incompatible with the assumption that each reading of a word is generated from a unique representation.

(b) Speakers of a language are generally hard put to state the general meaning of a word, the more so if the word is one in common use. A person has no problems at all to explain what *open the door* means. But ask someone for the general meaning of *open*, abstracted away from various uses of the verb (*open the door*, *open the office*, *open a newspaper, open a parcel*, *open a penknife*, *open a zip*), and they find the task embarrassingly difficult. It might be premature to conclude from this that the mental lexicon contains only the specific readings of the word, to the exclusion of a general characterization. The generative paradigm (of which the two-level model is an offshoot) accepts that people may not have conscious access to the rules and representations which underlie their linguistic performance. Still, it seems rather perverse to insist that speakers and hearers, in their everyday use of language, *do not* access specific senses that are readily available to introspection, and that they *do* access an abstract sense that is hardly available at all to introspection.

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[8] Langacker (1987: 29) discusses these issues in terms of what he calls the 'rule/list fallacy'. This is 'the assumption, on grounds of simplicity, that particular statements (i.e. lists) must be excised from the grammar of a language if general statements (i.e. rules) that subsume them can be established'. But, he adds, 'for anyone taking seriously the goal of "psychological reality"' , the simplicity thereby achieved is 'specious'.

(c) Speakers of a language are able to give quite reliable judgements of degrees of similarity between the different senses of a word. This is true not only of words such as *body*, whose different meanings ("physical being", "main part") are markedly dissimilar (Durkin and Manning 1989), but also for the more closely related meanings of a preposition such as *round*. Schulze (1991) reports a number of experiments investigating similarity judgements pertaining to twenty different uses of (*a*)*round*. These judgements were subjected to the statistical procedure of hierarchical cluster analysis. The clusters that emerged can plausibly be taken as indications of the salience, at varying levels of abstraction, of different senses of the preposition. Of special interest is the emergence of clusters that appear to correspond, rather closely, to the distinct senses sketched in Fig. 8.1. One such cluster corresponds to the 'circumvent-a-hindrance' sense of *round*; this sense, then, appears to be more than just a 'conceptual variant', induced by a context-specific focusing strategy. Moreover, inspection of Schulze's results lends little support to the thesis, which we briefly entertained as one which the two-level approach might favour, that *round* might be homonymous; the 'random path/location within a bounded area' sense does *not* emerge as totally unrelated to the other uses of *round*.

These findings are just what we should expect, given the assumption that different readings of *round* are structured in a radial category. But the findings are quite inexplicable on the assumption that the mental lexicon contains only the most abstract representation, and that *all* senses of a word derive equally, by a process of conceptual interpretation, from this abstract representation.

(d) Processes of metaphorical extension typically apply to a rather specific sense of a word, not to the most general. *The boy got round his mother*, in the sense "the boy got his mother to let him have his own way", invokes the 'image schema' of a journey, and conceptualizes a person's actions as a path, and circumstances that frustrate the achievement of an intended goal as obstacles on the path. The metaphor is sanctioned by the specific 'circumvent-a-hindrance' sense of *round*, not by the general encirclement sense. The very existence of the metaphor, and the fact that it is so readily understood along the lines suggested, suggests that speakers have access to a stable mental representation of this specific sense of *round*.

(e) Important also is the evidence of semantic change. Semantic change typically involves a shift in the relative frequency and relative salience of different readings. What might start out as a one-off, context-dependent extension acquires, through time, and with repeated use, the status of an established sense, perhaps even the prototypical sense, whereby the original sense(s) may get pushed to the periphery, and eventually fall into disuse. Geeraerts (1985a) documents just such a process. The process presupposes that speakers can keep track of the different readings of a word with respect to their frequency and centrality. This, as Geeraerts (1993) has also

pointed out, in turn presupposes that speakers have access to stable mental representations of these specific readings.

(f) Even assuming that speakers do store highly abstract representations of the words of their language, we need to ask how a language learner could acquire these abstractions in the first place. Words– it seems safe to say– are learned on examples of their use. It seems rather implausible that the child language learner (or an adult learner, for that matter– for it is not just pre-school children who learn new words, adults do so too), after having encountered a new word for the first time, will instantaneously construct a highly abstract sense. On the contrary, the initial representation, we may suppose, will be rather specific, and rich in contextual detail. Acquisition then proceeds both *horizontally* (new uses are associated through similarity with already familiar uses) and *vertically* (as different uses become familiar, a more schematic representation may be abstracted, which captures the commonality of known uses, and which also sanctions a range of new usage possibilities). There is no reason to suppose, however, that as more schematic representations emerge, the more specific representations on which they are based will necessarily be erased.

Just this possibility is foreseen by Langacker's **network model** of category structure (Langacker 1988). The model was introduced in Section 4.2, on the example of the word *tree*. According to the model, the established senses of a word constitute the nodes of a possibly complex extended network. The senses are linked, horizontally by relations of similarity, and vertically by the relation of a schema and its instantiations. The nuclear structure of the network is depicted in Fig. 8.2. Sense [B] is an extension of sense [A], that is, [B] is perceived to be similar, in some respects, to [A]; sense [C] is schematic for both [A] and [B], that is, it captures, at a level which abstracts away from the specific differences between [A] and [B], the commonality between them. We can imagine that the lowest nodes of a network might comprise specific colloca-tions (and their conventionalized meanings) of a lexical item, which may be accessed as preformed chunks; but the possibility of more abstract representa-tions, perhaps even of a 'superschema', which covers the full range of particu-lar uses of an item, is not denied. What the network model does deny is that the most abstract representation is always and necessarily invoked in the understanding of contextual variants.

Consider what it means for a person to know the meaning of a word. Take Searle's example of the verb *open*. A person encounters the word in a wide range of contexts. Some of these may be perceived to be similar in some respects. *Open the room*, *open a parcel*, *open an envelope*, all have the idea of gaining access to the interior of a closed container. Other uses focus on the manner in which access is gained, namely by manœuvring some device in order to create an aperture: *open the door*, *open the lid*, *open the cork*. Yet again, other uses focus on the moving apart of the component parts of an

**Fig. 8.2.** The network structure.
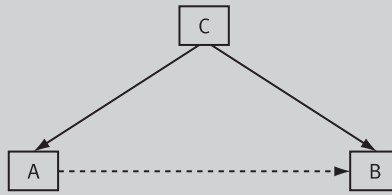


entity: *open one's shirt*, *open a zip*, *open a penknife*. Other uses have to do with making something accessible, for example to the general public: *open an exhibition*, *open a nature reserve*, *open a road*; others, yet again, have to do with the initiation of an interactional process: *open a discussion*, *open a debate*, *open a conference*. These are all conventionalized uses of the verb. It will be noted, moreover, that they all involve interaction with **basic level objects**; the events themselves may well have the status of **basic level events** (see p. 51).

Any adult speaker of English will surely be familiar with these expressions with *open*, and will have learned the kinds of situation to which they may be applied. Together, they form a coherent category not so much because of some overarching common element which they each instantiate, but through criss-crossing networks of similarities, at various levels of generality (see Fig. 8.3 overleaf). The category, it also needs to be stressed, is very likely peculiar to English. Approximate translation equivalents of *open* in other languages may have more restricted, or more extended usage ranges. Italian *aprire* can probably be used in all circumstances in which English *open* can be used. But in addition, *aprire* is conventionally used in contexts in which *open* is not appropriate: *aprire la radio*, "turn on the radio", *aprire la luce*, "turn on the (electric) light", *aprire il riscaldamento*, "turn on the central heating". These uses are unified by a schematic sense (which bears a resemblance to other uses of the verb), "render some (especially electrical) device operative".

On the network model, the problem of the non-compositionality of complex expressions, which was raised earlier, dissipates. A person does not compute the compositional meaning of *open the window* from the constant meanings of its component parts; any competent speaker of English already knows this expression and knows what it means. But what about expressions with which a speaker is not familiar, such as Searle's *open the Sun*? I would dispute Searle's claim that a person can *understand* this expression, while failing to *interpret* it. A person *tries* to understand it, certainly, by trying to assimilate it to an already familiar use, that is, by trying to establish some kind of similarity between it and an established use. Persons with vivid imaginations, nurtured on science fiction, may be able to come up with various coherent scenarios, in which case they may be said to both understand and be

**Fig. 8.3.** Some collocations of the verb *open*. (From Taylor 1992a)
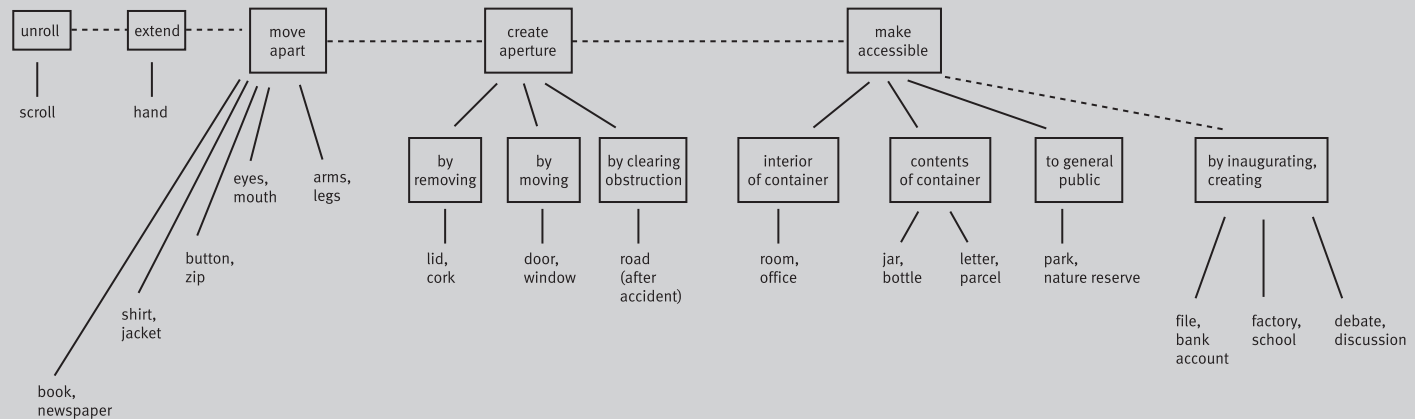
able to interpret it. But if a person's imagination is insufficient to this task, then I think one should have to conclude that the person *does not understand* the expression, for the very reason that he fails to interpret it; the person would declare that he has no idea at all what 'open the Sun' could possibly mean.

One consequence of adopting the network model is that the question of whether a word is polysemous or not turns out to be incapable of receiving a definite answer. The answer will depend on the level of abstraction at which the word's meaning is accessed. As the focus descends to more specific senses, the word will be increasingly polysemous; with focus on the more schematic senses, the word is much less polysemous, even monosemous. Yet neither of these perspectives can be regarded as inherently more correct than the other. To consider only the particular to the neglect of the schematic– and vice versa– impoverishes our understanding of word meaning.

The various tests for polysemy that were mentioned in Section 6.1 may be brought into the picture here. The possibilities of coordination and anaphoric cross-reference require that different uses of a word instantiate one and the same sense. But if polysemy is a function of the level in the network at which meanings are accessed, the results of these polysemy tests ought to vary, even for a single word. This is indeed the case. Sentence (22) only makes sense if Jane and I both live, either near a financial institution, or near a river; a 'crossed' interpretation is not possible. This fact could be taken as evidence of two distinct readings of *bank*.

(**22**)  I live by a bank, and so does Jane.

But now consider (23). (The sentence is due to Deane 1988: 345; Geeraerts 1993 cites some similar examples.)

(**23**) Financial banks resemble those you find by rivers; they control, respectively, the flow of money and of water.

This sentence, unlike (22), invites us to focus specifically on the resemblance between the two kinds of things called *bank*; it forces us to access (or even to create) a schematic sense unifying the two readings of *bank*. Or take a couple of Tuggy's (1993) examples with the verb *paint*.

(**24**) a.  I have been painting, and so has Jane.
     b.  When I'm painting I try to get the colour on evenly, and so does Jane.

If I have been painting white stripes on a parking lot, and Jane has been doing a portrait in oils, (24a) would be at best facetious. This suggests the existence of two discrete senses of *paint*, each associated with a different kind of situation. The zeugmatic effect completely disappears in (24b). The sentence compels us to shift our attention to what is common between a workman painting stripes on a parking lot and an artist painting a portrait; in both cases, a person is engaged in putting colour on a surface.

## Study questions

**1.** The following sentences constitute textbook examples of ambiguity:

(i)   I saw a man with a telescope.

(ii)  Flying planes can be dangerous.

The ambiguity of (i) appears to be due to two different syntactic analyses:

I saw a man [with a telescope]
I saw [a man with a telescope]

It is evident, however, that the two interpretations are associated with two different readings of the preposition *with*. What are they? With respect to the two interpretations of (ii), are these associated with different senses of the verb *fly*?

**2.** The following sentences exemplify some uses of the words *cut*, *into*, and *newspaper*. On the basis of these examples, should the words be regarded as multiply polysemous? Would you, for example, want to claim that *cut* has six distinct, though related, meanings? Alternatively, can at least some of the different uses be brought under a single meaning, which is elaborated in different ways, depending on the contexts in which the words are used? What arguments can be brought to bear on the issue? (In doing this exercise, you may want to consider whether any of the example sentences are ambiguous. In addition to their 'normal' interpretations, can any of the sentences be given less usual interpretations?)

(i)   I cut the cake.
      I cut a slice of bread.
      I cut the grass.
      The hairdresser cut my hair.
      I cut my finger.
      I cut my fingernails.

(ii)  I walked into the room.
      I looked into the room.
      We drove into the desert.
      We drove deeper into the desert.
      I worked into the night.
      I drove my car into a lamppost.
      I cut the cake into six equal portions.

(iii) I bought a newspaper for 50p.
      I bought a newspaper for £10,000,000.
      The newspaper offered me a job.
      I wrote a letter to the newspaper.
      The newspaper published my letter.
      I read about it in yesterday's newspaper.
      The newspaper is printed on pink paper.
      The newspaper was founded in 1900.
      The newspaper is published in New York and Tokyo.

3. Round and Around. A question not addressed in this chapter (nor in the cited studies by Schulze) concerns the possible differentiation of *round* and *around*. (Schulze sees them as synonyms, in free variation.) Investigate the possibility that in their use as prepositions/adverbials, the two words are not fully equivalent. (You might also find differences between different dialects of English.) Is it the case, for example, that certain senses exemplified in Fig. 8.1 are more likely to be associated with one or the other of the two words?

## Further reading

On compositionality and its problems, see Taylor (2002: ch. 6).

On the network model of polysemy, see Taylor (2002: ch. 23).

On the question of the psychological reality of polysemy analyses, see the discussion in Sandra and Rice (1995), Croft (1998), Sandra (1998), and Tuggy (1999).

Studies conducted within the framework of the two-level approach include Herweg (1988), Lang (1991), Wunderlich (1991, 1993), and several contributions to Habel *et al.* (1989), especially Herweg (1989). The most extensive implementation to date of the approach is the formidable Bierwisch and Lang (1987). The term 'two-level' appears to have been popularized by Lang, cf. the title of Lang (1991). As far as I am aware, Bierwisch himself has not used the term. For a critical appraisal of the two-level approach, see Taylor (1994).

# Polysemous Categories in Morphology and Syntax

Polysemy is generally regarded as a property of lexical items, and it was lexical polysemy that was the focus of previous chapters. But polysemy is not just a property of words. Other categories of language structure—morphological categories of number and case, morphosyntactic categories of tense and aspect, the syntactic categories of sentence types, even, as we shall see in Chapter 10, prosodic categories like intonation contours—may also exhibit a cluster of related meanings, and must thus count as instances of polysemy. In this chapter I want to suggest a family resemblance approach to some of these non-lexical categories. As illustrations, I will take examples from morphology (the diminutive) and morphosyntax (the past tense), and conclude with a brief discussion of a syntactic construction (the yes–no interrogative). First, however, I want to introduce the kinds of issues involved with some brief remarks on case.

## 9.1 Case

Languages such as German, Latin, and Russian are notable for the fact that every noun (or, to be more accurate, every noun phrase) has to be marked for one of the case categories—nominative, accusative, dative, genitive, and so on. German has four cases, Latin has five (six, counting the vocative), and Russian

has six. In some of their uses, the cases can be associated with fairly clear-cut meanings. Thus, nominative marks the subject of a verb, accusative the direct object, dative the indirect object, and genitive the 'possessor' in a possessive phrase. It also happens that prepositions require their complements to be in a particular case. Thus, German *aus* "out of" requires a dative complement (*aus dem Hause*, "out of the house"); *für* "for" requires an accusative complement (*für mich*, "for me"); *in* can take either dative (*in dem Hause* "in(side) the house") or accusative (*in das Haus* "in(to) the house"), with, as will be apparent, a notable difference in meaning; while a few take the genitive (*wegen des Regens* "because of the rain"). Certain verbs also require that their complement is in a case other than the accusative: *helfen* "help", for example, takes a dative complement. In addition, some adverbial expressions are marked by a particular case, e.g. *eines Tages* "one day" is in the genitive.

How should we handle this state of affairs? Some possible approaches were discussed by Roman Jakobson in his well-known essay on the Russian cases (1936). One possibility is to regard the cases (nominative, accusative, genitive, etc.) as inherently meaningless; case is a purely formal property of a nominal, which is determined, mechanistically, by the syntactic and lexical context in which it occurs. In the default situation, a direct object will be in the accusative case. However, certain verbs might idiosyncratically require that their direct objects take the genitive case; such verbs will be marked in the lexicon with the subcategorization feature [+genitive]. Similarly, each preposition will subcategorize for the case of its nominal complement. Some will bear the subcategorization feature [+accusative], some the feature [+dative], and so on.

Jakobson rejects this idea, claiming that the cases do contribute meanings to the expressions in which they occur. One reason for assuming that the case categories are meaningful is the fact, already noted, that certain prepositions in German (as well as in Russian) can take more than one case, whereby the choice of case is associated with a semantic choice. German *in* with the accusative has the goal, or directional, meaning "into", whereas *in* with the dative has the place meaning "in". One might, to be sure, claim that German *in* is polysemous, with the two meanings that have been stated. Equally, the two different meanings of *in* do correlate with the case of the associated nominal. A reasonable assumption would be, that directional meaning "into" is in some way compatible with the semantics of the accusative case, whereas the locational meaning "in" is compatible with the semantics of the dative case. The matter is complicated, however, by the fact that the case categories have multiple functions. Accusative case is used, both for the direct objects of (many) verbs, and for the nominal complements of (some) prepositions. The question arises, why the same case category should be used for two distinct syntactic environments.

One approach would be to simply list each of the presumed senses of each case. Essentially, this procedure would reduce the semantics of case to homonymy. Jakobson's approach, in contrast, is to associate each case

category with a unique abstract general meaning, or **Gesamtbedeutung**. 'Local meanings', or **Sonderbedeutungen**, are then derived through an interaction of the abstract meaning—expressed in terms of binary features like [±PERIPHERAL] and [±AFFECTED]—and the particular linguistic context. In this, Jakobson is applying the descriptive apparatus developed in phonology. The phoneme is considered as an abstract entity, characterized in terms of binary features. The actual realization of a phoneme is a function of the context in which it occurs. Thus the /p/ in *pit* is phonetically different from the /p/s in *tip*, *upper*, and *spit*. The local meanings of any instance of a case category are analogous to these contextually determined positional variants of the abstract phoneme category.

Jakobson's core meaning approach to the Russian cases has been criticized by Wierzbicka in her monograph on the Russian instrumental, *The Case for Surface Case* (1980a).While acknowledging the descriptive elegance of Jakobson's analysis, she is led to reject it on the grounds that it would be useless as a means for predicting how the cases are used: 'A person who does not know Russian *cannot* learn to use the Russian cases on the basis of Jakobson's formulas' (1980a: p. xv; author's emphasis). One might similarly question whether Jakobson's highly abstract account can be plausibly taken as a representation of the native speaker's actual state of knowledge. Although Wierzbicka makes no reference in her monograph to prototype theory or to Wittgenstein's reflections on the structure of categories, her approach is entirely consonant with the notion of a family resemblance category that we developed in Chapter 6. Indeed, the following passage, *mutatis mutandis*, could easily be taken as a summary of our analysis of *over* given in Chapter 6. It could equally apply to the examples to be discussed in this and the following chapter:

Cases do have meanings; each case has a large number of meanings, which, however, can be clearly separated from one another. All the different meanings of each case are interrelated. Since every case meaning is complex (i.e. contains a number of distinct components), most meanings share some components with most of the others; it is possible, and even likely—though by no means necessary—that all the meanings of one case may share some of the components (hence the impression that each case has a semantic invariant). But the different 'uses' of a case cannot be regarded as mere contextual variants of one meaning because the formula expressing such a 'core meaning' would be usually too general to have any predictive value; for this reason a number of different, though related, meanings have often to be postulated. (Wierzbicka 1980a: p. xix)

## 9.2 The diminutive

Our first example is the morphological category of the diminutive. English is unusual in that it does not possess a productive diminutive affix. Many other languages, in contrast, have not only one, but sometimes several diminutive morphemes. Interestingly, these morphemes are used not only to indicate the

small size of an entity, but also to express various other kinds of meaning. Diminutive morphemes, in other words, are polysemous. What is more, there is considerable agreement across different languages with regard to the kinds of meaning that can be conveyed by the diminutive.

Since English lacks a diminutive, I shall take most of my examples from Italian. Italian has a large number of diminutive suffixes, three of the most frequent being *-ino*, *-etto*, and *-ello*. Multiple diminutivization is also possible, e.g. *-inello*, *-ettino*, etc. Various factors appear to influence the choice of a particular suffix in any given case. Convention undoubtedly plays a role, as does the phonetic shape of the stem (thus *lettino* "small bed" would be preferred over *lettetto*). There is also evidence for semantic differentiation amongst the different suffixes. Bates and Rankin (1979), while noting considerable between-speaker variation, report that *-ino* tends to be associated with a greater degree of smallness than the other diminutive suffixes.

For the purpose of the following discussion, I shall disregard the possibility of semantic differences amongst the diminutive suffixes and consider the various suffixes as instantiations of a single 'macro'-category. The central sense of the category will be evident. As suggested by its traditional name, the diminutive expresses the small size of a physical entity: *paese > paesino* "small village", *villa > villetta* "small villa". But the diminutive is not restricted to the names of physical entities; nouns designating more abstract entities can also be diminutivized, as can parts of speech other than nouns. We can regard these extended uses as instances of metaphorization, in that the notion of smallness is transferred from the spatial to nonspatial domains. Thus, with respect to nouns, the diminutive can express the short temporal duration, the reduced strength, or the reduced scale of an entity: *sinfonia > sinfonietta* "small-scale symphony", *cena > cenetta* "small supper", *pioggia > pioggerella* "light rain, drizzle". Applied to adjectives and adverbs, the diminutive expresses reduced extent or intensity: *bello* "beautiful" > *bellino* "pretty, cute"; *bene* "well" > *benino* "quite well". Verbs may also be diminutivized. Typical verbal suffixes include *-icchiare* and *-ucchiare*. The diminutivized verbs usually designate a process of intermittent or poor quality: *dormire* "sleep" > *dormicchiare* "snooze", *lavorare* "work" > *lavoricchiare* "work a little, work half-heartedly", *parlare* "speak" > *parlucchiare* "speak (a foreign language) badly".

In these few examples we already have the beginnings of a family resemblance category. As it happens, the different meanings are linked by a common meaning attribute, namely [smallness (on some dimension)]. But the diminutive in Italian (and other languages) may also be used in cases where smallness is not at issue. *Mammina*, a diminutivized form of *mamma* "mother", does not convey small size, but rather an attitude of affection or tenderness on the part of the speaker. First names may also be diminutivized, for the same purpose. This affectionate use of the diminutive is not restricted to nouns denoting animate creatures. *Vestitino < vestito* "dress" and *casella < casa* "house" could mean, quite simply, "small dress" and "small house"; the words could also be

translated as "nice little dress", "nice little house". (Note that English *nice little*—but not *\*nice small*—is roughly equivalent to the affectionate sense of the Italian diminutive; *nice little* does not necessarily, or does not only, indicate small size.) If the use of the diminutive to express the reduced scale of an entity or an activity exemplifies a metaphoric transfer from the central meaning, the extension of the diminutive to express an attitude of affection is an instance of metonymic transfer. Human beings have a natural suspicion of large creatures, while small animals and small children can be cuddled and caressed without embarrassment or fear. The association of smallness with affection is thus grounded in the co-occurrence of elements within an experiential frame.

If smallness is experientially associated with an attitude of affection, smallness also goes with lack of worth. The experiential base is obvious: superior worth correlates with increased size, decreased size with diminished worth. Hence, the diminutive can express, not only affection, but also an attitude of depreciation. In referring to a person's thesis as a *tesina*, a speaker would probably be conveying by the diminutive her low opinion of the work in question. Sometimes one and the same expression can be ambiguous between the two interpretations. (The metonymic extension of the diminutive can thus give rise to the phenomenon discussed at the end of Chapter 6, namely the accommodation of incompatible, even contradictory meanings within a single category.) According to Lepschy and Lepschy (1977: 167), *alberello* < *albero* "tree" could mean either "nice little tree" or "stunted little tree". The same ambiguity may be found in other languages. Zulu *indodakazana* < *indodakazi* "daughter" can be used both in an affectionate and derogatory sense: *lendodakazana yakho* "this (nice) daughter of yours" or "this (horrible) daughter of yours" (Ziervogel *et al.* 1967: 154).

There are further meanings of the diminutive, each with its own experiential base. Things which are small are of little importance. This association gives rise to what we may call the dismissive sense of the diminutive; hence *fatto* "fact" > *fatterello* "matter of no significance", *storia* "story" > *storiella* "lie, fib". Closely related is the approximative use, which is restricted to expressions of quantity; it is as if the exact value is unimportant, and the speaker excuses herself (and at the same time covers herself against possible reproaches) for not being precise. Thus, the person who says that she will return in *un'oretta* (*oretta* is the diminutive of *ora* "hour") would not usually mean that she'll be back in less than an hour. On the contrary! *Oretta* is more in the nature of an approximate indication of duration which the speaker can feel free to exceed.

A somewhat less frequent use of the diminutive is as an intensifier; thus *casino*, the diminutive of *caso* "state of affairs", has the meaning "uproar, chaos". Wierzbicka (1980b: 55) cites a fine example from Spanish: *Son igualitos* "they are the same (diminutive)" conveys perfect identity, i.e. "they are the very same", rather than just more or less the same (cf. *Son iguales*). The

diminutive as an intensifier is also attested in Dutch: *hartje* (< *hart* "heart") can refer not only to a heart of small dimensions *(Een muis heeft een klein hartje* "A mouse has a tiny heart"), but also to the 'very heart', i.e. the centre of something: *in het hartje van de stad* "in the (very) heart of the city" (Dirven 1985). Again we are dealing with a fairly transparent metonymic extension of the central sense; the centre of an entity is necessarily of smaller dimensions than the entity in its totality. Thus the diminutive comes to denote the very essence of a thing, a thing stripped of its non-essential periphery.

From this brief survey, the diminutive emerges as a polysemous category whose various meanings are linked, some through metaphor, some through metonymy, to a central sense, i.e. "smallness in physical space". However, the linking of separate senses to a single central sense by no means entails the presence of a common meaning core. In this, I take issue with Wierzbicka's analysis (1980*b*: 53 ff.). Wierzbicka attempted to unify the various meanings of the diminutive on the basis of a common semantic component, namely that the speaker is 'thinking of an entity as something small, and thinking of it as one would think of something small'. Now, thinking of something as one would of something small undoubtedly constitutes the experiential basis for the metonymic extension of the diminutive. Furthermore, the experiential base would appear to be shared by speakers of very different language communities, hence the remarkable similarities in the semantic extension of the diminutive in different languages. Wierzbicka's formula, however, fails to take cognizance of the distinctiveness of the meanings that can be associated with the category. 'Thinking of something as something small' can imply a range of different, even inconsistent attitudes. Small things can be regarded with affection or contempt, they can be dismissed as unimportant, or prized because of their essentiality. Each of these nuances need not be conventionally associated with the diminutive in any given language. (The use of the diminutive as an intensifier seems to be more common in Spanish than in Italian, for example.) Wierzbicka's formula thus suffers from the same kind of defect that Wierzbicka noted in Jakobson's account of the Russian cases. On the basis of the formula alone, one cannot predict whether a particular use of the diminutive will be sanctioned in a given language or not.

There are two further aspects of diminutivization that I would like to draw attention to. The first concerns the **productivity** of the process. In Italian, the diminutive as an expression of small size can be applied more or less across the board to any noun which denotes a physical entity. Leaving aside the question of the choice of a diminutive suffix (Italian, as we have seen, has several), we are able, in principle, to predict the complete set of forms which exhibit the central sense. Consequently, it will not be necessary to take note of the existence of each of the forms which exhibit the central sense. As we move away from this central sense, diminutive suffixation becomes less productive, i.e. only a subset of the possible candidates for diminutivization is able to occur with a diminutive suffix. Moreover, the non-central senses differ

amongst themselves with respect to their productivity. While the affectionate use of the diminutive is highly productive, the dismissive and approximative uses are restricted to a smallish number of instances sanctioned by convention. Similarly, only a handful of adverbs can be diminutivized; equally sporadic is the diminutivization of verbs. The attested forms are certainly motivated, on the basis of one of the meanings of the diminutive category; the individual forms must nevertheless be listed in the lexicon, and learnt one by one by the language user.

The only limited productivity of certain senses of the diminutive—and the ensuing need for each attested form to be separately learnt—leads to the second characteristic of diminutivization that I would like to mention. Many diminutivized forms, in Italian and other languages, have a tendency to acquire the status of independent lexical items, with more or less **specialized meanings**. A *sinfonietta* is not just a small-scale symphony; it is a musical form in its own right. These specialized forms, too, need to be learnt one by one. The process of semantic specialization has been studied by Dirven (1987) in connection with diminutivization in Afrikaans. Diminutivization, to the extent that it is a productive morphological process in a language (even more so in a language with more than one diminutive suffix), generates a proliferation of forms alongside the base forms. These may come to have the status of 'forms in search of a meaning'. Diminutivization thus becomes an important means whereby a language can extend its lexicon. The specialized meanings can usually be related to the meanings of the base forms by way of one of the meanings of the diminutive suffix; yet the meanings of the diminutivized forms cannot be predicted from the meanings of the constituent parts. Sometimes similar processes of specialization can be found in different languages. Quite common, for instance, is the use of a diminutivized form to refer to the young of an animal: Italian *gattino* (> *gatto* "cat") may be a small cat; it also means "kitten". Somewhat less frequent is the use of the diminutive to refer to feminine gender (see Study question 2, for an example). Otherwise specialization follows quite unpredictable paths. Thus, in Afrikaans, *kaartjie*, the diminutive of *kaart* "map", has come to mean "ticket", and *vuurhoutjie*, from *vuurhout* "firewood", translates as "match".

## 9.3 The past tense

My next example is the past tense. As was the case with the diminutive, the name traditionally given to this morphosyntactic category points to its central meaning: the past tense is used, first and foremost, to locate an event or state at some point or period in time prior to the moment of speaking (or writing). The past tense is thus, primarily, a **deictic** tense;[1] not infrequently, adverbials

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[1] A deictic expression can only be interpreted with reference to the time and place at which it is uttered, and to the person who utters it. Deictic expressions include *here*, *now*, and *I*.

of time (*yesterday*, *a week ago*, *last year*) explicitly locate the past state of affairs with reference to the present. The past tense can also be used non-deictically, as in a historical narrative. In a historical narrative events and states are sequenced with reference to each other, not with reference to the time at which the narrative was composed. By extension, the past tense comes to be used for any kind of narrative, including fictional narratives. Here there can be no question of the past tense locating events prior to the moment of composition, since the events, being imaginary, never took place at all. Even science fiction narratives, in which events are imagined to take place subsequent to the moment of composition, are written in the past tense. In some languages (French is a well-known example) the distinction between the deictic and narrative senses is grammaticalized; the 'passé composé' (*il a vu* "he saw") is employed for deictic reference, while the 'passé historique' (*il vit*) is obligatory in historical and fictional narratives. In English, of course, the same form is used in both cases.

The above paragraph has already sketched out a very simple meaning chain for the past tense: from pastness with respect to the present and the pastness of a historical narrative, the past tense comes to be used as a marker of narrativity *tout court*. The past tense, however, has at least two other very important meanings (or constellations of meanings) in English. These have nothing to do with past time, or with narrativity. Firstly, the past tense indicates the unreality (or counterfactuality) of an event or state. Secondly, the past tense can function as a kind of pragmatic softener.

The **counterfactual** use of the past tense is restricted to a small number of environments—*if*-conditionals (1), expressions of wishes and desires (2), and suppositions and suggestions (3):

(1) If I had enough time, . . .

(2) a. I wish I knew the answer.
     b. It would be nice if I knew the answer.

(3) a. Suppose we went to see him.
     b. It's time we went to see him.

The past tense in these sentences denotes counterfactuality at the moment of speaking, and not at some previous point in time. (1) conveys that, at the moment of speaking, the speaker does *not* have enough time, the sentences in (2) convey that the speaker does not know the answer, while in (3), the proposition encoded in the past tense, if it is to become true at all, will do so after the moment of speaking, that is to say, the past tense refers to a suggested future action. There are also a number of verbs whose past tense forms, under certain circumstances and with the appropriate intonation, can convey the present-time counterfactuality of a state of affairs represented in a past tense subordinate clause (Oakeshott-Taylor 1984*a*):

(**4**) a. I thought John was married ( . . . but he apparently isn't).
    b. I had the impression Mary knew (. . . but it seems she doesn't).

These sentences might occur in a situation in which the speaker has just received information which causes him to doubt the (present-time) factuality of the propositions "John is married", "Mary knows". That it is a present, rather than a past state of affairs, that is at issue is shown by the choice of tense in a tag question. Imagine (5) uttered in a situation in which both speaker and addressee are preparing to go to a concert:

(**5**)  But I thought the concert began at 8, doesn't it?/?didn't it?

The tag *doesn't it* is preferential in the present tense. In (5), the speaker is questioning the apparent counterfactuality, at the moment of speaking, of the proposition "The concert begins at 8".

    The other use of the past tense that I want to consider is also restricted to a small number of contexts. This is the use of the past tense as a **pragmatic softener**. By choosing the past tense, a speaker can as it were cushion the effect an utterance might have on the addressee. Thus, (6b) is a more tactful way of intruding on a person's privacy than (6a):

(**6**) a. Excuse me, I want to ask you something.
    b. Excuse me, I wanted to ask you something.

Tact can also be conveyed by the past tense in association with the progressive aspect:

(**7**) a. Was there anything else you were wanting?
    b. I was wondering if you could help me.

    The softening function of the past tense has been conventionalized in the meanings of the past tense models in English. (8b) and (9b) are felt to be less direct than the (a) sentences; (10b) expresses greater uncertainty than (10a), especially with tonic stress on *might*; (11b) merely gives advice, while (11a) has the force of a command.

(**8**) a. Can you help me?
    b. Could you help me?
(**9**) a. Will you help me?
    b. Would you help me?
(**10**) a. John may know.
    b. John might know.
(**11**) a. You shall speak to him.
    b. You should speak to him.

    Summarizing so far: there are three groups of meanings associated with the past tense: past time (and by extension historical and fictional narrativity), counterfactuality, and pragmatic softening. It is significant that a similar constellation of meanings is found in other languages, too. In Italian, a past

tense (the so-called imperfect) can refer to past time *(Ieri pioveva* "it rained yesterday"); it can in addition express both unreality: *Se sapevo . . .* "If (only) I knew . . .", and tact: *Volevo chiederLe una cosa* "I wanted to ask you something". Zulu children are admonished by their elders not to ask for things with *Ngicela* "I want . . .". Instead, they must use a past tense: *Bengicela* "I was wanting". A past tense is also used in counterfactual conditionals in Zulu: *Uma ebefikile* "If he had come" (Doke 1981: 366; the form *ebefikile* is a 'past in the past'). These remarkable cross-language similarities strongly suggest that the past tense needs to be regarded as a polysemous (rather than a homonymous) category.

But if this is so, how are the different meanings related? Let us begin with the counterfactual sense. Consider sentence (12):

(**12**)  I was ill last week.

On hearing this, one could plausibly draw the inference that the speaker is no longer ill. An account of a past-time state of affairs may well carry the implication of the present-time counterfactuality of that state of affairs. By the perspectivization of this common implication, the past tense can come to convey counterfactuality *tout court*. Of interest in this connection is the ambiguity of B's response in (13).

(**13**)  A: Do you want to come for lunch?
           B: Well, I was expecting an overseas phone call . . .

Speaker B may be declining the invitation. The expected phone call has not yet been received, the speaker would therefore prefer not to leave the office. On this interpretation, *was expecting* refers to past time. Speaker B's response could also preface an acceptance. The past tense conveys that the phone call can no longer be expected, and the speaker is therefore free to accept the invitation. This counterfactual interpretation might impose itself more strongly if *was* receives heavy tonic stress (Oakeshott-Taylor 1984*a*).

The process of meaning extension illustrated by this example has been discussed by Östen Dahl in terms of the 'conventionalization of implicatures':

One powerful mechanism for creating secondary foci [of a polysemous category: J.R.T.] and secondary interpretations is what we can refer to as the conventionalization of implicatures. . . . If some condition happens to be fulfilled frequently when a certain category is used, a stronger association may develop between the condition and the category in such a way that the condition comes to be understood as an integral part of the meaning of the category. For instance, the tendency for categories like the English Perfect to develop 'inferential' interpretations might be explained in this way . . . Another example would be the development of Perfects and Pluperfects into recent and remote pasts, respectively. (Dahl 1985: 11, author's emphasis)

We have already encountered this kind of meaning extension in Chapter 6. In terms of the discussion in Chapter 7, the 'conventionalization of an implicature' is an instance of metonymy.

The softening function of the past tense is more complex, in that it seems to involve a double metaphorization. Firstly, there is the metaphor which construes the domain of time in terms of space—we talk of the *distant past* and the *near future*. The second metaphor applies the schema of distance and proximity to the domain of involvement. Again this is a metaphor which underlies many everyday expressions—one *distances oneself* from a proposal, one has a *close relationship* with a person. Thus, by using the past tense, the speaker can as it were distance herself from the speech act that she is performing. Hence the greater tactfulness of the past tense sentences in (6) and (7).

In the preceding section, I mentioned Wierzbicka's attempt to provide a unified account of the diminutive in terms of a common meaning component. Core meaning accounts of the past tense have also been proposed. Palmer writes:

It has been suggested that the use of unreality and the past time use of the past tense are essentially the same—that the past tense is the 'remote' sense, remote in time or in reality. There is some attractiveness in this idea, for tense could then be seen to have but a single use. (Palmer 1974: 48)

As with the diminutive, however, I believe that it would be a mistake to try to unify the various uses of the past tense on the basis of a common semantic component, such as [REMOTE]—to claim, in fact, that there is really only one meaning of the past tense. Firstly, the notion of 'remoteness' is far too general to serve as a formula for predicting the uses of the past tense. According to such a formula, the past tense could indicate futurity just as well as pastness, and could refer to present-time events taking place at some spatial distance from a speaker. More importantly, the formula ignores the fact that the various senses of the past tense are conceptually quite distinct. Remoteness in past time is a different kind of remoteness from fictional remoteness and remoteness in actuality, while remoteness as a component of pragmatic softening is mediated by very specific conceptual metaphors associating proximity with involvement, and distance with lack of involvement. Furthermore, assigning a single sense to the past tense fails to take due account of the fact that the different uses of the past tense differ in their productivity. As with the diminutive, the more peripheral members of the past tense tend to be instantiated more sporadically and unpredictably than the central members. At issue here is not the existence of past tense forms of verbs (apart from one or two borderline cases,[2] just about every verb in the English language can take the past tense inflection), but rather the contexts of their use. When used with

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[2] The borderline cases concern certain strong verbs when they occur with a prefix or within a compound verb. Prefixed verbs such as *underwrite* and *oversee* seem to me slightly less than optimal in the past tense: (?)*We oversaw the operation*, (?)*We underwrote the project* (though the passive forms: *The operation was overseen*, *The project was underwritten*, are perfectly normal). Compound verbs, when headed by a strong verb, are particularly resistant to past-tense formation: ??*We sightsaw in Paris*, *The minister \*grandstood* (??*grandstanded*) *in Parliament*.

past time reference, there are virtually no restrictions on the use of a past-tense verb. As a marker of counterfactuality, on the other hand, the past tense is typically restricted to a small number of syntactic environments (*If . . ., Suppose . . ., I thought . . .*). The use of the past tense as a pragmatic softener is even more limited. Apart from its use in a small number of fairly routinized expressions (*What was your name again?*), the past tense as a pragmatic softener occurs primarily in conjunction with a small set of modal auxiliaries (*could*, *should*, *might*, etc.). Furthermore, these past tense modals have undergone semantic specialization, a phenomenon noted previously in connection with some diminutivized forms. Although it bears the diminutive suffix, Afrikaans *vuurhoutjie* "match" is not, from a semantic point of view, a diminutive at all. Similarly, the past tense modals have perspectivized the pragmatic softening function of the past tense, and are hardly ever used to refer to past time.[3]

## 9.4 Yes–no questions

My final example of a polysemous category concerns a syntactic construction, the yes–no question.

From a syntactic point of view, we can identify two major question types in English. First are the so-called **wh-questions**. These commence with a question word, such as *who*, *why*, *where*, and are used to request information concerning the identity of a person, reason, place, and so on. The second major category are **yes–no questions**. These commence with a tensed auxiliary verb, and request a specification of the polarity of a proposition. A yes–no question, such as *Did you go to the movies yesterday?*, can be appropriately answered with *Yes* or *No*.[4]

Consider now the sentences in (8), repeated here as (14):

(**14**) a.  Can you help me?
   b.  Could you help me?

These exhibit the characteristic syntax of a yes–no question, namely, [AUX—NP—X], where AUX is an auxiliary in initial position, NP is the subject nominal, and X designates any subsequent material. From this point of view, the sentences appear to be enquiring merely into the listener's ability to help. *Yes, I can/could*, and *No, I can't/couldn't* would therefore constitute appropriate responses. The sentences, however, would not normally be used to elicit this kind of information. Rather, they function as polite requests. Accordingly,

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[3]  One of the few contexts in which the past tense modals do have to do with past time, is in reported speech. Compare: *Can you lend me £5?* and *I asked him whether he could* (*can) *lend me £5*.

[4]  A third type are the so-called echo questions, exemplified by *He said WHAT?*, *You went WHERE?* These typically 'echo' a previous assertion, expressing consternation at its contents, and requesting confirmation of its details. Syntactically, they are characterized by the fact that the wh-word occurs in its 'normal' position in the clause. They are also associated with a special intonation.

an appropriate hearer response would be an offer to help, or, as the case may be, a refusal.

The sentences in (14) therefore exhibit a dissociation between syntactic form (according to their syntactic form, the sentences merely ask for polarity specification) and what the speaker intends. This kind of split between syntactic form and speaker intention has frequently been dealt with in terms of the semantics–pragmatics distinction (e.g. Searle 1975). Semantically, the sentences request polarity specification; pragmatically, they are requests for action by the hearer. As was the case with metaphorical utterances (cf. Section 7.2), it has been proposed that a listener first extracts the literal meaning from a sentence, based on its syntactic form. On finding the literal meaning inappropriate, or in some way bizarre, the hearer then draws on principles of pragmatic inferencing in order to compute the probable intended meaning. This account of polite requests is open to the same kind of criticism as the Searlean account of metaphor. Metaphor, being all-pervasive, cannot reasonably be analysed in terms of grammatical deviance. Similarly, it seems more in keeping with the norms of English usage to regard the sentences in (14) as being in no way bizarre or inappropriate. On the contrary, the sentences exemplify two of the most frequent and unexceptional ways of making a polite request in English.

Searlean accounts of sentences like (14) are based on the presupposition that major sentence types like declarative, imperative, wh-interrogative, and yes–no interrogative constitute clear-cut categories, with regard both to their syntactic form and to their semantic value. The sentences in (14) thus have the same syntactic and semantic value as any other yes–no interrogative; subsequently, we need to invoke pragmatic principles to explain the fact that the sentences are not understood like other yes–no questions. Suppose, however, that we regard sentence types as polysemous family resemblance categories. A yes–no interrogative might now have a range of possible senses. It could be a request for the specification of polarity; alternatively, it might have some of the force of a request. Similarly, a declarative sentence need not only make a statement, it could also have some of the force of a question. In their form, too, sentence types might merge into each other. This possibility has been examined by Givón (1986). Givón cites the following sentences as illustrations of the syntactic and semantic continuum which he claims exists between prototypical imperatives on the one hand, and prototypical yes–no interrogatives on the other:

(15)  a.  Pass the salt! (most prototypical imperative)
      b.  Please pass the salt.
      c.  Pass the salt, would you please?
      d.  Would you please pass the salt?
      e.  Could you please pass the salt?
      f.  Can you please pass the salt?

g. Do you see the salt?
h. Is there any salt around? (most prototypical interrogative)

Givón also sets up a continuum from prototypical declarative to prototypical yes–no interrogative:

(16) a. Joe is at home. (most prototypical declarative)
    b. Joe is at home, I think.
    c. Joe is at home, right?
    d. Joe is at home, isn't he?
    e. Is Joe at home? (most prototypical interrogative)

Let us propose, as the central member of the yes–no interrogative, a question which requests no more than a specification of polarity. In point of fact, the number of occasions on which one asks a yes–no question for the sole purpose of eliciting the specification of polarity is probably quite small. Usually a yes–no question is preliminary to something else. We can distinguish two possibilities. Consider a fairly 'pure' exemplar:

(17) Did you see the Prime Minister on TV last night?

An affirmative response to this question might lead the speaker of (17) to ask additional, more specific questions (*What did she say?, What did you think of her?*, etc). (17), that is, functions as a prelude to further requests, in this case, for information. On the other hand, the speaker of (17) may be using his question merely as a preliminary to his own comment on the Prime Minister's speech. The question, in this case, serves primarily to introduce the topic of the Prime Minister's speech into the discourse. Through perspectivization of these two components, a yes–no interrogative can lose its interrogative force, and come to be used either as a request for information and/or action, or as a statement and/or comment. The first meaning chain can be read off from (15), starting from the bottom, while the second can be traced from the bottom of (16). Thus (18) would invariably be interpreted as a request to the hearer to indicate (if he has the information) where the nearest telephone is, while (19) is merely commenting on the obvious:

(18) Is there a public telephone around here?
(19) Have you lost your keys again?

In support of this approach to the yes–no interrogative we may note that members of the category are sometimes ambiguous (cf. Sadock 1972). (Recall that ambiguity is the hallmark of polysemy.) Thus (20):

(20) Can you play the piano?

could function as a request for polarity specification ("Tell me, is it, or is it not the case, that you can play the piano"), or as a request for the hearer to sit down at a piano and to play. Alternatively, the sentence could be a speaker

comment; the speaker is expressing surprise at learning that the addressee can play the piano.

As with the categories studied earlier in this chapter, some of the instantiations of the more peripheral members of the yes–no interrogative appear to have acquired the status of conventionalized, quasi-independent linguistic forms. It is appropriate, perhaps, to regard certain highly formulaic instances of the yes–no interrogative in this way. The sentences in (21) and (22)—note that one typically experiences uncertainty as to whether to write them with a question mark or not—have no interrogative force whatsoever; the sentences are little more than formulaic expressions of speaker surprise.

(**21**) Would you believe it!
(**22**) Is that a fact?

It is in the context of the yes–no interrogative as a family resemblance category that the sentences in (14) are to be approached. Of course, the semantic extension of the yes–no interrogative is motivated by principles that, in a rather general sense, would be called 'pragmatic'. (But the same is true of any metonymic extension, cf. the metonymic extensions of the diminutive and the past tense.) Yet we do not need a semantics–pragmatics split in order to explain the alleged discrepancy between the form of the sentences and their usual interpretation. That the sentences in (14) are taken as polite requests for action and not as requests for polarity specification, is due to the fact that the yes–no interrogative is a polysemous category with, as one of its members, the *Can you?*-form. That (14b) may be felt to be more deferential than (14a) results from the interaction of this meaning of the interrogative with the pragmatic softening meaning of the past tense.

## Study questions

**1.** Little and small. At first blush, one might suppose that *little* and *small* are synonyms—both categorize an entity in terms of its diminutive size (as compared to the norm for the kind of entity in question). Yet the two words are by no means interchangeable in all contexts:

a small (?little) sum of money
Our house is too small (?little) for our growing family.
a beautiful little (?small) baby
You need to put a little (?small) bit more effort into your work.

On the basis of these and other examples, evaluate the claim that *small* primarily has to do with size, while *little* tends to be associated with affective values, rather like the Italian diminutive in its non-spatial uses.

You might want to extend the study to a comparison of the adjectives *big* and *large*.

**2.** Dutch diminutives. Dutch is a language which makes extensive use of diminutives. Discuss the following examples in terms of the semantics of the diminutive suffix. (Data from Booij 2002)

| | |
|---|---|
| tafel "table" | tafeltje "small table" |
| huis "house" | huisje "nice house" |
| kat "cat" | katje "pussy-cat" |
| auto "car" | autootje "not so good car" |
| boek "book" | boekje "unimportant book" |
| brief "letter" | briefje "non-official letter" |
| bier "beer" | biertje "glass of beer" |
| speel "play" | speeltje "toy" |
| dut "nap" | dutje "a nap" |
| uit "out" | uitje "outing" |
| tien "ten" | tientje "ten-guilder note" |
| dis en dat "this and that" | ditjes en datjes "odds and ends" |
| Geert "boy's name" | Geertje "girl's name" |
| Jan "boy's name" | Jantje "girl's name" |

**3.** *-er* nominals. A very productive derivational suffix in English is *-er*. The suffix can be attached to just about any verb stem in order to derive a noun which denotes a person who performs the activity denoted by the base verb: *singer*, *dancer*, *smoker*, *murderer*. (There are, though, some exceptions; we cannot speak of a \**be-er*, a \**hav-er*, or a \**resembler*.) The suffix has a large number of other uses. Here is a small sample:

grocer, non-believer, good-looker ("woman who looks good"), dish-washer, astronomer, philosopher, prisoner, villager, islander, Londoner, backbencher ("member of parliament who sits on the back benches"), GB-er ("linguist who embraces Government and Binding theory"), hardliner, grasshopper, three-wheeler ("tricycle"), practical joker ("person who performs practical jokes"), sixth-former ("school pupil in the sixth form"), stroller ("baby carriage"), bathers ("bathing costume"), reader ("collection of readings"), quarter-pounder ("hamburger containing a quarter pound of meat"), one-dayer ("one-day cricket match"), non-starter ("suggestion that no one takes up"), no-brainer ("easy-to-solve problem"), cliff-hanger ("exciting novel"), bodice-ripper ("romantic novel")

Supplement these with examples of your own. Identify the different meanings of the *-er* suffix, paying attention to the frequency and the degree of productivity of the different meanings, and the semantic idiosyncrasy of the *-er* forms. How might the different meanings be related in a family resemblance category? (For a detailed discussion of the *-er* suffix, see Panther and Thornburg 2001.)

# Further reading

For a cognitive linguistic account of case categories in German, see Smith (1993). For the semantics of the diminutive, see Jurafsky (1996). For the semantics of the past tense, see Tyler and Evans (2001*b*).

# Polysemous Categories in Intonation

Although polysemy is generally regarded as a property of lexical items, we have seen (Chapter 9) that the association of more than one meaning with a single linguistic form is not limited to the lexicon. Polysemy also characterizes morphological, morphosyntactic, and even syntactic categories. In this chapter we explore the polysemy of prosodic categories involved in a description of intonation.

The main burden of the chapter will be, firstly, to demonstrate that the formal categories employed in an analysis of intonation are indeed polysemous, and, secondly, to show the inadequacy of attempts to state the semantic contribution of intonation in terms of core meanings. Some data pertinent to an important component of English intonation will be analysed with a view to explicating the family resemblance structure of the category.

## 10.1 The problem of intonational meaning

Intonation is one of the most difficult areas of linguistic description. Even linguistically naïve speakers are aware that intonation contributes, in some vaguely felt way, to the total meaning of an utterance. It is the task of the linguist to explicate this semantic contribution. This involves setting up a formal descriptive apparatus, associating a meaning, or range of meanings, to each formal element of the descriptive system.

To this extent, then, the study of intonation is in principle no different from the study of any other component of linguistic structure. In studying tense, for example, we would begin by identifying the formal elements of the tense system, such as, for English, a present tense and a past tense. Then, for each of these formal elements, we try to specify its meaning (or range of meanings), such that, for any given sentence, we can state the semantic contribution of the tense form in question. But whereas it is a relatively straightforward matter to identify the formal elements of a tense system, identifying the formal elements of intonation presents us with a series of problems. Any sentence can be spoken with a virtually limitless range of pitch levels and pitch sequences. The first step in any analysis must be to 'digitalize' the phonetic data, that is, to abstract from the limitless possibilities a small, finite set of meaning-bearing elements. Do we, in accord with the practice of an earlier American tradition (e.g. Pike 1945), analyse intonation in terms of a sequence of discrete pitch levels and terminal contours? If so, how many distinct pitch levels, and what combinatorial patterns, do we recognize? Or do we follow the British tradition (e.g. Halliday 1970) and postulate a set of intonation tunes, or contours? In this case, we need an inventory of tunes, perhaps consisting of a small set of basic tunes and a rather larger set of variants. These tunes then need to be 'mapped' on to the segmental content of the utterance in question (Gussenhoven 1985). Sometimes, a tune will be mapped on to a one-syllable utterance, at other times, it will be mapped on to a quite lengthy utterance. Consider, for example, how the fall-rise tune can be mapped on to *Yes*, *Maybe*, *If you want me to*. In the case of *Yes*, the single syllable carries the fall-rise; with *Maybe*, the fall would occur on *may*, the rise on *be*; with the longer utterance, the fall might occur on *want*, the rise on *to*. Complicating the matter still further is the question of stress, or accent. Do we treat stress, as in the older American tradition, independently of pitch, or, in line with Bolinger (1986) and the majority of British linguists, in terms of pitch movement?

Even assuming that there were agreement (which there is not: see Ladd 1980: ch. 1, for some discussion) on the formal apparatus for intonation description, there remains the second issue, i.e. specifying the semantic contribution of each formal element to the meaning of a given utterance. Here, there is perhaps even less consensus than on the first issue. Not only do linguists disagree on the semantic contribution of any formal element, there is also controversy on the very kinds of meaning that intonation can convey. For some, intonation is primarily attitudinal and affective, that is, intonation signals the speaker's attitude towards both the content and the hearer, as well as the speaker's emotional state (boredom, agitation, etc.). For others, the main role of intonation is to contribute to the cohesion of a text, by signalling the distinction between given and new information, and thereby relating each utterance to previous text. In addition, intonation has a demarcating function; rather like punctuation and paragraphing in the written language, intonation can convey that adjacent words belong together in a syntactic unit,

or, conversely, that adjacent words should be assigned to different units. It can happen, therefore, that the same string of words can be given quite different interpretations, depending on the intonation with which they are spoken. Consider, for example, the way in which intonational phrasing can give rise to two very different interpretations of *She didn't marry him because of his political beliefs*. On one interpretation, she did marry him, but not because of his politics; on the other, she didn't marry him, and that was because of his politics.

It is this second issue—the semantic contribution of the formal elements of intonation—that will concern us in this chapter. In view of the different formal analyses of intonation that have been proposed, I shall base the following discussion, somewhat arbitrarily, on one particular model. Although the categories proposed by the model have been criticized on both acoustic and perceptual grounds (Brown *et al.* 1980), I will assume in what follows the general validity of the kind of analysis proposed by a majority of British linguists. According to the British school—a typical exponent is Halliday (1970)—the domain of intonation is a rhythmically and intonationally coherent stretch of speech known as the **tone unit**. The tone unit contains one or more stressed (in Halliday's terminology: 'salient') syllables. Stressed syllables tend to occur at approximately regular intervals of time; the occurrence of stressed syllables thus determines the rhythm of English speech. Of the stressed syllables in a tone unit, one is especially prominent. This is the **tonic syllable**. The perceptual prominence of the tonic syllable is largely due to the fact that this syllable is the bearer of **tone**, i.e. it is the centre of the intonation contour with which the tone unit is spoken. Halliday—along with many others—recognizes five tones in standard British English: falling, high rising, low rising, falling-rising, and rising-falling. Again in line with many other students of intonation, Halliday lists numerous variants of these five basic tones.

## 10.2 The meanings of falling and rising tones

Is it possible to associate a semantic content with the elements of Halliday's intonation model? Let us restrict our attention to the meaning of tone. I shall review three very different approaches to this question. Halliday himself introduces the topic as follows:

> Since the falling and rising pitch contours constitute the basic elements of English intonation, it would be useful if we could find some overall meaning for them; if we could say, in general terms, what falling pitch means in English and what rising pitch means. (Halliday 1970: 23)

Clearly, Halliday is here preparing the ground for a core meaning approach. The passage continues:

Basically, a falling contour means certainty and a rising contour means uncertainty. This is true in many languages, though by no means all. In English, it takes this particular form: a falling contour means certainty with *regard to yes or no*. We go down when we know whether something is positive or negative, and we go up when we do not know. In other words we go down when we know the *polarity* of what we are saying. (Halliday 1970: 23, author's emphasis)

Halliday then proceeds to apply these core meanings to the contribution of falling and rising tones to various kinds of sentence. The polarity of a statement is known: it is either affirmative or negative. Statements are therefore (usually) spoken with a falling tone. In a yes–no question like *Are you coming?*, it is polarity which is at issue; we should therefore expect yes–no questions to be spoken with a rising tone. Wh-questions, on the other hand, are not about polarity. To ask *Where are you going?* is to enquire about a person's destination, not about whether or not they are going somewhere. Consequently, wh-questions are (generally) spoken with falling tone. Halliday draws on the same core meanings to account for tones involving pitch changes, i.e. his tone 4 (falling-rising) and tone 5 (rising-falling). These tones 'contain two components of meaning, with a "change of mind" in the middle'. Tone 4 thus means "it may seem as though all is clear, but in fact there is more involved". Hence the fall-rise is typically used with expressions of reserved agreement, as in ˇMAYbe, I supˇPOSE so. Tone 5, on the other hand, conveys "there may seem to be a doubt, but in fact all is certain". Consequently, the rise-fall is used for expressions of uncompromising finality, as in *That's all there is* ˆTO it.[1]

   As Halliday points out, the association between falling pitch and certainty, and between rising pitch and uncertainty, exists in many of the world's languages. Very probably, the association has a natural experiential base, and is grounded in a rather intricate web of metaphor and metonymy. Firstly, there is a metaphor which maps the up–down schema from the spatial domain on to the domain of pitch.[2] The very expressions *rising pitch* and *falling pitch* instantiate this metaphor. The up–down schema is also applied to the notions of completion and incompletion, and, by metonymy, to certainty and uncertainty. Matters that have not yet been finalized (in the sense of not having been completed, and therefore still subject to uncertainty) are up, while things that have reached a conclusion are down. Thus we speak of a discussion *getting off the ground*, i.e. getting started, while a discussion which ends *up in the air* is one which has failed to come to a satisfactory end. This second metaphor is very likely based on our experience of flying objects. An object thrown into the air typically describes an arc-like trajectory—first ascending,

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[1] Transcription conventions in these and other examples are as follows: Tonic syllables are capitalized; tone-unit boundaries are indicated (where appropriate) by the slash /; tones are represented by ˋ (falling: Tone 1), ´ (high rising: Tone 2), ˎ (low rising: Tone 3), ˇ (falling-rising: Tone 4), and ˆ (rising-falling: Tone 5).

[2] This spatial metaphor was mentioned in s. 7.2.

then descending—before it comes to rest. Thus falling motion heralds the approaching end-point of the trajectory (and falling pitch the approaching end-point of an utterance), while rising motion signals a continuing trajectory (and rising pitch the need to continue the discourse). This metaphorical association of falling pitch with completion is strengthened by physiological and aerodynamic characteristics of speech production; falling pitch is a natural accompaniment of the decrease in subglottal pressure which occurs as a speaker approaches the end of a breath group (Lieberman 1967).

The idea that the elements of intonation are ultimately grounded in spatial experience is certainly an attractive one (Lakoff and Johnson 1980: 57; Bolinger 1986: 194 ff.). On this approach, the meanings associated with the various tones are not at all arbitrary, but have a natural explanation in terms of metaphor and metonymy. Unfortunately, the natural meanings of the intonation contours proposed by Halliday do not account for all uses of the contours. It may well be true that yes–no questions are generally spoken with rising tone, and that wh-questions are generally spoken with falling tone, and for the reasons that Halliday mentions. But what about the fact that some yes–no questions are spoken with falling tone, and some wh-questions may be asked with rising tone? Do the proposed meanings of the falling and rising tones (i.e. certainty/uncertainty with respect to polarity) explain, let alone enable us to describe, the different nuances in (1) and (2)?:

(1) (a)  Are you `COMing?
    (b)  Are you ´COMing?
(2) (a)  Where are you `GOing?
    (b)  Where are you ´GOing?

Halliday's explication of the rising-falling tone is equally suspect. Consider Halliday's own example—already cited—of a sentence which is nearly always spoken with a rise-fall:

(3) That's all there is ˆTO it.

It is surely not all that enlightening to claim that the semantic contribution of the rise-fall tone is to convey that "there may seem to be a doubt, but in fact all is certain". The formula seems even more irrelevant for utterances where the rise-fall conveys a kind of exaggerated involvement by the speaker, as in (4):

(4) (a)  The concert was ˆAWful.
    (b)  It was fanˆTAStic.

The problem is a familiar one. Given that a semantically relevant formal contrast has been isolated—in this case, the tones—the analyst feels compelled to associate each term of the contrast with an invariant meaning, such that it is possible to account in all cases for the unique semantic contribution of the formal element under consideration. It is not that Halliday fails to make interesting and perceptive remarks on *some* of the meanings (perhaps we

might even want to say, the central, or prototypical meanings) of the English tones. But to regard these meanings as core meanings is to give up on accounting for the contribution of intonation to a wide range of English utterances. Significantly, Halliday himself is aware of the limitations of his approach: 'There are so many different kinds of combinations of falling and rising pitch that anything which is general enough to apply to all of them is not likely to be very enlightening' (1970: 23). Yet the urge to posit core meanings is so deeply ingrained that even a linguist of Halliday's stature pursues the approach none the less.

The same urge characterizes other attempts to explicate intonational meaning. As a further illustration, let us turn to another account of the meanings of the falling and the rising (more precisely: falling-rising) tones, an account that stems from a very different linguistic tradition. I refer to Jackendoff's remarks on intonation in his *Semantic Interpretation in Generative Grammar* (1972: 258 ff.). According to Jackendoff, the (a) and (b) sentences below select falling and rising tone by the same principles:

(5)  a.  ˇFRED ate the `BEANS.
     b.  As for ˇFRED, he ate the `BEANS.

(6)  a.  `FRED ate the ˇBEANS.
     b.  As for the ˇBEANS, `FRED ate them.

Underlying each of these sentences is the proposition "x ate y". Jackendoff claims that of the two variables, $x$ and $y$, one is assigned a value before the other. In (5), $x$ is first assigned the value *Fred*. Given that $x$ has the value *Fred*, it is asserted that $y$ has the value *beans*. Conversely, in (6), the value assigned to $x$ is dependent on the value *beans* having first been assigned to $y$, i.e. given that someone ate the beans, it is asserted that that someone is Fred. In brief, the falling-rising tone signals the independent variable, while the falling tone signals the dependent variable.

In support of this analysis, Jackendoff notes that topicalized elements in a sentence are generally spoken with a fall-rise. The **topic** of a sentence is what the sentence is about, while what is said about the topic constitutes the comment. In English, the topic generally coincides with that constituent of clause structure which is placed in sentence initial position. In the unmarked state of affairs, the topic of a sentence is the subject. **Topicalization** is the selection of a non-subject constituent for sentence initial position. Jackendoff argues that the topic of a sentence is 'chosen freely' (1972: 262), i.e. it is the independent variable. The comment, on the other hand, is dependent on the prior choice of the topic. Accordingly, topics (especially marked topics) are eligible for the fall-rise tone. In (5b) and (6b) the topicalized status of *Fred* and *the beans* is explicitly signalled by the topicalizing phrase *as for*. In (7), on the other hand, the topicalized status of the initial constituents is signalled solely by their position in the sentence. They would typically be spoken with a fall-rise.

(7) (a) ˇBAGELS, I don't like to ˋEAT.
   (b) At six o'ˇCLOCK, ˋFRED walked in.

So far so good. Jackendoff now proceeds to apply his semantic formulas to a further range of sentences, in particular to sentences with only one tonic syllable. Consider, first, a sentence spoken with a falling tone, e.g. (8).

(8) ˋFRED ate the beans.

A falling tone 'marks its focus as a dependent variable, a value chosen not freely, but rather in such a way as to make the sentence true' (1972: 263). This rather tortuous formulation means, in essence, that declarative sentences are spoken with a fall; these sentences are true in virtue of their assigning a particular value to a variable. The case of a sentence with a single falling-rising tone is more difficult. On the assumption that the falling-rising tone signals an independent variable, sentences with a single falling-rising tone ought to be impossible, since such sentences lack a dependent variable. Jackendoff gets out of this difficulty by arguing that in these cases the dependent variable is the affirmation–negation polarity contrast. Underlying the sentences in (9) is the proposition "x ate the beans". Given the prior assignment of the value *Fred* to the variable *x*, the sentences in (9) select positive and negative polarity respectively as their dependent variables.

(9) a. ˇFRED ate the beans.
   b. ˇFRED didn't eat the beans.

(9b) thus receives the interpretation "Given that someone ate the beans, it is asserted that that someone is not Fred" (the implication being that some other person ate the beans). What, though, are we to say about (9a)? Presumably, the sentence would mean "Given that someone ate the beans, it is asserted that that someone is Fred". The problem, now, is to account for the difference between (9a) and (8). Jackendoff's semantic formulas, proposing core meanings for the falling and the falling-rising tones, would seem to be of little help here.

What seems to be missing from Jackendoff's account is the means whereby intonational meaning can be related to discourse context. For this aspect, we can turn to the radically different account of the meaning of tone that is presented in Brazil *et al.*'s *Discourse Intonation and Language Teaching* (1980). More than two decades later, this monograph is still one of the most thoroughgoing, and arguably most successful, attempts at providing a core meaning analysis of English intonation. The authors claim that intonational meaning is exclusively interactional, and has to do with the ongoing creation of text by the participants in a discourse. They relate the use of the falling and the falling-rising tones to the extent of **common ground** between speaker and hearer. Thus a speaker uses a falling tone ('proclaiming tone', in their terminology) to add new information to the common ground, while the falling-rising

tone ('referring tone') is used to mark information as part of the common ground. (A rather similar account of the meanings of tone may be found in Gussenhoven 1983). Thus in (10):

(**10**)  He'll be ˇTWENty in `AUgust.

the hearer is informed when a mutual acquaintance will be twenty, while in (11):

(**11**)  He'll be `TWENty in ˇAUgust.

the hearer is informed how old the acquaintance will be in August. I will not give an account of the wide range of data which Brazil *et al.*'s formulas can accommodate. (We might note in passing that the notions of proclaiming and referring readily encompass Jackendoff's interpretations of (5), (6), and (7).) But a number of facts cast suspicion on the adequacy of proclaiming and referring as core meanings of the tones. Firstly, the authors concede that in many cases there may be no independent basis for deciding whether the content of a tone unit is or is not part of the common ground between speaker and hearer. Sometimes, a speaker may attempt to insinuate solidarity with the hearer by treating new information as if it were shared. Since the analyst can have no access, other than by observation of intonation, to a speaker's intentions in this regard, the account becomes very much *post hoc* and thus empirically unfalsifiable. In addition, there are cases where appeal to common ground would anyway appear to shed little light on choice of tone. Consider the hesitancy of ˇWELL, compared with the relative confidence of `WELL, or the reserved agreement expressed by *I sup*ˇ*POSE so* in contrast with the relatively unreserved agreement of *I sup*`*POSE so*. And what has common ground got to do with the well-known semantic contrast in (12)?

(**12**)  (a) He doesn't want to marry `ANYone.
              i.e. "He wants to marry no one"
        (b) He doesn't want to marry ˇANYone.
              i.e. "He wants to marry someone, but not just anyone"

Many years ago, Pike (1945: 23) set down a guiding principle for the study of intonation: 'Once a particular intonation contour has been isolated . . . its meaning is determined by finding the least common denominator of the linguistic contexts or physical and emotional situations within which that contour occurs.' The above review suggests that Pike's programme has not been realized. Each of the three proposals for specifying the meanings of English tones turns out to be valid for only a certain range of data. For each approach, one can readily find sentences where the semantic contribution of intonation appears to have little to do with the proposed core meaning. Significantly, Cruttenden (1986) concludes his monograph on intonation by singling out, as one of the areas which is likely to dominate intonation research in the next

decade or so, 'the semantics involved in a set of abstract meanings [i.e. core meanings: J.R.T.] to be matched to the set of tones in an intonational lexicon' (1986: 184). Pessimistically, Cruttenden notes that 'it is not yet even clear what sort of meanings are involved'. Nor is this state of affairs restricted to the study of tone. Attempts to associate the choice of tonic syllable within the tone unit to a single core meaning run into the same kinds of difficulty (Oakeshott-Taylor 1984*b*).

The failure of successive generations of linguists to come up with a satisfactory set of core meanings for the elements of intonation should not really surprise us. After all, a search for the least common denominator of all the various uses of *climb* and *over* would equally come to nothing. Significantly, Pike himself suggested an analogy with lexical polysemy. He noted that just as words may have two or more related meanings, 'so with intonational contours one must sometimes indicate a central meaning with minor variations from it' (1945: 23). A hint of the possibility of intonational polysemy may also be detected in one of Cruttenden's publications. Cruttenden (1981) notes that the core meanings of the tones, if there are any, are likely to be of a very high degree of abstraction. After comparing the contribution of a falling vs. rising intonation to different kinds of sentences, he comes up with the following list of semantic dimensions associated with the two pitch contours:

| *Fall* | *Rise* |
|---|---|
| reinforcing | limiting |
| statement | question |
| finality | continuity |
| closed-listing | open-listing |
| conducive | non-conducive |
| statement | statement with reservations |
| dogmatic | conciliatory |

Cruttenden is aware of the difficulty of abstracting a common core from each of the two lists; he even hints, in the following passage, at the possibility of a family resemblance structure linking the various meanings of the two intonation tunes. Unfortunately, the hint is not followed up. His reservations notwithstanding, Cruttenden proposes common core meanings all the same:

The meanings of each list appear to have something in common; there appear to be metaphorical links between the members of each set (preliminary results from naive informants on a sorting task support such links). But it is not easy to put a cover label on each group of meanings. It is, indeed, inevitable that any label used will be vague in itself without knowing the various meanings which it covers. The meanings associated with falling intonations are generally assertive and I suggest the label CLOSED as a cover term for such meanings; similarly, the meanings associated with rising intonations are in general non-assertive and the cover term OPEN is suggested. (Cruttenden 1981: 81)

The core meanings [OPEN] and [CLOSED] are subject to precisely the same criticism which Wierzbicka levelled at Jakobson's account of the Russian cases: the meanings are so general as to be predictively useless. On the basis of the features [CLOSED] and [OPEN], or, alternatively, [ASSERTIVE] and [NON-ASSERTIVE], the person who does not know English could not predict the semantic nuances conveyed by falling vs. rising intonation in any particular instance.

## 10.3  High key

In this section I would like to explore the possibility of a family resemblance approach to intonation, by examining some data taken from Brazil *et al.* (1980). In the main, the formal elements of Brazil's analysis are the familiar ones of the British school: tone unit, tonic syllable, and tone. One innovation concerns the importance attached to key. **Key** is defined in terms of the relative pitch of the first stressed syllable (which may or may not coincide with the tonic syllable) in a tone unit. The system has three values: high, mid, and low. These values are defined, not in absolute pitch terms, but relative to the terminating pitch of the preceding tone unit. The meanings of high, mid, and low key are identified as "contrastive", "additive", and "equative", respectively. Thus, material spoken with low key is presented as equivalent to previously given information, mid key adds information, while high key presents information as contrasting with other information. Now, 'contrast' is one of the most misused terms in studies of intonational meaning (see Oakeshott-Taylor 1984*b* for some discussion). To their credit, Brazil *et al.* offer a very precise definition of what they understand by contrast. Consistent with their overall approach of assigning only discourse meanings to intonation, contrastivity is understood as an interactional phenomenon:

We should, at this point, attempt to clarify the way in which we are using the concept of contrastivity. There is of course a generally recognized, Saussurian, sense in which all linguistic items are contrastive; in this description, however, the term is not to be taken as referring primarily to paradigmatic relations existing between items in the language—so that by choosing 'wife', for instance, one is meaningfully not choosing 'daughter', 'mother', 'sister', 'niece', 'aunt' . . . Rather the additional contrastivity which choice of high key conveys is a social construct, a closed set of items created by the participants as part of the common ground and available and intelligible to them at the time and place of utterance—and sometimes only there. (Brazil *et al.* 1980: 29)

Contrast, then, involves the creation, by the participants in an interaction, of a mutually exclusive set of items. The contrasting items constitute 'choice-exhausting features of the world' (1980: 26), such that a speaker, by selecting one item in the set, rejects the others.

This understanding of contrastivity clearly motivates the choice of high key in the following example:[3]

(13)  / *p* we're going to <u>MAR</u>gate this year / *p* not <u>BOG</u>nor /

Here, the speaker has explicitly created a two-member set (Margate and Bognor), and selects one of the terms rather than the other.[4] In the next example, membership in the set is given by the context of the utterance. Imagine the sentence spoken by a member of a two-car family:

(14)  / *p* <u>WHY</u> not take the /*p* <u>RED</u> car /

By selecting *red car* the speaker is implicitly rejecting the other member of the closed set.

These cases constitute unequivocal instances of contrast, on Brazil's definition of the term. However, as one reads further in the monograph, one cannot fail to notice that Brazil and his co-authors subtly change their understanding of contrastivity. Consider (15):

(15)  / *r* <u>SOME</u> people will like it /

Here, by choosing high key the speaker is said to be emphasizing 'the potential linguistic contrast and opposes "some" to "all" or "none"' (1980: 33). The speaker, then, is not so much creating a closed set of items, as exploiting a closed contrast made available by the linguistic system. A special instance of a linguistically encoded contrast is a contrast of polarity:

(16)  A: It was a good film.
       B: / *p* <u>YES</u> / *p* you're <u>RIGHT</u>/

In this example, high key *yes* is said to convey '"yes-not-no" = "you are right"': the speaker makes a judgment' (1980: 71). Elsewhere (1980: 36) we read that if high key *yes* is often construed as emphatic, this is 'because it means, in terms of a rather odd paraphrase, "You are not wrong!"' The notion of contrastivity as a 'social construct', involving a 'closed set of items created by the participants as part of the common ground', seems to be of less obvious relevance here than in (14) and (15).

In other examples, the high key item is said to rectify a previous misapprehension:

(17)  / *p* i <u>DIDn</u>'t <u>TELL</u> peter about it /

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[3]  The notation is based on Brazil *et al*. The slash / indicates tone unit boundaries; *p* and *r* stand for proclaiming (i.e. falling) and referring (i.e. falling-rising) tone; stressed syllables are capitalized and tonic syllables underlined. High, mid, and low pitch ranges are indicated by vertical arrangement on the page. All the quoted examples are taken from Brazil *et al*. (1980).

[4]  Note that high key on *Bognor* signals that the speaker in this tone unit is selecting the lexical item *Bognor* and rejecting *Margate*. The choice of the linguistic item *Bognor* is not to be confused with the speaker's rejection of Bognor as the intended destination.

Here, high key implies 'you are wrong in thinking Peter knew' (1980: 49). Closely related is the use of high key to signal the speaker's expectation that the hearer will find the content of the tone unit surprising:

(**18**)  / *p* i met henry's <u>BRO</u>ther / *p* he's a <u>BANK</u>er /

This sentence would be appropriate in the context of a presumption that Henry's family are pretty inept when it comes to money matters (1980: 35). We could still perhaps claim that these examples are contrastive, on a rather broad interpretation of Brazil's definition of the term. In (17) there is a closed contrast between the speaker's depiction of a state of affairs and the listener's presumed misapprehension, while in (18) the actual situation, i.e. the brother's financial expertise, contrasts with the expectation of his financial ineptitude. Brazil, however, goes on to use the term contrast to describe the following sentence, where *tennis gear* does not seem to contrast with anything in particular; rather, high key merely implies the unexpectedness, in the circumstances, of the event:

(**19**)  / *r* as soon as he'd finished <u>EAT</u>ing / *p* he changed into <u>TEN</u>nis gear /

Even more remote from the interactional definition of contrast are those cases where the high key item seems to be introducing new information into the discourse, as in the following examples:

(**20**)  / *p* what happened at <u>WIM</u>bledon /
(**21**)  / *p* this is e<u>LIZ</u>abeth / *p* <u>PE</u>ter's wife /

In order to retain the formula 'high key = contrast', Brazil is forced to claim that in cases like these, high key conveys 'an implied setting of the named object against all other possibilities' (1980: 28). In other words, we witness a return to the very general, Saussurian sense of contrast, according to which every linguistic form is contrastive. Difficult to understand in terms of any operationally useful definition of contrast are cases like the following, where, it is claimed, high key 'enables a speaker to indicate that he has chosen a given word or phrase with great care' (1980: 28):

(**22**)  / *p* the <u>GO</u>vernment / *p* have so <u>ANG</u>ered / *r* the farmers of this <u>COUN</u>try /

   Finally, we come to one of the most important functions of high key, and again it is one which seems to have little to do with contrast, on any understanding of the term. This concerns the 'paragraphing' of spoken discourse. A speaker uses high key to open a new phonological paragraph, or, in Brown *et al.*'s (1980: 26) terminology, a new 'paratone'. Typically, a new phonological paragraph coincides with a change in topic:

(**23**)  /r for my <u>MAIN</u> topic this evening / *p* i <u>TURN</u> to eco<u>NOM</u>ic matters /

   This brief review of the semantic contribution of high key in English has led

to the same conclusion as our earlier examination of tone. Having identified the semantic contribution of high key in a limited range of utterances, Brazil and his co-authors feel compelled to apply their semantic formula to all instances of high key, no matter what the consequences for the original definition. This is not, of course, to deny that the monograph abounds in valuable insights into intonational meaning, not the least of which is to have isolated key as an important meaning-bearing component of English intonation. But high key is certainly not the monosemous element it is claimed to be. The examples discussed above suggest that high key has at least ten distinct meanings. These are:

(a)  Explicit contrast involving the members of a closed set (13)

(b)  Implicit contrast within a closed set, where the contrasting members are given by the situational context (14)

(c)  Implicit contrast between members of a closed linguistic system (15)

(d)  Polarity contrast, as a special instance of the above (16)

(e)  Emphasis (16)

(f)  Rectification of a misapprehension (17)

(g)  Unexpectedness (18) (19)

(h)  Introduction of new information (20) (21)

(i)  Careful choice of a linguistic item (22)

(j)  Beginning of a new phonological paragraph, signalling change in topic (23).

Although it would be impracticable to extract a common core from these ten meanings, the meanings are nevertheless related, and appear to cluster in three major groups. Meanings (a) to (d), as well as (f), have to do with selection from a closed set; the closed set may be explicitly stated, it may be derivable from the context of the utterance, or it may be encoded in the linguistic system. A second group has to do with high information value. High key can be used for emphasis (e), to signal unexpectedness (g), or to show that a linguistic form has been selected with great care (i). Thirdly, high key accompanies the introduction into the discourse of new material, whether a new lexical item or a new discourse topic. This is the case with meanings (h) and (j). The second of these sense clusters, i.e. high information content, may be regarded as central. Contrastive uses of high key are related to the central cluster in virtue of the double information conveyed by a contrastive item: in selecting one term of a contrast, a speaker is necessarily also rejecting the other terms. In a rather different sense, new information, or a new topic of discourse, can likewise be regarded as a special instance of high informativity.

This approach to high key could be easily extended to examples of mid and low key. Low key, for instance, would signal in its central sense low informativity, its other meanings (e.g. continuation of the same phonological paragraph) being derivable from this central sense. Furthermore, the approach readily lends itself to a metaphorical interpretation, of the kind outlined earlier for tone. Key has to do with the height of a syllable relative to the terminating pitch of a preceding tone unit. Raised pitch lends perceptual prominence to a syllable. It is natural that the high information content of a tone unit should be signalled by its relative perceptual prominence.

## Study questions

**1.** Low key. Here are some examples of low key, taken from Brazil *et al.* (1980). How might the meanings attributed to low key be brought together in a family resemblance category?

(i)   / *p* we gave it to our NEIGHbours / *p* the ROBinsons /

Here, the implication is that we have only one set of neighbours.

(ii)   / *p* the lecture was CANcelled / *p* the speaker was ILL /

   / *p* the speaker was ILL / *p* the lecture was CANcelled /

Here, the first statement implies the second. The first suggest a 'because' relation, the second a 'therefore' relation.

(iii) A: / *p* I wonder how it'll do in the west END /

   B: / *r* SOME people will like it /

Here, B gives a 'guarded' response; the fact that at least some people will like the play may be taken to mean that the play will do fairly well. Brazil *et al.* speak here of a 'restrictive' meaning.

(iv) A: / *r* you WILL HELP me /

   B: / *r* IF i CAN /

   A: / *p* THANKS /

Here, speaker A closes the exchange. Either speaker is now free to open up a new exchange (or to terminate the interaction).

## Further reading

For the intonation of (British) English, see Halliday (1970), Cruttenden (1986), and Brazil *et al.* (1980). Ladd (1980) deals with the semantic effects of intonation. Bolinger (1986) is a rich source of observations.

# Grammatical Categories

The prototype model of categories was developed in the early 1970s in response to evidence concerning the way people categorize things in their environment. Important landmarks in this research were Labov's studies of the categorization of household receptacles, Berlin and Kay's findings on colour categories, and the work of Rosch and her associates, which refined and extended the insights of Berlin and Kay.

There were, from the outset, two orientations that prototype research could take. The direction of cognitive psychology (cf. Smith and Medin 1981) was to focus on the way concepts are structured and represented in the mind. Alternatively, research on categorization could be channelled into linguistics. Here the emphasis came to be placed, not on concepts *per se*, but on the meanings of linguistic expressions. The two orientations are closely inter-twined. As we saw in the discussion of hedges (Section 4.4), linguistic data and the psychologist's experimental findings mutually complement each other. Indeed, one of the main sources of evidence for conceptual structure is linguistic; conversely, any reasonable account of linguistic semantics needs to make reference to the conceptual structures which linguistic forms conventionally symbolize.

Linguists, while keen to exploit the findings of the cognitive psychologists, were not likely to be content with data limited, in the main, to the names of natural kinds, like birds and fruit, and cultural artefacts, like vehicles and

**Table 11.1** Properties of English strong verbs having /æ/-/ / or / /-/ / in past tense and past participle. *Sing* and *cling*, which share a maximum number of properties typical of the verbs, have a more central status in the categories

|        | /ɪ/ in present tense | Velar as final consonant | Nasal as final consonant |
|--------|---------------------|--------------------------|--------------------------|
| *sing*   | yes | yes | yes |
| *cling*  | yes | yes | yes |
| *hang*   | no  | yes | yes |
| *swim*   | yes | no  | yes |
| *stick*  | yes | yes | no  |
| *strike* | no  | yes | no  |

furniture. In the hands of linguists, the prototype model was rapidly extended so as to encompass concepts of increasing abstraction, not only notions like "murder" and "tell a lie", but also the meanings of grammatical formatives like prepositions and bound morphemes, and even the elusive nuances conveyed by intonation contours. And, of course, it was linguistic evidence (the all-pervasive presence of polysemy) that suggested that prototype categories can be linked in family resemblance structures.

The prototype concept has been incorporated into ever more areas of linguistic research. Hudson (1980) has argued that many of the constructs of sociolinguistics—kinds of speech act (e.g. promise), types of interaction (e.g. business transaction), the parameters of power and solidarity, even the very concept of a speech community—can be usefully regarded as prototype categories, definable in the first instance in terms of clear cases. Another significant development has been the application of the prototype concept to the purely formal elements of linguistic description. Bybee and Moder (1983) claim that 'speakers of natural language form categorizations of linguistic objects in the same way that they form categorizations of natural and cultural objects', which suggests that 'the psychological principles which govern linguistic behavior are the same as those which govern other types of human behavior' (1983: 267). Bybee and Moder (see also Bybee and Slobin 1982) reached this conclusion from a study of certain morphological alternations in English. Amongst the strong verbs are those which, like *sing*, show the vowel alternation /ɪ/-/æ/-/ʌ/ in the present tense, past tense, and past participle. Others, like *cling*, have the pattern /ɪ/-/ʌ/-/ʌ/. The two classes have been moderately productive over the centuries, having extended their membership to include verbs originally in other classes, such as *ring*, *fling*, *stick*, and *dig*. Moreover, verbs which have a vowel other than /ɪ/ in the present tense have been added, e.g. *hang*, *strike*, and, for some speakers, *sneak*, *shake*, and *drag*. These latter, on account of their non-conforming present tense forms, must count as more marginal members of the paradigms. In other respects, too, the paradigms exhibit a prototype structure (Table 11.1). Thus, the majority of the verbs have as stem final consonant a velar nasal (*sing*, *spring*, *cling*). Other

verbs exhibit an only partial similarity to this characteristic of the central members. Some have as their final consonant a non-velar nasal (*swim*, *win*, *spin*), others end in a non-nasal velar (*stick*, *dig*).

The extension of the prototype concept from word meanings to linguistic objects was perhaps inevitable, given the linguist's twofold interest in categories. As noted in the Introduction, not only do linguistic forms symbolically stand for semantic categories, linguistic forms themselves constitute categories. It is with the categorization of linguistic forms that we will be concerned in this chapter, in particular the categories WORD, AFFIX, and CLITIC, as well as the grammatical categories traditionally known as parts of speech. We shall see that there are some remarkable parallels between the structure of semantic categories and the structure of linguistic categories. Just as there are central and marginal members of the semantic category BIRD, so too a linguistic category like NOUN has representative and marginal members. And just as marginal instances of a semantic category like CUP might overlap with marginal instances of neighbouring categories like BOWL or VASE—even though typical cups are quite distinct from typical bowls and typical vases—so too a category like WORD merges, at its boundaries, with categories like AFFIX and CLITIC. Facts like these provide further evidence against the view discussed in Chapter 4, namely, that prototype effects might be merely an aspect of so-called performance, and thus outside the scope of a narrowly defined autonomous linguistics. Rather, prototype effects permeate the very structure of language itself.

## 11.1  Words, affixes, and clitics

The working out of criteria for the identification and classification of linguistic units used to be one of the primary concerns of linguistic enquiry. However, with the advent of the generative paradigm in the late 1950s and early 1960s, the exercise of 'grouping and classification' (Robins 1964: 180) appeared at best superfluous; it was the grammar itself that would 'automatically, by its rules, characterize any relevant class' (Householder 1967: 103). Consequently, there has been relatively little discussion in generative circles of an issue which used to be thought fundamental, namely, how to define such basic units as 'word', 'noun', 'verb', etc. To some extent, then, the subject-matter of the present chapter harks back to earlier concerns, viewing them in the light of the prototype model which has been elaborated in preceding chapters.

As an illustration of what is involved in attributing prototype structure to a linguistic category, I will focus in this section on one of the most basic, and intuitively most salient of all linguistic categories, the **word**.[1] It is notoriously

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[1]  The term 'word' is ambiguous (Lyons 1977: 18 ff.). It can refer to a lexeme (in which case we would say that *run*, *runs*, and *running* are different forms of the same word), or to the different forms of a lexeme (in which case *run*, *runs*, and *running* are three different words). Which of the two senses is intended will hopefully be clear from the context.

difficult to give an adequate definition of WORD, such that one can unhesitatingly delimit the words in any given stretch of language. (Yet this has not prevented linguists from using the word as a theoretical construct.) No one, presumably, would question the word status of *mother* and *husband* in expressions like *This is Jane's mother*, *Meet Jane's husband*. Less clear is the word status of *mother-in-law* and *ex-husband*. Problematic too is the number of words in contractions. How many words are there in the contracted form *there's* in *There's a man been shot?* Suppose we decide that the contracted form consists of two words. What, then, is the identity of the second of the two words? (Note that *There is a man been shot* and *There has a man been shot* are both ungrammatical; cf. Lakoff 1987b: 562 f.)

The existence of intuitively clear cases alongside a number of not-so-clear cases strongly suggests that we are dealing with a prototype category. We can give more substance to this intuition by restricting our attention, in the first instance, to the typical members of the category. Let us begin by listing some of the attributes shared by those linguistic forms which we would unhesitatingly characterize as words:

(a) Words in the stream of speech can be optionally preceded and followed by pauses. In the limiting case, a word can stand alone as an independent utterance. On the other hand, words may not be interrupted by pauses. As Bloomfield (1933: 178) put it, the word is 'the minimum free form'.

(b) In a stress language like English, each word is eligible for stress, both salience (in Halliday's sense) and tonic prominence.

(c) Words are phonologically stable, in two senses. First, material cannot usually be inserted inside a word. Second, a word largely retains its phonological structure, irrespective of the context in which it occurs. To be sure, sounds at the margins of a word may sometimes be affected by processes such as assimilation. Thus, *good boy* may be pronounced [gʊb bɒɪ]. Such between-word processes, however, are often optional, and may be dependent on speech style and speaking rate. On the other hand, assimilations within a word are often obligatory (compare *impossible* and *insensitive*).[2] The stress pattern of a word also tends to be a fairly constant property. Only rarely is word stress affected by context (compare *He's only fourtéen* and *There are fóurteen people*).

(d) On the whole, words are rather unselective with regard to the kinds of item to which they may be adjacent. It may well be true that adjectives, for example, typically precede nouns, or follow the copula verb *be*; it will be

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[2]  **Assimilation** is the process whereby one segment becomes 'more similar', with respect to some aspect of its articulation, to an adjacent segment. In *good boy* [gʊb bɒɪ], the final [d] of *good* has acquired the place of articulation of the following [b]. In *impossible*, the nasal of the negative prefix takes on the place of articulation (bilabial) of the following [p], while in *insensitive*, the nasal has the alveolar articulation of the following [s].

apparent, however, that an adjective can in principle stand next to practically anything.

(e) Under appropriate conditions, words can be moved around in a sentence. The word sequences XYZ and ZXY might be equally acceptable (*I like John*, *John I like*). Again, under appropriate conditions, the second occurrence of a word in a sentence can be deleted: *She can sing but I can't sing* ~ *She can sing but I can't.*

We could go on listing further characteristics of words, but the above selection will suffice for our purposes. The five characteristics effectively distinguish words from units larger than the word (i.e. phrases, which consist of more than one word), and from component parts of words (i.e. stems and affixes). Consider for example the characteristics of **affixes**:[3]

(a) Affixes (such as *-ist* in *realist*) cannot occur independently of the stems to which they attach, neither can a pause, not even a hesitation pause, be inserted between an affix and its stem.

(b) Affixes generally cannot be stressed (though some counterexamples can be cited, such as *-ee* in *addressée*).

(c) Affixes are often integrated into the phonological shape of the word of which they are a part. For example, the phonological shape of the affix may be affected by the stem to which it is attached. Thus, the shape of the plural morpheme in English is determined by the nature of the final sound of the noun stem; compare *dog*[z], *cat*[s], *dish*[əz]. In other cases, the phonological shape of the stem may be affected by the affix. Addition of *-er* to *photograph* causes a change in stress location, as well as a change in the quality of each of the vowels: ['fəʊtəgrɑːf] ~ [fə'tɒgrəfə]. More drastic 'coalescence' between stem and affix may be observed in *musician* [mjuː'zɪʃən], in which the base form *music* ['mjuːzɪk] cannot easily be identified.

(d) Affixes are highly selective with regard to the items to which they attach. The third-person singular marker *-s* and the participial-forming *-ing*, for instance, can only attach to a verb stem, while noun-forming *-ness* can only attach to adjectives. Not every adjective, though, can take the *-ness* affix; we do not have *\*abundantness*, *\*beautifulness*, or *\*intelligentness*.

(e) Affixes cannot be moved around independently of their stems, neither can the second occurrence of an affix be deleted; *singing and dancing* cannot be

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[3] It is usual to distinguish between derivational and inflexional affixes. Derivational affixes are used to create new words, while inflexional affixes change the form of a word according to its syntactic role in a sentence. Examples of the former include the verb-forming *-ize* in *characterize* (< *character*) and the negative-forming *un-* of *untidy*. Examples of inflexional affixes include the number agreement *-s* of *says* and the participle-forming *-ing* of *saying*. The distinction (which in any case is not always clear-cut; see Carstairs 1987: 4 f.) is not relevant to the present discussion.

reduced to *singing and dance*, neither can *she sings and dances* be replaced by *she sing and dances*.

The various phonological and distributional characteristics of words as opposed to affixes can be likened to the attributes on whose basis we decide membership of semantic categories such as CUP and BOWL. Clear examples of the categories emerge in cases when the distinctive attributes of the categories all occur together. If we focus only on the clear cases, the word–affix distinction appears as clear-cut. But just as there are entities which exhibit only some of the typical attributes of CUP and BOWL, with the consequence that these entities are accorded a more marginal status within the categories, so sometimes an application of the tests for word and affix status can give ambiguous results. Consider the definite article *the*:

(a) Although the definite article alone cannot constitute a well-formed utterance, it may be separated from what follows by a hesitation pause.

(b) The definite article, although generally unstressed, can sometimes bear sentence stress (*It was THE worst moment of my life*).

(c) There is a degree of phonological integration between the article and an adjacent item, in that the form of the article may be affected by the following sound: *the* [ðə] *man* vs. *the* [ðiː] *earth.*

(d) *The* can stand in front of practically any part of speech: adjective (*the old man*), adverb (*the incredibly old man*), verb (*the—dare I say—magnificent achievement of our esteemed chairman*), preposition (*the in my opinion magnificent achievement*), and so on.

(e) The definite article cannot be moved around by itself; if it moves, it moves along with the noun phrase of which it is a component. Sometimes a second occurrence of the article can be deleted (*the men and the women* ~ *the men and women*), at other times it cannot (*the old man and the sea* ~ *the old man and sea*).

What then is the status of *the*? Is it an affix? No, because it possesses a certain degree of autonomy: it can be preceded and followed by a pause, it can bear stress, and it is fairly unselective with regard to adjacent elements. Is it then a word? No, because it does not possess the full autonomy of a word: it cannot stand alone in an utterance, it cannot be moved independently of its host, and it is not always subject to deletion under identity. Probably, on the whole, *the* is more of a word than an affix—a fact reflected by our writing system.

The main motivation for this decision is the freedom of *the* to stand adjacent to practically any part of speech. The importance of this criterion derives from the fact that the five tests for wordhood all point to the word as a syntactically and phonologically autonomous entity, intermediate in status between the minimal meaningful unit of language, the morpheme, and the

complex units of phrase and sentence. The concatenation of words is the domain of the syntax, while the word is the domain of morphological (and associated phonological) processes. Many linguists have insisted on the need to keep the two domains separate. Thus, one component of the grammar is responsible for word formation, through, for example, the combination of stems and derivational affixes. Words, in their appropriate phonological form, are listed in the lexicon. Another component is the syntax, which assembles words from the lexicon into well-formed syntactic units. Within this kind of framework, it is clearly necessary to assemble noun phrases in the syntax, rather than to attach the article to all kinds of items in the word-formation components. In spite of some affix-like properties, then, the definite article is best considered to be a word, albeit an untypical one.

The distinction between words and affixes is complicated by the existence of another unit of linguistic structure, the **clitic**. In some respects, clitics are like words, in other respects they are like affixes. Yet their characteristics suggest that clitics form a special category of their own. There are no really good examples of clitics in English, so I will illustrate from Zulu. Zulu has the morpheme *ke*, which attaches indifferently to practically any part of speech—noun, verb, adverb, etc.—generally at the end of whatever happens to be the first constituent of a clause. Its meaning corresponds roughly to English *and . . . then*. More precisely, it seems that *ke* underlines the given status of the sentence topic. Since only one element in any clause can be topicalized, it follows that *ke* can occur only once in a clause. Let us apply the word/affix tests to *ke:*

(a)  *Ke* can never stand alone, neither can it be separated from its host by a pause.

(b)  Zulu does not have sentence stress, so this test does not apply.

(c)  There is obligatory phonological integration with the host. The penultimate syllable of a Zulu word is lengthened. For the purpose of the lengthening rule, *ke* is regarded as an integral part of the word, i.e. the addition of *ke* causes lengthening to shift one syllable to the right. The following examples illustrate the process (the colon represents vowel length, the hyphen indicates a morpheme boundary):

(1)  a.  Ng-uba:ni igama lakho?
         It's-what name your
         "What's your name?"
     b.  Ng-ubani:-ke igama lakho?
         It's-what-then name your
         "And what's your name then?"

(d)  Up to now, *ke* looks like an ordinary affix. One thing that distinguishes *ke* from affixes is the fact already noted, that *ke* can attach to practically

anything, even to a word like *ye:bo* "yes" (*Yebo:ke* "OK, then"). Affixes, it will be recalled, are very selective with regard to the stems to which they attach. Furthermore, in the case of affixes, there are often a number of 'gaps' in their distribution. While the past-tense-forming affix *-ed* only attaches to verb stems, not every verb stem can take the *-ed* suffix. There are no such restrictions on the occurrence of *ke*.

(e) Like affixes, *ke* cannot be moved around. Deletion of a second occurrence is not applicable, since *ke* can only occur once in a given sentence.

It is largely because of their freedom to attach to practically any part of speech that clitics are recognized as a special linguistic unit. Consistent with their special status, it has been proposed that clitics get inserted into a sentence by a special post-syntactic component of the grammar, distinct from both the word formation and the syntactic components (Zwicky 1985). This view is consistent with the fact that semantically clitics are usually different from affixes. Affixes change the semantic content and/or the syntactic function of a word. Clitics, on the other hand, do not affect word meaning or word function, but generally have to do with text structure or speaker attitude.

In spite of the general validity of the distinction, we again, not surprisingly, find borderline cases. Some putative clitics seem more like words, while others are not too different from affixes. Zulu has another morpheme, *nje*, which, like *ke*, attaches freely to different parts of speech; semantically it functions as a downtoner, with the meaning "only", "just". Unlike *ke*, however, *nje* is not phonologically integrated with its host, i.e. it does not affect the location of syllable lengthening. Moreover, it can stand as a one word utterance, with the meaning "so-so", "not bad". *Nje*, then, is a fairly word-like clitic. Or consider the possessive *'s* in English. If *'s* only attached to nouns denoting a possessor, it would constitute a fairly run-of-the-mill affix. But *'s* is not so tightly restricted, cf. *a friend of mine's house*, *The guy I was telling you about's new car*, *Who the heck's book is this?* Here, *'s* attaches to whatever word happens to stand last in a noun phrase, irrespective of its lexical category, and irrespective of whether the word (if a noun) designates the 'possessor'. Consequently, *'s* could be regarded as a fairly affix-like clitic (or clitic-like affix). On the other hand the definite article, because of its freedom to attach to practically anything, might be categorized as a clitic-like word.

Table 11.2 (p. 209) displays the characteristics of words, affixes, and clitics. The table provides compelling evidence for graded membership of the categories in question. There are good, representative examples of words (*mother*), of affixes (*-ed*), and of clitics (Zulu *ke*); there are not such good examples (*the*), and there are borderline cases (*nje* and *'s*). That the categories have graded membership is not a new insight. It was clearly recognized by Robins in a passage which uncannily anticipates the terminology of the prototype theorists:

Words . . . are the products of several different though related criteria. Thus they comprise nuclear members of the category, to which all the criteria apply, more peripheral or marginal ones to which only some apply, and very marginal or doubtful cases in which the criteria may conflict and different conclusions may be reached by the different weighting of the conflicting criteria. (Robins 1964: 194–5)

Even so, many linguists, past and present, have operated on the assumption that what counts as a word or an affix *is* a matter of either-or. Indeed, a modular conception of grammar, with the syntax clearly distinct from the morphology, alluded to in an earlier paragraph, presupposes this approach. To permit degrees of membership in linguistic categories such as WORD makes it necessary to revise, perhaps even to give up, the modular conception. The absence of a clear boundary between affixes and words (and, therefore, between words and phrases) would mean that the grammar of the word (morphology) would merge with the grammar of the phrase (syntax). In fact, both Lakoff (1987*b*) and Langacker (1987) have argued that the lexicon and the syntax should not be regarded as discrete components of the grammar, but rather as regions of a continuum. For Hudson (1984), too, there is no natural division between the way a phrase is composed of words, and the way a word is composed of morphemes. We take up this matter again, in Chapter 12, when addressing the status of constructions.

## 11.2  Grammatical categories[4]

I now turn to a discussion of word classes—the traditional parts of speech— and of syntactic categories like NOUN PHRASE. A useful starting point is the definition of noun in the Collins English Dictionary.

(2) <u>Noun</u>: a word or group of words that refers to a person, place or thing or any syntactically similar word.

This definition consists of two parts. Firstly there is a semantic definition (nouns are defined in terms of what they mean) followed by a syntactic definition (nouns are defined in terms of their similar syntactic behaviour).

   The inadequacy of an exclusively semantic definition of parts of speech has been recognized at least since the earliest days of structuralism. Robins (1964: 228 f.) warned us that 'extra-linguistic' criteria, like meaning, must play no role in the assignment of words to word classes. Although one might quibble over Robins's view of meaning as something extra-linguistic, the strict exclusion of semantic criteria would at first sight appear to be a *sine qua non* for the definition of parts of speech. *Teacher* and *table* are both pretty good examples

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[4] I use the term 'grammatical category' to cover both lexical categories (i.e. parts of speech) and syntactic categories (i.e. NOUN PHRASE, CLAUSE, and other syntactic constructions).

**Table 11.2** Properties of words, affixes, and clitics

| | Can stand alone | Can be separated by pauses | Can be stressed | Phonological autonomy | Selectivity of adjacent item | Subject to movement and deletion |
|---|---|---|---|---|---|---|
| *mother* | yes | yes | yes | high | low | yes |
| *nje* (Zulu) | sometimes | sometimes | n/a | high | very low | no |
| *the* | no | sometimes | sometimes | low | fairly low | sometimes (deletion) |
| *-ed* | no | no | no | low | very high | no |
| possessive *'s* | no | no | no | low | fairly low | no |
| *-ke* (Zulu) | no | no | n/a | low | very low | no |

of words that refer to persons and things. But what about *doorway* and *sky*? Arguably, these are also 'things', but things of a rather intangible nature. We need to relax further our notion of thing as a discrete concrete entity in order to be able to say that a period of time like a year, a colour like red, a property like height, or a state of mind like happiness, are things. Nouns like *swim* (as in *have a swim*) and *arrival*, on the other hand, would appear to refer not to things at all, but rather to activities and events. Thus, on purely semantic grounds, we would have to recognize a gradience of nounhood. *Teacher* and *table* are good examples of nouns, *doorway* and *sky* are less good examples, *year*, *red*, *height*, and *happiness* are rather marginal examples, while *swim* and *arrival* would not appear to be candidates at all. Semantic definitions of other parts of speech turn out to be equally unsatisfactory. Collins defines *adjective* as 'a word imputing a characteristic to a noun or pronoun'. Apart from the fact that it is not nouns as such to which characteristics are imputed, but rather their referents, this definition would exclude from the class of adjectives the word *late* in the expression *my late husband* ('being late' is not a characteristic of 'my husband'), as well as *former* and *each* in *my former wife* and *each day.*

An alternative to a purely semantic approach is given in the second half of the Collins definition of 'noun'. Words are assigned to classes on the basis of common syntactic properties. As Gleason put it, word classes must be characterized by 'maximum homogeneity within the class' (1965: 130). The aim is to set up classes in such a way as to maximize the correlation of formal properties between the members of the class, and to minimize the correlation of properties with members of different classes. The properties in question include at least three kinds of phenomena:

(a) Phonological. In some cases, a grammatical category may be regularly associated with a distinctive phonological structure. In English, compound nouns (*bláckboard*, *phýsics teacher*) are characterized by initial stress, in contrast to adjective-plus-noun combinations (*bláck bóard*, *Américan téacher*), which have stress on both items.

(b) Morphological. It frequently happens that words of a given class, and only words of that class, can take on the morphological trappings of the class. Thus, in English, only verbs can be marked for tense, and only nouns can appear in singular and plural form, and only adjectives and adverbs admit degrees of comparison. Thus, the ability to be inflected for tense can serve as a diagnostic for verb status, and ability to take the plural morpheme is diagnostic of a noun.

(c) Distributional. Typically, certain slots in a syntactic construction are reserved for words of a particular class. A characteristic of adjectives, for example, is the possibility of their occurring between a determiner and a noun in the noun phrase construction [DET ADJ N].

We should note that the above criteria do not always yield unambiguous evidence for category membership. Consider again the adjective category. An adjective like *cheap* exhibits a number of typical adjectival properties. It may be used both attributively and predicatively (*the cheap book*, *the book is cheap*); it can be graded (*very*, *extremely cheap*) and admits both comparative and superlative forms (*cheaper*, *cheapest*); the modified noun may be replaced by pronominal *one* (*an expensive book and a cheap one*). Not all adjectives share all of these properties. Some can be used only in attributive position (*my former husband*, *\*my husband is former*), others only in predicative position (*the child is asleep*, *\*the asleep child*). Others cannot be graded, and do not have comparative forms (*\*a very only child*, *\*a more only child*). Consider, as a particularly problematic example, the status of *apple* in *apple pie*. At first glance, *apple* looks like a noun, and *apple pie* an [N N] compound, analogous to *physics teacher*. Yet some speakers accept the predicative construction (*This pie is apple*, cf. *\*This teacher is physics*); some even accept comparative and pronominal expressions (*This pie is more apple than that one*; *I wanted a meat pie, not an apple one*). Moreover, some speakers employ the stress pattern typical of an [ADJ N] phrase, not that of an [N N] compound, i.e. they say *ápple píe* rather than *ápple pie*. In view of the above uncertainties, a definitive classification of *apple* as either noun or adjective is probably not possible.[5]

With the advent of the generative paradigm, a fourth kind of syntactic property came to the fore; this concerns the ability of a string of words to undergo a transformation. Transformational rules (e.g. rules of movement and deletion) do not operate blindly on any random string of items; each rule requires as input an ordered string of constituents belonging to the appropriate categories. Consider the rule of yes–no question formation. Simplifying somewhat, we can say that the rule converts a string of the form [NP AUX VP] into [AUX NP VP], i.e. the rule inverts the subject NP and the auxiliary. The possibility of a rule applying to a given string of words can thus provide evidence for the grammatical categories present in the input, i.e. the possibility of yes–no question formation may be used as a test both for NP status and for auxiliary-verb status.

The transformational paradigm absolutely requires that membership in grammatical classes is a clear-cut matter. To see why this is so, let us briefly consider some of the properties of Chomsky's Extended Standard Theory (Chomsky 1976). The EST model envisages a grammar consisting of a number of autonomous modules. One module is the so-called 'base component', responsible for generating 'initial phrase markers' (the 'deep structures' of earlier versions of the theory). Initial phrase markers are generated in two

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[5] The situation is not unique to the expression *apple pie*. Consider the status of the first item in *stone wall*, *brick house*, *fruit salad*. In all these cases, the first item designates the material from which something is made. There could be reason, therefore, to claim that these expressions are instances of a special 'material-specifying' construction, with its own distinctive phonological and syntactic properties.

stages. Firstly, the 'categorial component' of the base generates, by means of rewrite rules of the kind S → NP AUX VP, NP → DET N, an 'abstract phrase marker', i.e. a string of category symbols with an associated structural description. The other module of the base, the 'lexical insertion component', slots items from the lexicon into the abstract phrase marker. Any item in the lexicon bearing an appropriate feature, e.g. [N], is a candidate for insertion into the N-slot of the abstract phrase marker. The output of the base is thus a string of items with an associated structural description. This initial phrase marker serves as input to the other components of the grammar, e.g. the transformational and phonological components.

Botha (1968: 67 f.) pointed out that generative grammar offers an exclusively extensional[6] characterization of word classes, that is to say, which items count as members of a class is ultimately a matter of exhaustive listing. Nouns are simply those items in the lexicon which bear the feature specification [N], and which, in virtue of this feature specification, are candidates for insertion under the N-nodes generated by the categorial component. Further properties of nouns—their morphological characteristics, their distinctive distribution, their accessibility to transformational rules—are derivative, in that they fall out from the operation of the base component, and the manner in which its output is handled in the other components of the grammar. Further, the generative model presupposes a limited number of (supposedly universal) categories, like NOUN, VERB, DETERMINER, as well as subcategories of these, such as COUNT NOUN and MASS NOUN as subcategories of NOUN (but these subcategories are subject to the same kind of extensional definition as the superordinate categories). The items in the lexicon are associated with the corresponding word-class features, like [N], [V], [DET]. These features are the syntactic counterparts of the classical phonological and semantic features discussed in Chapter 2. The features, that is, are taken to be binary, primitive, universal, and (presumably) innate, and they necessarily establish either-or membership in the respective categories. As already mentioned, it is in virtue of their feature specification that lexical items can get inserted into the abstract phrase marker; the meaning of the lexical item is irrelevant in this respect. Similarly, transformational rules operate on underlying phrase markers, independently of the semantics of the lexical items which fill the category slots. As a consequence, not only are grammatical categories clear-cut entities, it turns out that the category GRAMMATICAL SENTENCE has clear-cut boundaries too. A grammatical sentence is whatever string happens to be generated as output of the transformational component. It is on this basis that *Colourless green ideas sleep furiously* can be said to be a grammatical sentence. Even the category LANGUAGE has clear-cut boundaries; a language comprises

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[6] A word's **extension** is the set of things in the world that the word can refer to. An extensional definition thus comprises an exhaustive listing of a word's referents. A word's extension is often contrasted with its **intension**, that is, the concept designated by a word, in virtue of which the word is able to refer to things of the appropriate category.

all and only the grammatical sentences generated by the grammar. Expressions not generated by the grammar are, by definition, ungrammatical, and therefore not part of the language.

The far-reaching implications of the generative conception of grammatical categories—in particular the exclusion of semantic criteria from grammaticality, the postulation of a clear dividing line between grammatical and non-grammatical sentences, and the related notion of a language as a well-defined set of grammatical sentences—have been hotly debated since the earliest days of generative grammar; for some critical voices, see Hockett (1968), Matthews (1979), Sampson (1980a), and, more recently, Langacker (1987). Here, I want to restrict my attention to the assumption that it is all-or-nothing membership in a grammatical category that determines syntactic behaviour. It is evident that category membership, as specified by a phrase marker, does not always guarantee the applicability of a transformational rule. The matter was investigated by Lakoff in his 1965 dissertation (Lakoff 1970). Lakoff assembled numerous instances of rules which fail to apply to input strings, even though the inputs meet the structural description of the rule. The phenomenon is particularly frequent with regard to 'minor' rules of word formation. Thus not all transitive verbs undergo agentive nominalization:

(3) a. John is one who imports rugs. →
       John is an importer of rugs.
    b. John was one who knew that fact. →
       *John was the knower of that fact. (Lakoff 1970:20)

and not all verbs permit the formation of words in -*able*:

(4) a. His handwriting can be read. →
       His handwriting is readable.
    b. The lighthouse can be spotted. →
       *The lighthouse is spottable. (Lakoff 1970:32)

'Major' rules are also implicated. For instance, not all transitive sentences of the form [NP V NP] undergo passivization.

(5) a. John kicked the ball. →
       The ball was kicked by John.
    b. John owes two dollars. →
       *Two dollars are owed by John. (Lakoff 1970:19)

Such irregularities can be (and were) taken care of by the flagging of individual items in the lexicon; a verb, for example, could be marked [−PASSIVE] so as to block the application of the passive transformation. Alternatively— but given the extensional characterization of word classes, the alternative amounts to the same thing—word classes might be divided up into smaller subcategories, such that one subcategory undergoes the rule in question while the others do not. Even so, these solutions ignore the possibility that some

items might be better candidates for a transformation than others, i.e. the putative subcategories might themselves have fuzzy boundaries. Consider passivization. Some transitive verbs (like *kick*) readily passivize, others (like *resemble*) do not passivize at all. With *owe*, the situation is not so clear. Lakoff's *Two dollars are owed by John* does seem odd. But what about *Millions of dollars are currently owed by third-world governments*? Complicating the matter still further are occasional examples of what look like passive sentences which have no active counterparts. Corresponding to *I was taken aback by that remark*, we do not have **That remark took me aback*.

The fuzziness of grammatical categories was documented in a series of papers by Ross (e.g. Ross 1972, 1973), who extended the approach taken by Lakoff in his dissertation. Ross showed that in many cases members of a category can be graded with respect to their ability to undergo a range of transformations. The transformations themselves can also be graded, in that some apply more or less across the board to all input strings of the appropriate structure, while others are much choosier in this regard. Consider, for example, the category NOUN PHRASE (Ross 1973). Only some NPs—preferentially those which designate humans—can undergo the rule of double raising,[7] as illustrated in (6):

(6)  a.  It is likely to be shown that John has cheated. →
         John is likely to be shown to have cheated.
     b.  It is likely to be shown that no headway has been made. →
         *No headway is likely to be shown to have been made.

Double raising is a fairly choosy rule, and *headway* (part of the idiom *make headway*) is not very accessible to it. Question tag formation, on the other hand, applies more or less across the board to any subject NP. Even here, though, there are some dubious cases:

(7)  a.  Some headway has been made. →
         Some headway has been made, hasn't it?
     b.  Little heed was paid to her. →
         ?*Little heed was paid to her, was it?

Not even one of the most robust properties of NPs—the fact that, in subject position, an NP determines the number of the auxiliary verb—shows up in all instances. By most of the criteria for subject NP status, such as inversion with the auxiliary in yes–no questions (8b), raising (8c), accusative-gerund complementation (8d), *there* in (8a) must be considered a subject NP. Yet it fails to determine the number of the verb in (8e):

(8)  a.  There's a man at the door.
     b.  Is there a man at the door?

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[7] Raising is a rule which moves a constituent from a 'lower' embedded sentence into a 'higher' sentence; double raising involves two such movements. The acceptability judgements in (6) and (7) are Ross's.

    c. There seems to be a man at the door.

    d. I was surprised at there being a man at the door.

    e. There are (*is) two men at the door.[8]

Contrary to one of the major assumptions of the generative paradigm, it seems, then, syntactic rules *are* sensitive to the lexical content of an expression. Furthermore, lexical items can be graded according to how readily they undergo specific transformations. Neither Ross nor Lakoff in his dissertation employed the terminology of prototype theory, which was developed independently by cognitive psychologists like Rosch. Yet when we read (Ross 1973: 98) of 'copperclad, brass-bottomed NP's', and of some noun phrases being 'more noun-phrasy' than others, we readily recognize the commonality with a prototype approach. Some NPs share a maximum number of typical noun phrase attributes; they constitute more central members of the category. Others—the more marginal members—display only a few of the attributes typical of the category.

The gradience of grammatical categories—like the gradience of the category WORD—is not in itself a new discovery. The notion that word classes have central members, which satisfy a maximum number of criteria of the respective class, and more peripheral, borderline members, was fully articulated in Crystal (1967). With the almost total hegemony of the generative paradigm in the late 1960s and the 1970s the insights of non-generative linguists on this topic tended to be ignored, or forgotten. Since then, we have witnessed a rediscovery of category gradience. Symptomatic is the importance assigned to degree of category membership in the *Comprehensive Grammar of the English Language* (Quirk *et al.* 1985), as compared with the earlier, 1972 grammar (Quirk *et al.* 1972). Interesting, too, is McCawley's comparison of parts of speech with the categories of biological natural kinds:

Parts of speech are much more like biological species than has generally been recognized. Within any part of speech, or any biological species, there is considerable diversity. Parts of speech can be distinguished from one another, just as biological species can be distinguished from one another, in terms of characteristics that are typical for the members of that part of speech (or species), even though none of those properties need be instantiated by all members of the parts of speech (or species). (McCawley 1986: 12)

This view is also not quite so innovative as McCawley would have us believe. Botha (1968: 56) had mentioned (and, as a committed generativist, dismissed) the idea that word classes might exhibit the same kind of structure as biological natural kinds.

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[8] There is considerable dialectal variation regarding the acceptability of *There is two men at the door*; some speakers accept it, others do not. For speakers of a 'conservative' dialect (for whom the sentence is unacceptable), the analysis of subject *there* is far from straightforward. Thus, plural verb agreement appears in the raised construction: *There seem (*seems) to be two men at the door*, suggesting that *there* copies, or anticipates, without overt morphological marking, the number of the following noun phrase (*a man*, *two men*) (cf. Lakoff 1987*b*: 548).

## 11.3  The semantic basis of grammatical categories

In the discussion so far I have endeavoured to adhere to the structuralist maxim of the irrelevance of semantic criteria for word class definitions, and considered grammatical categories solely in terms of their syntactic properties. Even this approach, as we have seen, strongly points to the prototype structure of the categories. I would now like to reappraise the semantic basis for category definition. Cognitive linguists have rejected the notion of a syntactic level of linguistic organization, autonomous of semantics. The aim, as Lakoff (1987b: 491) put it, is to 'show how aspects of form follow from aspects of meaning'. Langacker is even more explicit: 'Cognitive grammar makes specific claims about . . . the notional basis of fundamental grammatical categories' (1987: 183), including the claim that 'all members of a given [grammatical] class share fundamental semantic properties' (p. 189).

Clearly any attempt at a semantic definition of grammatical categories like NOUN and VERB will have to be more sophisticated than the traditional dictionary definitions cited earlier. If nouns and verbs do share semantic properties, these are going to be of a highly abstract nature. Langacker discusses the issue at considerable length (1987: chs. 5–7). His proposal is that NOUN be defined as a linguistic unit which profiles a 'thing', where 'thing' is defined as a 'region in some domain' (p. 189). Similarly, verbs are defined as linguistic units which profile a 'temporal relation', while adjectives, adverbs, and prepositions profile an 'atemporal relation'. Langacker's definition of NOUN readily incorporates the traditional notion of a noun as the name of a person or a concrete object. Persons and objects are bounded regions in the domain of three-dimensional space, while mass concrete nouns, like *water*, profile *un*bounded regions in three-dimensional space. But the definition does not give any priority to the spatial domain. *Red* shares the common property in that it profiles a region in the domain of colour, *a year* is a bounded region in the domain of time, *C-sharp* is a region in the domain of pitch, and so on. Langacker then goes on to characterize 'region' in terms of the 'interconnectedness' of entities within a domain. In this way, nouns which refer to groups of discrete entities, like *archipelago*, *constellation*, and *team*, are brought under the schematic definition. Interconnectedness is inversely related to the 'cognitive distance' between entities within a domain, which is in turn a function of cognitive scanning over time. This understanding of interconnectedness makes it possible to account for the status of deverbal nouns like *arrival*. *Arrival* profiles, not a temporal relation *per se*, but a collectivity of temporally adjacent relations. The profile of a deverbal noun like *jumping*, on the other hand, is analogous, in the temporal domain, to that of a concrete mass noun like *water*. Jumping, as well as other abstracts like love and envy, is construed as a relatively homogeneous and unbounded 'substance', which is instantiated whenever some specific instance of the process or quality occurs.

An alternative to searching for what is common to all members of a grammatical class is to capitalize on traditional definitions, and to incorporate these into a prototype account. It may be noted that the manner in which Langacker takes his reader through his definition of NOUN itself suggests the plausibility of a prototype account. Thus we may say, following tradition, that a noun designates, in the first instance, a discrete, concrete, three-dimensional entity (i.e. a bounded region in three-dimensional space). By a projection of the thing schema on to non-spatial domains, linguistic units which profile regions in the other domains, such as colour, time, and pitch, get included in the noun category. Then, with a more sophisticated definition of region, we account for the noun-status of *archipelago*, *team*, and *arrival*. Finally, we establish a metaphorical link between concrete substances and abstract qualities; Langacker himself needs to appeal to such analogies in order to account for the noun status of abstracts like *love* and *envy*.

A prototype view of a category is not necessarily incompatible with an account which attempts to capture what is common to all the category members (cf. Section 4.2). It would seem, though, that there are good reasons for assigning a certain primacy to the prototype account of NOUN. A prototype view of NOUN entails that some nouns are better examples of the category, while others have a more marginal status. Significantly, the closeness of an item to the (semantically characterized) prototype tends to correlate, in many ways, with its closeness to the prototype defined on purely syntactic criteria. This correlation emerges very clearly from Ross's paper on NPs (1973). As we saw, NPs can be ordered according to their accessibility to various transformational rules. The most accessible (i.e. the most 'noun-phrasy') are those NPs which refer to conscious, volitionally acting, animate creatures, primarily human beings. Somewhat lower on Ross's scale are NPs which refer to concrete inanimates, followed by those which refer to events and abstracts. Even lower are 'meteorological *it*' (*It's muggy*) and 'subject *there*' (*There's a man at the door*). Interestingly, the syntactic criteria even suggest that our earlier characterization of the noun prototype may have been too broad. It seems that the best examples of the category refer, not to any concrete three-dimensional object, but, more specifically, to human beings.

The correlation of syntactic and semantic criteria for nounhood shows up in many places. Consider the possessive construction, as represented by the formula [NP's N], and the kinds of noun which can feature in the possessor NP. A noun like *teacher* is readily available: *the teacher's house*, *the teacher's work*, *the teacher's arrival*. Nouns which are semantically more distant from the prototype are less satisfactory; *the table's surface* and *the building's age* are still (perhaps) OK, but *the sky's colour* and *the doorway's height* are more dubious. Some of the non-prototypical nouns behave rather erratically. *In a year's time* and *the year's work* are standard expressions. One would normally prefer *by the end of the year* to *by the year's end*, although the latter expression is sometimes encountered in journalistic texts. However, analogous

expressions like *before the year's middle* and *since the year's start* are hardly possible. Equally bad are possessive expressions with nouns like *arrival* and *swim*: *my arrival's time*, *the swim's place*. In brief, not any noun can be inserted with equal facility into the possessor slot of the possessive construction. Some occur freely, some hardly at all, while with some insertion is dubious or sporadic. And the ease with which nouns can designate a possessor appears to correlate with closeness to the *semantically* defined prototype.[9]

A prototype approach to word classes is implicit in Givón's (1979) account. Givón argues that the essential difference between nouns and verbs resides in the 'time-stability' of their referents. Time-stability constitutes a continuum. At one pole are those entities with the highest time-stability, i.e. entities which do not change their identity over time. These are (typically) referred to by nouns. Prototypical verbs, on the other hand, refer to entities which lack time-stability, i.e. events and rapid changes in state (1979: 14). A further corollary is that the referents of nouns are characterized in terms of their existence in space; the typical noun-referent is an identifiable, enduring thing. Verb-referents, on the other hand, typically have existence only at a certain point in time; the typical verb-referent is thus an identifiable event (1979: 320 f.).

Developing Givón's approach, Hopper and Thompson (1985) pointed out that status within a grammatical category is by no means a fixed property of a word. The semantically relevant properties—in the case of nouns, the extent to which the noun refers to an identifiable, enduring thing, with verbs, whether the verb refers to a specific dynamic event—can vary according to context. Consider the following sentences (based on Hopper and Thompson 1985):

(9)  a.  We trapped a bear in the forest.
     b.  Bear-trapping used to be a popular sport.

In (a), both *trap* and *bear* are being used as prototypical members of their respective classes. Consistent with this function, both verb and noun can take on the whole range of typically verbal and nominal trappings. The verb is marked for tense (past rather than present), aspect (simple rather than progressive), polarity (affirmative rather than negative), mood (indicative rather than imperative), and voice (active rather than passive). Similarly, the noun can take on the various trappings typical of its class. It can appear as singular or plural, it can be preceded by a determiner, it can be modified by adjectives and relative clauses. The (b) sentence is very different. *Bear* in this sentence does not refer to a discrete identifiable object, neither does *trap* refer to a single identifiable event. Symptomatic of this loss of semantic categoriality is the

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[9]  A similar state of affairs holds with other uses of the '*s* morpheme. Optionally, '*s* may be used in a gerundial expression following a preposition: *without the teacher('s) knowing*, *in spite of the teacher('s) being aware*. As nouns diverge from the prototype, the possibility of using '*s* declines much more rapidly than with the possessive construction: *without the table's being moved*, *in spite of the year's having started*, *as a result of the building's having been demolished*. In the gerundial construction, then, the '*s* morpheme seems to attach only to nouns with the very highest degree of (a semantically defined) nouniness, i.e. nouns which refer to human beings.

fact that neither word can be inflected or modified. We cannot have *bears-trapping*, or *bear-trapped*, in (9b). The potential oppositions between singular and plural, affirmative and negative, past and present, active and passive, are to all intents and purposes neutralized.

The phenomenon is quite general. As Hopper and Thompson (1985) document with data from a range of languages, when a noun which can potentially refer to a discrete entity does not in fact do so, it tends to lose the morphological and distributional attributes of the noun class. In the (a) sentences below, *fire*, *buffalo*, and *president* function, both syntactically and semantically, as highly representative examples of the noun class. The (b) sentences, in contrast, exemplify the partial decategorialization of the nouns. In (10b) the noun has been incorporated into a complex verb (*to make fire*), in (11b) the noun is modifying another noun, while in (12b) the noun does not refer to a specific individual, but designates a role in a social institution. In all three cases, the non-prototypical nouns cannot be modified by an adjective.

(**10**) a. We made a big fire.
     b. We made (*big) fire.

(**11**) a. We ate the meat from a slaughtered buffalo.
     b. We ate (*slaughtered) buffalo meat.

(**12**) a. Meet the new president of the society.
     b. He was elected (*new) president.

The decategorialization of nouns is paralleled by the case of verbs which, in certain contexts, lose the morphological attributes typical of their class. Givón (1984) makes an important distinction between 'realis' and 'irrealis' verb forms. The former—restricted in the main to affirmative, declarative main clauses in the present or a past tense—report on some state of affairs that actually exists, or existed. Irrealis forms, on the other hand, refer to some non-existing, or not-yet-existing, state of affairs. Irrealis forms include futures and negatives, and are typically found in counterfactual clauses and clauses expressing a wish, desire, or command. Very often, irrealis forms exhibit a neutralization of oppositions characteristic of realis. In English, tense contrasts are neutralized in the imperative; the demise of the past subjunctive in modern spoken French and Italian has left only one tense form in the irrealis subjunctive mood; in Zulu, the realis contrast between the recent past tense and the remote past tense gives place in the negative to a single past tense form (Taylor 1987).

The decategorialization of verbs is especially striking in subordinate clauses. It is here that verbs, in English, may appear as infinitives or gerunds. As such, the verbs lose many of their morphological and distributional characteristics, such as agreement with a third-person singular subject, and the ability to be preceded by auxiliaries. Givón (1980) has noted that the occurrence of these

non-finite verb forms correlates strikingly with the extent to which the subordinate clause describes a state of affairs which is dependent on the wishes, intentions, or influence of the subject of the main clause. In (a) below, Peter's departure is an autonomous event, independent of John's reporting of it. The subordinate verb can take any of the tense and aspect contrasts typically associated with categorial verbs. In the remaining sentences, Peter's departure is to a greater or lesser extent dependent on the wishes or action reported in the main clause. Expressions of tense and aspect are impossible.

(13) a. John said that Peter would leave/would be leaving/had left/might leave, etc.
 b. John enabled Peter to leave.
 c. John persuaded Peter to leave.
 d. John forced Peter to leave.
 e. John insisted on Peter leaving.

To the question whether semantic criteria are relevant to grammatical categorization, the answer must be affirmative. Semantic criteria must play a role in any conceptual definition of word classes. This is not to say that all the members of a grammatical category necessarily share a common semantic content. (But neither do all the members of a grammatical category necessarily share the same syntactic properties.) Even less would one want to put forward semantic criteria as the sole basis for deciding category membership. Grammatical categories have a prototype structure, with central members sharing a range of both syntactic and semantic attributes. Failure of an item to exhibit some of these attributes does not of itself preclude membership in the category.

# Study questions

1. Compounds. *Tablecloth* would normally be described as a compound, that is, as a word made up of two constituent words. What are the reasons for regarding *tablecloth* as a single, albeit internally complex word?
   Compounding is a recursive process, that is, a compound word may itself be part of a larger compound. Would you want to regard *tablecloth manufacturer* and *tablecloth design* as single words? Why (not)?

2. What are the characteristic properties of affixes, in contrast to words? (Take the *-ing* of *singing*, the *-ic* of *realistic*, and the *-ian* of *musician*, as prototypical examples of affixes.) Consider now the underlined portions of the following words: _ex-husband_, _pseudoscience_, _anti-communist_, _kitchenware_, _cheeseburger_, _policeman_, _non-native_. In what ways do the underlined morphemes have ambiguous status *vis-à-vis* the categories of word and affix?

**3.** There are good reasons to claim that on semantic grounds, *explosion* is a less prototypical noun than *elephant*. To what extent does degree of semantic prototypicality correlate with the syntactic (especially, the distributional) properties of the two words?

**4.** Could there be reasons to claim that count nouns (such as *symphony*) are better examples of the noun category than mass nouns (such as *music*)? Could it be argued that verbs which designate dynamic processes (such as *walk*) are better examples of the verb category than verbs which designate states (such as *resemble*)?

**5.** Fun. Consider the following uses of *fun*:

> Sally isn't much fun to go out with.
> It's no fun going out with Sally.
> It would be no fun to be with Sally.
> I didn't have much fun with Sally, but I did have lots of fun with Sammy.
> It's {more fun / *funner } to be with Sammy than to be with Sally.
> Sammy is (great) fun to be with.
> To have Sammy around would be fun.
> Sammy is full of fun.
> Sammy is a fun person.

How would you categorize *fun* in terms of the word class (or word classes) to which it belongs? Are there any other words whose distribution parallels (partially or fully) that of *fun*? Tackle this question by considering which words are able to occur in the syntactic environments in which *fun* can occur. Words whose distribution you might consider include *good* (*It's no good*), *use* (*not much use*), and *need* (*there's no need to*). Do you conclude that the distribution of *fun* is unique to this word? What would be the implication of this for a theory of lexical categories?

# Further reading

On word classes, see Givón (1979, 1984), Langacker (1987), and Croft (1991).
On the characteristics of words and affixes, see Taylor (2002: chs. 9, 14, 17).
On different uses of the possessive morpheme, see Taylor (1989, 1996*b*).
On the fuzziness of the prenominal possessives *vis-à-vis* compounds, see Taylor (1995*a*).

# Syntactic Constructions as Prototype Categories

In reviewing the evidence for the prototype structure of grammatical categories, we saw in Chapter 11 that members of a grammatical category do not necessarily exhibit a common set of syntactic properties. Not every noun can be inserted with equal facility into the possessor slot of the possessive construction, not every transitive verb has a passive counterpart, and so on. Possibility of occurrence in a construction is a matter of gradience, some items being readily available, others being totally excluded, with, in between, a range of items whose use is dubious or sporadic. As a consequence, constructions, no less than other kinds of linguistic objects, need to be regarded as prototype categories, with some instantiations counting as better examples of the construction than others.

The main body of this chapter examines the prototype structure of some selected English constructions. First, however, it is necessary to say a few words about the notion of construction within cognitive linguistics, and why we need to recognize constructions in the first place.

## 12.1 Why we need constructions

As was the case with the grammatical categories of Chapter 11, the topic of this chapter harks back to one of the concerns of pre-generative linguistics. Robins (1964: 190), speaking from the perspective of a descriptive structuralist, characterized grammar as the 'description and analysis of structures [that is, constructions: J.R.T.] . . . in terms of recurrent elements and patterns'. With the advent of the generative paradigm, however, constructions ceased to be a focus of interest. One could even say that constructions ceased to have a theoretical status at all. Constructions were merely 'epiphenomena' (Lakoff 1987*b*: 467), the by-product, as it were, of phrase structure and transformational rules. For example, the transitive clause construction—which we may characterize as [$NP_1$ V $NP_2$]—emerges as the product of phrase structure rules, namely, S → NP VP, and VP → V NP. (Further rules are, of course, needed in order to generate the NPs, as well as to supply the tense, aspect, and polarity of the verb.) Lexical insertion into the phrase marker then gives us instances of the construction, such as *The farmer shot the rabbit*.

An immediate problem with this account is that not every NP, and not every verb, is eligible to fill the nodes of the phrase marker. We cannot have \**The envy slept the amoeba*. In order to avoid such undesirable results, it is necessary to stipulate that only a subcategory of verbs, namely the so-called transitive verbs, can be inserted into the phrase marker. One also needs to appeal to selectional restrictions holding between specific verbs and their subject and object NPs. Needless to say, such an approach presupposes that the class of transitive verbs is clearly defined. It also rests on certain assumptions concerning the nature of semantic features—assumptions which we have already had occasion to question (Section 2.3).

There are two further problems with the generative account. First, it ignores the role of the construction itself in determining the acceptability of its instances. The general meaning of a construction, for example, may rule out certain word combinations as unacceptable, simply because the resulting meaning is incompatible with the construction's meaning. I address this topic later in this chapter. The second problem is that it ignores the role of idiomaticity in language. Idioms, by definition, are expressions which have to be specifically learned, they cannot be assembled in accordance with general principles. Now, if the idioms in a language were relatively few in number, and if the idiomatic could be cleanly distinguished from the regular, non-idiomatic 'rest' of a language, the existence of idioms would not be particularly troublesome. The remarkable thing about idioms, however, is how many of them there are, and the many different ways in which an expression can be idiomatic.

First, there are idioms whose semantic properties cannot be predicted,

but which are syntactically quite unremarkable. From a syntactic point of view, *kick the bucket* is a regular VP. In its idiomatic sense "die", however, the expression obviously cannot be generated by inserting items selected from the lexicon, it has to be learned as such. Then there are expressions which contain a word which occurs nowhere outside of that expression. *Aback*, for example, is virtually restricted to occurring in the passive construction. We can have *I was taken aback by that remark*, but the active counterpart *That remark took me aback* is not possible. Not only does this example show that the passive cannot be derived from the active, it also shows that *aback* cannot be listed in the lexicon except as part of the passive verb phrase *be taken aback*.

Whereas *kick the bucket* is syntactically normal, other idioms have a syntax which is unique to the idioms in question. *By and large* coordinates what looks like a preposition (*by*) with what looks like an adjective (*large*). This pattern of coordination is attested nowhere else in English. Similarly, the structure of *none the less*, *never mind*, *eggs is eggs*, *far be it from me (to criticize)*, is unique to these specific expressions.

Of special interest are so-called **constructional idioms**. Similar to idioms of the kind *by and large*, these exhibit an unusual syntax, and cannot therefore be generated by general phrase structure rules. At the same time, constructional idioms are productive, in that their slots can be filled by different items. Consider expressions such as *One more beer and I'm leaving*, *Another botch-up like that and you're fired*, *Two hours and we'll be home* (cf. Culicover and Jackendoff 1997). The syntactic (and semantic) commonality of these expressions will be obvious. The initial nominal names some entity suggestive of a process which, when completed, constitutes the condition for the occurrence of the process stated after *and*. In principle, any lexical material which is compatible with the semantics of the construction can be inserted into it. Important for our purposes is the fact that the *one more* construction is not an isolated example. Other examples of constructional idioms that have been studied in recent years include the correlative construction (exemplified by *The more the merrier*), the incredulity response construction (*What?! Me write a novel?!*), and the *What's X doing Y* construction (*What's this fly doing in my soup?*). Once the number and variety of constructional idioms is recognized, it becomes increasingly attractive to view the syntax of a language entirely in such terms. At one extreme are lexically specified constructions, of the kind *by and large*. At the other extreme are highly general constructions, such as that for the transitive clause. In between are all manner of constructional idioms, of greater or lesser degree of productivity. Given this view of syntax, it will be apparent that it is actually rather difficult to draw a line between the 'idiomatic' and the 'regular'. Morphology can be approached in the same way. On the one hand there are 'idiomatic' word formations, such as the plural form *men* (no other noun in English forms its plural by replacing an internal vowel with [e].) At the other extreme are regular, highly general morphological

constructions, such as that for the present participle [V-ing]. In between are word formation patterns of varying degrees of productivity.

In the last couple of decades, **construction grammar** has emerged as an important trend in cognitive linguistics. Significant landmarks are Lakoff's (1977) paper on linguistic gestalts and Fillmore's (1979*a*) notion of syntactic formulas. Work by Fillmore *et al*. (1988), Goldberg (1995), and Kay and Fillmore (1999) have refined and developed the approach. Perhaps the most extensive account to date remains Lakoff's (1987*b*: 462 ff.) monumental analysis of some sixteen distinct constructions involving deictic and existential *there*, and the manner in which the constructions are related within an overarching family resemblance category.

## 12.2  Elements of a construction grammar

Interest in constructions is not new. As mentioned earlier, structuralist linguists recognized constructions as patterns for the combination of smaller elements. But whereas structuralists were mainly concerned with the purely formal aspects of constructions, construction grammar views a construction as the pairing of a specification of form with a specification of meaning. With regard to its formal specification, a construction can be thought of as a formula consisting of an ordered sequence of slots. Some slots are obligatory to the construction, others might be optional. Each slot carries a specification of the kinds of item that can fill it. In some cases, only very general grammatical categories might be specified, such as noun phrase or transitive verb. In other cases, a small set of candidates might have to be exhaustively listed; in the limiting case, there may be only one possible candidate. For some constructions, the formal characterization may need to refer to prosodic and even paralinguistic information regarding voice quality and accompanying gestures. For example, instances of the incredulity response construction (Lambrecht 1990), such as *Me write a novel?!*, have to be spoken with two tone units, the first tone unit being used for the 'subject' nominal, the second for the 'verb phrase' constituent. Each of these tone units has to have a rising intonation, while the expression as a whole may well be accompanied by a sneering voice quality. Consider, as another example, the 'perceptual deictic', exemplified by *There's the bell!* (Lakoff 1987*b*: 509 ff.). Perceptual deictics would typically be accompanied by a raised forefinger. As mentioned, the statement of a construction's formal aspects is linked to a statement of its meaning, which may include information on conditions and context of use. Meaning is therefore to be understood in a rather broad sense, to embrace both pragmatic and discourse-related matters. The incredulity response construction, for example, would occur in a situation in which a proposition has already been introduced into the discourse. The speaker takes up this proposition and dismisses it as absurd.

If we take constructions—understood as pairings of form and meaning—to be the basic units of syntax, we need to consider the kinds of relation that can exist between the constructions of a language. One kind of relation is that of a part to a whole, that is to say, a construction may function as part of another construction. Take the prenominal possessive construction in English, exemplified by *the teacher's car*. The formal properties of the construction may be represented by the formula [NP's N]. The formula indicates that the first element is a noun phrase. But noun phrases themselves constitute constructions, one possibility being represented by the formula [DET N]. The matter becomes more intricate when we recognize that a possessive of the form [NP's N] not only contains an NP, it also constitutes an NP, and may itself be analysed as an instantiation of the NP formula [DET N], with [NP's] functioning as the determiner. The example illustrates a second kind of relation that can hold between constructions—one construction may be regarded as an instantiation of another construction. The interaction of the part–whole and instance–schema relationships may result in a number of alternative, and equally valid analyses of a given linguistic expression. Thus the noun phrase *The teacher's wife's car* may be represented by the formulas [DET N], [NP's N], [NP's N's N], and [DET N's N's N].

A third kind of relationship between constructions is the 'based-on' relation discussed by Lakoff (1987*b*). Lakoff identifies, amongst the various constructions exhibiting deictic *there*, a central deictic, instantiated by the expression *There's Harry with his red jacket on*, and an activity start deictic, exemplified by *There goes Harry, meditating again*. The two constructions are formally and semantically distinct. Yet certain properties of the latter can be derived from properties of the former. The one, in fact, can be regarded as an extension of the other, similar to the way in which (to take up an example from an earlier chapter) certain uses of *climb* are based on, or extended from, more basic uses of the verb.

It should be emphasized here that a construction-based grammar has no place for transformations, of the kind that used to figure so prominently in generative grammar. To be sure, there are correspondences between active and passive sentences, between prenominal possessives of the kind *the country's president* and *of*-expressions of the kind *the president of the country*. But similarity does not entail the need to posit identity, at some level of description. There can be no question of one construction being transformed into, or derived from, another (Fillmore 1985). The exclusion of transformations is consistent with Langacker's (1987: 46) claim that 'grammatical structure is almost entirely overt'. Semantic content is structured and symbolized, not at the level of some abstract, unobservable underlying representation, but at the surface level of an utterance.

The main focus of the present chapter will be the prototype structure of grammatical constructions. A construction is constituted by the pairing of a meaning with a form. Consistent with the prototype approach, both meaning

and form need to be stated, in the first instance, in terms of central cases. Both may display prototype effects. A construction may be used to express meanings which differ to a greater or lesser extent from the central specification. Similarly, the items which fill the construction slots may diverge from the formal specification of the prototype. The characterization of a construction needs to specify, not only the prototype, but also the manner and the extent of permitted deviation from the prototype.

I have already given a brief account of a grammatical construction in prototype terms—I refer to the discussion of yes–no interrogatives at the close of Chapter 9. There, the focus was on semantic, rather than formal extension from the prototype. The example illustrates an important property of many of the more productive constructions, namely the tendency for some of their members to acquire idiomatic, or formulaic status. From a purely syntactic point of view, *Is that a fact?* is a regular and unremarkable instantiation of the yes–no interrogative. Semantically, however, the sentence is a rather marginal exemplar, in that it does not ask for polarity specification. It could even be argued that it is not even a question at all, instead, it serves purely as an expression of speaker surprise. (When used in its idiomatic sense, the sentence is also associated with a rather special intonation contour.) Neither is the meaning of the expression entirely predictable from the prototype specification. Thus *Is that a fact?* has dual allegiance. On the one hand, the sentence instantiates the yes–no interrogative. At the same time, we can regard the sentence as a construction in its own right. The formula for the construction would have to state the specific lexical items (including the required tense of the verb and the number of the noun) that may occur in the construction slots; the characteristic intonation and precise conditions on use would also have to be specified. Furthermore, the construction would have to be regarded as highly unproductive, since extension from the central specification is hardly possible. For instance, one could not say, as expressions of speaker surprise, *\*Are those facts?*, *\*Were these facts?*, and so on. The phenomenon is quite frequent. The greeting *How do you do?*, the challenge *Over my dead body!*, and the enthusiastic endorsement *You're telling me!* are, from one point of view, instantiations of the wh-interrogative, the prepositional phrase, and the transitive clause construction, respectively. At the same time, the expressions instantiate highly unproductive, one-member constructions. *How do you do?* cannot be extended to encompass *\*How does she do?*, or even *\*How do you all do? You're telling me!* is even constrained with regard to its intonation pattern, in that the construction requires falling tone on *tell* and *me* (*You're `TELLing `ME*). With an alternative intonation, e.g. *You're `TELLing me*, the sentence is no longer interpreted in its idiomatic sense.[1]

Other formulaic expressions are productive, but to a very limited extent.

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[1] On the association of formulaic expressions with a fixed intonation pattern, see Bolinger (1986: 495).

Consider various means for expressing thanks: *Thanks*, *Thanks very much*, *Thanks a lot*, *Thanks a million*. The construction is not freely extendible. One might, as an expression of very enthusiastic gratitude, encounter *Thanks a billion*, but the insertion of other numerals, e.g. *\*Thanks a hundred*, *\*Thanks a thousand*, is impossible. Another construction of low productivity is that instantiated by the expression *day in day out* (Fillmore 1979a). The construction is used to express unchanging monotony. As such, it permits the insertion of alternative time units into the N slots. Predictably, these designate the time periods over which monotony is usually perceived: *week in week out, month in month out, year in year out*. Both very long and very short time units are not permitted: *\*century in century out*, *\*millennium in millennium out*, *\*minute in minute out*, *\*second in second out*. The reason is, clearly, that monotony is not usually measured in terms of seconds and minutes, neither can human beings, with their limited life span, perceive monotony in the succession of centuries and millennia. (One could, however, imagine the writer of a science fiction tale expressing the boredom of a creature of extreme longevity by means of the expression *century in century out*.) In this respect the construction provides a fine illustration of the interdependence of formal and semantic properties.

## 12.3 The prenominal possessive

In this and the following section I examine two highly productive constructions in English. For the first example I return to the prenominal possessive (*John's car*, *the year's work*, etc.). We have already discussed some aspects of the construction's formal properties (Sections 11.3 and 12.2). What about its semantics?

Let us start with the thesis that the prenominal possessive, in its central sense, identifies one entity, the 'possessed', in terms of its possession by another, the 'possessor'. Possession is a difficult and complex concept (see Miller and Johnson-Laird 1976: 558 ff. for some discussion). It is perhaps best thought of as an 'experiential gestalt', in the sense of Lakoff and Johnson (1980, especially chs. 14 and 15). On the one hand, possession is a 'basic' concept; people frequently appeal to it, without needing to analyse it, in order to 'organize their physical and cultural realities' (Lakoff and Johnson 1980: 69). Yet possession is not a semantic primitive. It certainly is possible to identify a number of properties that are shared by instances of the possession relation. Some of them are listed below:

(a) the possessor is a specific human being. Non-human animates, and even less, inanimates, cannot possess things;

(b) the possessed is a specific concrete thing (usually inanimate) or collection of specific concrete things, not an abstract;

(c)  the relation is an exclusive one, i.e. for each thing possessed there is only one possessor;

(d)  the possessor has the right to make use of the possessed; other people can make use of the possessed only with the permission of the possessor;

(e)  the possessor's rights over the possessed are invested in him in virtue of a transaction, i.e. through purchase, donation, or inheritance. The rights remain with him until a further transaction (sale, gift, bequest) transfers them to another person;

(f)  the possessor is responsible for the possessed; he is expected to care for it, and to maintain it in good condition;

(g)  in order that the possessor can exercise his rights and duties with respect to the possessed, possessor and possessed need to be in close spatial proximity;

(h)  the relation of possession is a long-term one, measured in months and years rather than minutes and seconds.

The co-occurrence of the above constellation of properties constitutes cases of prototypical possession. Whenever a relation of prototypical possession, as characterized above, exists between two entities, the relation can be expressed by means of the prenominal possessive construction. But the construction can also be used to encode many other kinds of relationship. These relationships can be regarded as extensions, some minimal, some more substantial, from the prototype. A minimal extension is exemplified by *the dog's bone*. A dog is not a prototypical possessor. Yet the relation of dog to bone comes close to the prototype case in that the dog, having found the bone, claims exclusive rights over it. Consider, as another example, *the secretary's computer*, in the sense "the computer that has been assigned to the secretary for regular use". The relation diverges from prototypical possession in that the secretary has only limited rights over the computer; otherwise the relation exhibits considerable commonality with the prototype. With *John's train* (in the sense "the train John is travelling on"), it is again the possessor's right to use the possessed that is in focus; the rights are, however, limited and non-exclusive. A further important group of possessive expressions encodes the relation of a part to a whole: *John's hands*, *the cat's tail*, *the car's door*, *the play's final act*. Here we witness the perspectivization of spatial proximity of possessor and possessed (g), as well as the temporal duration of the relation (h)—a part is always and necessarily 'near' the thing of which it is a constituent; also, for each part, there is only one whole of which it is a constituent, cf. (c). By extension, the possessive construction comes to encode the long-term relation between a thing and its properties (*John's intelligence*, *the car's road-holding ability*).

Of special importance to a characterization of the possessive construction is the exclusive nature of the relation between possessed and possessor (c). While

a person (the prototypical possessor) may enter into a possession relation with many different things simultaneously, at a given time a thing may enter into a possession relation with only one possessor. Hence a possessive expression is a particularly suitable device for a speaker who wishes to uniquely identify an entity. And indeed, possessive expressions generally do have specific reference; *John's house*, for example, identifies a specific house in terms of its (one and only) possessor. This function of the possessive construction motivates the use of the construction to encode relations which at first sight would appear to have very little to do with possession in the strict sense. Possessive expressions commonly invoke kinship and other interpersonal relationships: *John's wife*, *Mary's rival*, *my friends*. A person can only be described as a wife, a rival, or a friend from the vantage point of a second person. Different vantage points may lead one and the same person to be described, alternately, as wife or mother, rival or associate, friend or enemy. The possessor nominal makes it possible for a speaker to spell out from whose vantage point a given individual is so designated. A similar motivation lies behind expressions like *the company's director*, *the country's president*. Again, a person is a director or a president only from the vantage point of an institution in which he occupies a certain role. Even deverbal nouns (i.e. nouns like *arrival* and *invasion*, which are derived from the verbs *to arrive* and *to invade*) may be construed with possessor nominals, just in case the possessor nominal uniquely 'locates' the abstract entity with respect to one of its participants or circumstances: *the train's arrival*, *the prisoner's escape*, *Poland's invasion*, *yesterday's arrests*, *last night's performance*.

In view of the multiplicity of relations that can be invoked by the possessive construction, some linguists have proposed that the semantics of the possessive are indeterminate. The claim is that the possessive simply identifies one entity by invoking *some* relation between that entity and another entity; otherwise, the meaning is 'quite indeterminate' (Kempson 1977: 125). And indeed, certain possessive expressions are open to multiple interpretations. *John's car* could identify the car as the one John is driving, the one he has rented, the one he owns, the one he has designed, the one he is always talking about—in fact, the expression can invoke just about any relation in terms of which a car can be plausibly identified with reference to a person. Similarly, *John's photograph* could be the photograph that John owns, the one he took, or the one that depicts him. There is, however, some evidence for the primacy of the relation of possession, in the strict sense. The interrogative *Whose car is that?* is not a request to the hearer to name some person who stands in some indeterminate relation to the car; the expression is a request to name the possessor (in the prototypical, or close to prototypical sense) of the car. The possession relation is likewise invoked by contrastive uses of possessive expressions, of the kind *It's not John's photograph*, *it's Max's photograph*. Consider, finally, the following scenario. Someone lends me his car, which I then smash. In approaching a passer-by for assistance, I could quite well say

*I've just smashed my car*, meaning by *my car* no more than "the car I was driving". But it would be highly imprudent of me to report the incident to the friend who had lent me the car with the sentence *I've just smashed my car*. In such a context, the central, prototypical meaning of the possessive construction would very strongly come to the fore.

A prototype approach throws light on certain other matters. It will be appreciated that, semantically, the prenominal possessive construction permits very considerable extension from its prototype characterization. Even so, extension from the prototype goes only so far. It is not the case that *any* entity can be identified in terms of *any* kind of relationship with any other entity. An important constraint is that the possessor should not diverge too much from the prototype specification, i.e. a human being. We saw in Section 11.3 that inanimates and abstracts cannot readily serve as possessors; in these cases, full productivity gradually gives way to idiomaticity and dubious acceptability. In comparison with the [NP's N] construction, other constructions involving possessor nominals permit very little extension indeed from the prototype. Consider predicative possessives, of the kind *This car is John's*. This expression is not open to the multifarious interpretations of *John's car*. The expression invokes a relation of true possession, or a relation which is very close to true possession, such as authorized usage, as sanctioned by an agreement with a car-hire company. Accordingly, [NP's N] expressions which invoke a relation which is rather distant from the possession prototype do not permit predicative rewordings: *This rival is Mary's*, *This door is the car's*, *This invasion was Poland's*, *These arrests are yesterday's*. Another construction involving the possessive morpheme is the postnominal construction: *a book of John's*, *a friend of Mary's*. Again the construction permits only limited extension from the prototype. For instance, non-human possessors are ruled out (**a bone of the dog's*). And while *John's photograph* is open to different semantic interpretations, *a photograph of John's* can only mean "a photograph that John owns".

## 12.4 The transitive construction

I now turn to one of the most productive constructions in English, the transitive clause construction. The following are typical instantiations:

(1) The child kicked the ball.
(2) John moved the table.
(3) Mary shot the intruder.

The syntactic properties of the construction may be represented by the formula [NP$_1$ V$_{TRANS}$ NP$_2$], where NP$_1$ and NP$_2$ stand for the subject and direct object, and V$_{TRANS}$ is a transitive verb. In its prototypical instantiations, both NPs have specific reference, while the verb is realis, i.e. affirmative and

indicative, and in a reporting tense (either present or past). These latter characteristics fall out from the specification of the construction's meaning.

Semantically, the transitive construction is difficult to characterize in a few words. Drawing on Lakoff (1977) and Hopper and Thompson (1980), we can list at least twelve semantic properties of the construction, in its prototypical instantiations. The length of this list should not be taken to imply that the semantics of the transitive clause are particularly complex. On the contrary, the meaning of the construction—like that of the possessive—has the status of an experientially primitive gestalt, cognitively simpler than any of its component parts. Indeed, it would probably be true to say that many of the following properties are understood relative to a prior understanding of the gestalt, the gestalt does not emerge from the summation of independently conceptualized attributes.

(a) The construction describes events involving two, and only two participants, encoded by the subject and direct object NPs respectively;

(b) The identity of the two participants can be determined, that is to say, the subject and direct object nominals have specific reference;

(c) The two participants are highly individuated, distinct from each other and from the background environment;

(d) The event is initiated by the referent of the subject NP, i.e. by the agent. Responsibility for the event thus lies exclusively with the agent. Furthermore, the subject NP is the sentence topic; the subject is what the sentence is about;

(e) The agent acts consciously and volitionally, and thus controls the event. Since consciousness and volition are typically human attributes, it follows that the agent is typically a human being;[2]

(f) As a consequence of the agent's action, something happens to the patient, i.e. the referent of the object nominal. The effect on the patient is intended by the agent. Typically, though by no means necessarily, the patient is inanimate;

(g) After the occurrence of the event, the patient is in a different state from before the event. Usually, the difference is one which would be highly perceptible to an onlooking observer;

(h) The event is construed as punctual. Even though the event necessarily has temporal extension, the internal structure of the event, and the intermediate states between its inception and termination, are not in focus;[3]

[2] With respect to this property, sentences (2) and (3) are open to two interpretations, according to whether the action is carried out intentionally or accidentally. Only the intentional reading is consistent with prototypical transitivity.

[3] Again, sentences (1) and (2) are open to two interpretations with respect to this characteristic, the one punctual ("The child kicked the ball once"), the other iterative ("The child kicked the ball repeatedly").

(i) The agent's action on the patient usually involves direct physical contact, and the effect on the patient is immediate;

(j) The event has a causative component, i.e. the agent's action causes the patient to undergo a change;

(k) Typically, agent and patient are not only clearly differentiated entities, often they also stand in an adversative relationship;

(l) The event reported by the construction is real, not imaginary, hypothetical, or counterfactual. Central instantiations of the construction are realis.

The NP and V slots of the transitive construction can be filled by virtually any combination of items which meet the above specifications. But, like the prenominal possessive, the transitive construction can be used to encode a wide range of states of affairs which differ, in one or more ways, from the paradigm case. To begin with, we may note that the acceptability of a transitive sentence is not, in general, affected by the choice of tense, mood, polarity, or aspect of the verb, even though, cf. (l), only realis verb forms are consistent with prototypical transitivity. The NPs, too, may have generic, or nonspecific reference, contrary to (b):

(**4**)  Elephants uproot trees.

The following sentences illustrate other kinds of deviation, some minimal, others more extensive, from the central case:

(**5**)  The lightning destroyed the tree.
(**6**)  We approached the city.
(**7**)  I read the book.
(**8**)  He brushed his teeth.
(**9**)  I carried the suitcase.
(**10**)  Mary helped John.
(**11**)  John obeyed Mary.

In (5), the subject NP refers to an inanimate force, not a consciously and purposely acting agent. Otherwise, the event is highly transitive. (6) is rather less typical, in that the event is not punctual, and the patient does not undergo any change as a consequence of the subject's action. (7) is untypical in that the patient does not undergo change, while in (8) the patient, being part of the agent, is not maximally individuated *vis-à-vis* the agent. In (9) the event is temporally protracted, while in (10) the adversative component is missing from the agent–patient relationship. Finally, in (11), although an action is carried out by the agent, the event is arguably under the control of the patient, not of the agent.

With some of the above examples we are already quite distant from the central semantic specification of the construction. Indeed, it is doubtful

whether it is still legitimate to speak of the subject of (11) as the agent and of the direct object as the patient. Even further removed from the prototype are those transitive clauses which do not describe an event at all, but rather an act of perception on the part of the subject. In these cases, the role of the subject is better described as **experiencer**, and the direct object as **stimulus**:

(12)  I watched the movie.

Here, the act of watching is still under the control of the subject. In this respect, *watch* is a more transitive verb than *see* (as in *I saw Mary*). In other cases, the experiencer appears as the direct object, while the stimulus stands in subject position:

(13)  The movie fascinated me.

Again, it is still possible to claim that the event in (13) is 'initiated', in some metaphorical sense, perhaps, by the subject, in that properties of the movie are 'responsible' for its effect on the experiencer. However, when the verb encodes a mental state, even this property of the prototype is lost:

(14)  a.  I like John.
      b.  I've forgotten his name.
      c.  I regret the incident.

Still further removed from the prototype are transitive clauses which describe a relation between entities, not some action performed by one entity with respect to another:

(15)  John resembles his brother.

In the following, it may even be queried whether the second nominal in fact designates a participant in the state of affairs. They state, rather, a property of the book and of John, not a relation between these individual entities and a second entity.

(16)  a.  The book costs £20.
      b.  John weighs 85 kg.

What we can identify on semantic grounds as more central members of the transitive construction exhibit a number of syntactic and distributional characteristics not shared by more marginal members. Only sentences with agents which act volitionally can be embedded under *persuade*:

(17)  a.  I persuaded Mary to shoot the intruder.
      b.  *Mary persuaded me to regret the incident.

Only sentences which report on events (rather than states) can be inserted into the clefting expression *What happened was that S*:

(18)  a.  What happened was that the lightning destroyed the tree.
      b.  *What happened was that John resembled his brother.

Only actions allow clefting with *do*:

(**19**)  a.  What elephants do is uproot trees.
      b.  *What the movie did was fascinate me.

The punctual nature of an event is consistent with the occurrence of temporal adverbials like *suddenly*, *at ten o'clock*; non-punctual events are odd in this context:

(**20**)  a.  Suddenly, at 10 o'clock, John saw Mary.
      b.  *Suddenly, at 10 o'clock, we approached the city.

Conversely, punctual events cannot be associated with adverbials expressing temporal extension, like *all morning, for hours on end*:

(**21**)  a.  *Mary shot the intruder for hours on end.
      b.  I carried the suitcase for hours on end.

Patients which are affected by the action of the agent can readily stand as subject of a passive sentence; the ungrammaticality of a passive counterpart indicates that the object of a transitive sentence is in no way acted upon by the agent:

(**22**)  a.  The ground was dug by me.
      b.  *£20 have been cost by the book.

Although many of the sentences cited so far have been rather distant, semantically, from the construction's prototype specification, the construction has retained a high degree of productivity, in that less central instantiations are subject to very few constraints of a non-predictable, idiomatic nature. Although *X saw Y* is not a very good example of a transitive sentence, it is still the case that practically any nominal denoting a sighted creature can stand as the subject of *see*, while the name of any visual stimulus can function as its direct object; the same applies, *mutatis mutandis*, to other verbs of perception, like *hear*, *feel*, *smell*, *taste*. In the next section we examine some more marginal members of the construction, where full regularity gives way to idiomaticity.

## 12.5  The transitive construction: more marginal members

A striking feature of English over the centuries has been the steady encroachment of the transitive construction to encode states of affairs which diverge increasingly from prototypical transitivity. A well known example concerns the development of experience verbs like *think* and *like*. In Old English, the stimulus stood as the nominative-case subject of the verb, while the experiencer appeared in the dative case:

(23)    Þam cynge licoden peran.
        "to the king (DAT) liked pears (NOM)"
        (cf. Hawkins 1986: 68)

The extension of the subject-verb-object pattern continues apace in modern English. Symptomatic is the possibility of deleting a path preposition from a prepositional phrase following an intransitive verb of motion:

(24)    He swam across the Channel. →
        He swam the Channel.[4]

In the first sentence, the verb is intransitive. Swimming is an activity involving only one participant, namely the swimmer, with the prepositional phrase indicating the path the swimmer follows. In the second sentence, the path has been incorporated into the verb. *Swim* here means "swim across" (a usage which according to the OED dates from the end of the sixteenth century), with the consequence that the event is now encoded by a transitive sentence. That *the Channel* is now the direct object of *swim* is confirmed by the existence of a passive counterpart (*The Channel was swum*). Other manner of motion verbs, e.g. *fly*, behave in a similar way:

(25)    He regularly flies across the Atlantic. →
        He regularly flies the Atlantic.

Yet this extension of the construction is not fully productive. A path preposition cannot always be deleted from a prepositional phrase following an intransitive verb of motion:

(26)    The child crawled across the floor.
        *The child crawled the floor.

(27)    We drove across the Alps.
        *We drove the Alps.

Not even all examples with *swim* (*across*) are fully acceptable:

(28)   ?She swam our new swimming pool.

It would seem, then, that the possibility of using a verb of motion in a transitive sentence is an idiomatic property of individual lexical verbs. To judge from (28), which nominals are permitted as direct object is also a matter of idiom.

The transitive construction comes to be applied to other one-participant events through the use of a semantically (relatively) empty verb and a deverbal nominal as its direct object:

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[4] The arrow in this and following examples does not indicate the derivation of the one sentence from the other. The sentences on either side of the arrow, while systematically related in meaning and form, are instantiations of independent constructions.

**(29)** We swam. ~ We had a swim.
**(30)** He walked. ~ He took a walk.

The status of these sentences as highly marginal members of the transitive construction is shown by the fact that passivization is scarcely possible:

**(31)** *A swim was had.
**(32)** *A walk was taken.

Again, not all intransitive verbs have transitive equivalents of the form empty verb-plus-deverbal nominal. There is no *to have/take/make/do a death* alongside *to die*.

There also exists in English the possibility of encoding a three-participant event as a transitive sentence, through the incorporation of the patient into the verb. Thus, in (33), a locative, and in (34), a benefactor, come to function as patients:

**(33)**     He laid a carpet in the room. →
             He carpeted the room.

**(34)**     The Government provided houses for the squatters. →
             The Government housed the squatters.

Again, the phenomenon is sporadic, rather than fully productive. Not all benefactors and locatives can be promoted to patient through incorporation of the direct object into the verb:

**(35)**     He installed windows in the house.
             *He windowed the house.

**(36)**     He provided money for the orphanage.
             *He moneyed the orphanage.

The idiomatic nature of the phenomenon is apparent in (37), with respect to the relative acceptability of (a) and (b) in contrast to the ungrammaticality of (c) and (d):

**(37)** a.  He wined the guests.
         b.  He champagned the guests.
         c.  *He beered the guests.
         d.  *He coffeed the guests.

The encroachment of the transitive construction shows up again in the alternative ways of encoding three-participant events involving the transfer of a patient to a recipient. Usually, either patient or recipient can function as direct object:

**(38)** a.  John gave the book to Mary.
         b.  John gave Mary the book.

That both *the book* and, respectively, *Mary* function here as direct object is shown by the passive counterparts in (39):

(**39**)  a.  The book was given to Mary.
   b.  Mary was given the book.

Often, the same choice exists with more abstract instances of transfer:

(**40**)  a.  He showed the pictures to the children.
   b.  He showed the children the pictures.

With some verbs of transfer, however, the alternative encodings are not available. Which verbs admit the recipient as direct object would appear to be a matter of idiom. In many dialects, (41b) is ungrammatical:

(**41**)  a.  He explained the problem to the class.
   b.  *He explained the class the problem.

Sometimes the recipient can even stand as direct object without mention of the patient:

(**42**)  Give me! Show me!

With these last examples we are approaching the outer limits of the transitive construction. The acceptability of such sentences appears to be crucially dependent on the mood of the sentence and the context in which it is uttered. The imperative forms in (42), spoken in the presence of the objects which would normally function as the patients of the verbs, are more acceptable than the past tense reports: *John gave me*, ?*Mary showed me*. (These latter sentences seem incomplete: What was given/shown?) It is here, also, that one encounters considerable between-speaker variation—another symptom of the highly marginal status of the examples within the construction. Some speakers accept the transitive sentence *I'll write you*, others insist on *I'll write to you*. Even so, *I'll write you* seems better, to me at least, than the past tense report *John wrote Mary*.

The above discussion has shown how, in special cases, NPs referring to very unpatient-like entities can function as the direct object of a transitive clause. Subjects with unagent-like properties are no less frequent. We have already seen how forces, experiencers, and stimuli can stand as subjects. Also unproblematic, in English, are sentences with the names of institutions as subjects. In such cases we can say that the name of the institution is being used metonymically for the human agent who holds an important position in the institution:

(**43**)  This hotel forbids dogs.

A relation of metonymy between an agent and the instrument he uses to affect the patient similarly sanctions the use of an instrument in subject position:

(**44**)  The key opened the door.

Even further removed from the prototypical agent are subjects which designate the scope, or setting of an event:

(**45**)  a.  My guitar broke a string.
      b.  The stove has blown a fuse.

Sometimes the scope subject almost has the role of a locative or temporal:

(**46**)  a.  This tent sleeps six.
      b.  The room seats 500.
      c.  The fifth day saw our departure.

With these last examples, we have again approached the outer limits of the transitive construction. Symptomatic of the highly marginal status of (45) and (46) is the extremely low productivity of the construction with scope subjects. On analogy with *My guitar broke a string*, we cannot say, *\*The window cracked a pane*. Alongside *The tent sleeps six*, we do not have *\*The house lives four*, nor can we say, on the model of *The fifth day saw our departure*, *\*Midnight heard the explosion*, or *\*Spring experienced his return to health*. Furthermore—and this is a property already noted in connection with (42)—the acceptability of these highly marginal sentences seems to be affected by the tense, aspect, and polarity of the verb, and by the number and specificity of the NPs. *All these tents have been sleeping six* and *May the fifth day see our departure* are both decidedly odd. Even *The key won't open the door* seems better than *The key opens the door*.

## 12.6  Metaphorical extension of syntactic constructions

Metaphor, as we saw in Chapter 7, is one of the principal means of category extension. Our earlier discussions of metaphor were restricted mainly to the meanings of lexical items. The question arises whether metaphor also motivates the semantic extension of a syntactic construction. Halliday, for one, explicitly deals with sentences like *The fifth day saw our departure* in terms of grammatical metaphor (1985: 321 ff.)—an approach endorsed by, amongst others, Dirven (1985). In this section, I would like to examine more closely the validity of this view. What exactly is meant by saying that non-central transitive sentences like *He swam the Channel*, *I took a walk*, *They carpeted the room*, *My guitar broke a string*, are metaphorical?

I have characterized metaphor as a process whereby one domain of experience is conceptualized in terms of another. To say that the transitive construction undergoes metaphorical extension would be to claim that the agent-action-patient schema, characteristic of transitive events, gets projected on to states of affairs which are not inherently transitive. These states of affairs thereby come to be conceptualized in terms of an agent consciously acting in such a way as to cause a change in state in a patient. Some non-central transitive sentences certainly lend themselves to this kind of interpretation. The slogan of the pro-gun lobby, *Guns don't kill people, people kill people*, gets its effect precisely by denying the implication that, because *guns*

can stand as the subject of the transitive clause *Guns kill people*, guns therefore participate in the killing of people as consciously acting, responsible agents. Further indirect evidence for the power of the grammatical metaphor comes from a paper by Coleman (1980), which documents some characteristics of the speech of born-again Christians. The speakers studied by Coleman denied the full agency of human beings; people's actions, they believed, are ultimately God's work. This belief was reflected in the systematic avoidance of transitive sentences with first-person subjects. Sentences of the form *I did X* tended not to occur. Instead, circumlocutions like *I was led to do X* and *I was enabled to do X*, were preferred.

For other, more marginal transitive sentences, the metaphorical application of the transitive schema seems less appropriate. It does not, on the face of it, make much sense to say that *We had a swim* encodes a conceptualization of a state of affairs in terms of a consciously acting agent ('we'), whose action (that of 'having') causes a change in state in a patient ('a swim'). Neither is 'our departure' in any way affected by the action of 'seeing' on the part of 'the fifth day'. But if the use of the transitive construction does not always project the full agent-action-patient schema on to a situation, the choice of a transitive encoding might nevertheless serve to attribute selected aspects of prototypical transitivity to an otherwise non-transitive state of affairs. Indeed, the only partial applicability of the transitive schema would in itself point to a less central status within the construction. To the extent that a transitive clause encodes a state of affairs which is only partially compatible with prototypical transitivity, that clause will have the status of a more marginal member of the category.

We may note, to start with, that transitive clauses are rarely synonymous with non-transitive wordings. *We had a swim* does not mean the same as *We swam*. *We had a swim* conceptualizes the activity as a temporally bounded event, in contrast to *We swam*, where the activity is (potentially) unbounded. Thus one may readily say *We swam for hours on end*, but not *\*We had a swim for hours on end*. In this respect, the transitive construction does impose one component of the transitivity schema, namely temporal bounding. A different component of prototypical transitivity, namely the adversative relationship between agent and patient, is involved in *He swam the Channel*. In contrast to *He swam across the Channel*, where *across the Channel* merely denotes the path of the swimming, *He swam the Channel* presents the Channel as a challenge to the swimmer's prowess. (It is along these lines that we may account for the oddity of *She swam our new swimming pool*.) To take another of our earlier examples: *He carpeted the room* focuses on the status of the room as the affected entity. We would probably infer that the whole of the floor was covered with the carpet, and in this respect the room ends up in a different state, a state, moreover, which is salient to an observer. *He laid the carpet in the room* presents the carpet as the affected entity, and implies nothing about how the room was thereby affected, or how it looked to an observer.

Particularly interesting in this context is (47), in which the subject NP refers to what looks like the patient of the action, not the agent:

(**47**)  The book sold a million copies.

Clearly, this sentence is a highly marginal example of the transitive construction. Passivization is impossible (*_A million copies were sold by the book_), and seemingly analogous sentences with _buy_ (*_The book bought a million copies_) are also ungrammatical. The availability of a transitive encoding in (47) appears to depend on the fact that certain aspects of agency can be attributed to the subject (van Oosten 1977). This is not to say that the book is construed as a full-fledged agent; the book does not act volitionally and consciously, it does not by its actions effect a change in state of another entity. The true agent, in the act of selling, can only be the person who sells. Yet the seller does not have complete control over the act of selling. A successful sale depends, in no small measure, on the attributes of the thing that is sold. (47) seems to highlight the contribution of the merchandise itself (e.g. the fact that the book appeals to a wide audience) to the high sales figures. An analogous sentence with _buy_ is not possible, precisely because the act of buying is to a much greater extent under the control of the buyer. Similar arguments to these have been used by Schlesinger (1981) in connection with the only limited productivity of the transitive construction with an instrument in subject position. _The key opened the door_ is acceptable, since the successful opening of a door depends, in large part, on properties of the key. In contrast, *_An ivory baton conducted the symphony_ is bizarre, since conducting a symphony is the responsibility of the conductor, the properties of the baton play no part in the event.

The reader may well be wondering which aspects of prototypical transitivity sanction the use of the transitive construction in _The fifth day saw our departure_. In fact, practically the only commonality between this sentence and more central members of the category is the status of the subject as sentence topic: the fifth day is what the sentence is about. The absence of any other aspects of prototypical transitivity is in itself symptomatic of the extreme marginality of the sentence.

## 12.7  A comparison with German

Evidence for the essential correctness of the prototype view of constructions comes from a rather unexpected source, namely from cross-language comparisons. We can hypothesize the following situation. Two languages, _A_ and _B_, each have a construction whose semantics—at least with regard to the central instances—are very similar. In language _A_, the construction has undergone considerable extension, in _B_ the construction is restricted to cases which are fairly close to the prototype. Consequently, all instantiations of the

construction in *B* will have syntactically comparable translation equivalents in *A*; the converse will not hold. Furthermore, the lack of correspondence between *A* and *B* will not be random; only the more marginal members in *A* will not have direct translation equivalents in *B*. Such a situation exists with regard to the transitive construction in English and German. English is remarkable for the extent to which the construction has undergone extension. The transitive construction in German is much more restricted. As Hawkins (1986) amply documents, a transitive sentence in German requires, for its nominative-case subject, an NP with fairly typical agent properties; similarly, the accusative-case direct object must be a fairly typical patient, while the verb must denote a fairly typical action. Thus, only the more central members of the English construction have transitive equivalents in German. Some of the differences with regard to the less central members of the English construction may be summarized as follows:

(a) English readily encodes the experiencer of a mental state as a transitive sentence subject. In German, the experiencer often appears in the dative case, with stimulus as subject, rather as in Old English (cf. (23)):

(**48**)     Mir gefällt Maria.
        "to me (DAT) pleases Maria (NOM)", i.e. "I like Maria"

(b) If the agent-patient relationship is 'cooperative' rather than adversative, the patient in German may appear as a dative object, rather than as an accusative object:

(**49**)     Er half mir; Er antwortete mir
        "He helped me (DAT)"; "He answered me (DAT)"

(c) The transitive construction is not possible in German if the agent performs some action on his own body, i.e. agent and patient are not maximally differentiated:

(**50**)     Er hat sich die Zähne geputzt.
        "He brushed to himself (DAT) the teeth", i.e. "He brushed his teeth"

(d) If the patient does not undergo any change in state as a result of the action of the agent, the verb in German is sometimes reflexive, and the patient may appear in a case other than the accusative:

(**51**)     Ich erinnere mich seines Namens.
        "I remember myself (ACC) of his name (GEN)", i.e. "I remember his name"

(**52**)     Ich näherte mich der Stadt.
        "I neared myself (ACC) to the city (DAT)", i.e. "I approached the city"

(e) Under no circumstances can German encode a recipient—cf. (42)—with an accusative object:

(**53**)    *Zeig mich!; *Gib mich!
"Show me (ACC)"; "Give me (ACC)"

(f) In a limited number of lexically specified cases, transitive sentences are possible in German through the omission of a preposition (54), or through object-incorporation (55). In such cases, the verb requires a special transitivizing prefix:

(**54**)    Wir wohnten im Hause. → Wir bewohnten das Haus.
"We lived in the house" → "We lived-in, i.e. inhabited, the house (ACC)"

(**55**)    Er machte Bilder für das Buch. → Er bebilderte das Buch.
"He made pictures for the book", "He pictured, i.e. illustrated, the book (ACC)"

(g) German does not, in general, permit instruments to function as subjects:

(**56**)    ?Der Schlussel öffnete die Tür.
"The key opened the door"

(h)  Not even institutional agents are possible:

(**57**)    *Das Hotel verbietet Hunde.
"The hotel forbids dogs"

(i)  Finally, it should come as no surprise that sentences at the very limit of the English construction have no transitive equivalents in German:

(**58**)    *Das Zelt schläft sechs.
"The tent sleeps six"

## 12.8 Concluding remarks

In generative grammar as outlined in Section 11.2, the constructions of a language are the output of transformational rules which operate on initial phrase markers, which in turn are the output of the categorial rules of the base. On this view, knowing a construction means, basically, knowing the rules which generate it. On the constructionist account, constructions are not generated, they are individually learnt as pairings of formal conditions with a semantic specification. Also included in the knowledge of a construction is a measure of the construction's productivity, as well as an indication of its formal and semantic relationships with other constructions.

In principle, the generative model foresaw only fully regular rule applications, and hence, only fully productive constructions. Yet it is doubtful

whether any construction in a language is ever *fully* productive, in the sense that all lexical items which satisfy the formal requirements of the construction can be inserted with equal facility into the construction slots. It may well be possible to represent certain formal characteristics of the transitive construction by means of the phrase structure rules S → NP VP; VP → V NP. Yet not every random combination of NPs and V produce equally acceptable transitive sentences. It was therefore necessary to limit the power of phrase structure and other rules, by drawing on devices like subcategorization and selectional restriction. Ultimately, this kind of information resided in the lexicon. It is significant that over the last 30 years, starting with Chomsky (1972), Chomsky has sought to reduce more and more the role of phrase structure and transformational rules, and has correspondingly increased the role and the scope of the lexicon. In this, Chomsky appears to be approaching the position where the permissible constructions of a language are nothing other than generalizations over properties of lexical items. What is missing in this approach is the contribution of constructions themselves to the acceptability of linguistic expressions. As argued in this chapter, the transitive construal of a state of affairs that is encoded in a transitive clause may not be a property of any individual lexical items in the clause, but rather of the transitive construction itself.

## Study questions

**1.** In what ways do the following sentences diverge from the prototype of the transitive clause?

I lost my way.
I cut my finger. (Note that this can be interpreted as an intentional or accidental event)
The fire quickly warmed the room.
The fire quickly destroyed the building.
We followed the instructions.
I fear the consequences.
The consequences frighten me.

Apply to these sentences some of the tests for transitivity which were mentioned in the text, e.g. (i) the possibility of embedding the clauses under *persuade*, (ii) the possibility of using a clefting construction of the kind *What X did was . . .* and *What happened to Y was . . .*, and (iii) the availability of a passive counterpart.

**2.** Prenominal possessives can often be reworded by means of an *of*-phrase. Corresponding to *the company's president*, we have *the president of the company*. Yet the two wordings are not always available:

my car                    *the car of me
*the year's man           the man of the year

Sometimes, both wordings are available, but with subtle semantic distinctions:

my photograph (various readings, as discussed in the text)
the photograph of me ("the photograph which depicts me")
Chomsky's students ("students who have studied under Chomsky")
students of Chomsky ("people who study Chomsky's works")

These facts suggest that the prenominal and the *of*-construction, though similar in meaning, are not semantically identical. How can the semantics of the two constructions be characterized?

**3.** What are the grounds for claiming that the following expressions exemplify a special construction, which is distinct from the [NP of NP] construction exemplified by *the president of the country*, *a neighbour of a friend*?

a beast of a problem
an angel of a girl
that fool of a man
that clown of a lecturer
this genius of a child

Characterize the formal and semantic aspects of the construction. Could there be reasons to claim that the first nouns in these expressions (*beast*, *angel*, etc.) constitute a lexical category of their own, distinct from traditional categories such as noun and adjective? Explain the oddness of the following:

*a skyscraper of a building (in the sense "the building is a skyscraper")
*a paperback of a book
*that professor of a man
*that man of a professor
*this doctor of a woman

**4.** On the basis of the following examples, what are the grounds for recognizing a special *way*-construction in English? Consider such matters as the overall meaning of the sentences, the semantic contribution of the verb, whether the direct object nominal (with *way*), or the directional prepositional phrase, can be omitted, and whether the verbs would normally subcategorize for a directional prepositional phrase.

I made my way to the exit.
I elbowed my way to the doorway.
I lied my way through the interview.
He bought his way into the exclusive club.
The government tried to spend its way out of recession.
We can't legislate our way out of the drug problem.

(The *way*-construction is addressed in Jackendoff 1990: 211–23, and Goldberg 1995.)

## Further reading

On idioms, see Nunberg *et al.* (1994), Jackendoff (1990: ch. 7), and Taylor (2002: ch. 27).

On constructions, see Fillmore *et al.* (1988), Goldberg (1995), Kay and Fillmore (1999), and Taylor (2002: ch. 28).

On possessives, see Taylor (1989, 1996*b*). Note that Taylor (1989) presents a prototype view of prenominal possessives, while Taylor (1996*b*) focuses more on the schematic meaning which unifies the different uses of the construction.

# Prototype Categories in Phonology

In this chapter I discuss a topic of crucial importance for the coherence of the thesis presented in this book, namely the possibility of attributing non-classical structure to phonological categories. I drew attention in Section 2.3 to the role of the structural analogy assumption in twentieth-century linguistic theory. According to this assumption, a linguist will expect the same kinds of structure to show up at different levels of linguistic organization. Now, taking a rather broad view of the recent history of linguistics, it is probably true to say that it was in the study of phonology that the modern discipline first came of age. There are many reasons why this should have been so. The sounds of a language can be observed in a way in which meanings and syntactic structures cannot; the number of phonological entities (e.g. phonemes and features) which need to be posited for any one language is small and manageable; moreover, in their study of sound systems linguists were able to draw on the findings of a well-established tradition of articulatory phonetics. Be that as it may, the descriptive apparatus worked out for phonology came to be applied to other areas of linguistic description, especially morphology and syntax, and somewhat later, semantics. As argued in Chapter 2, it was above all the success of the classical model in phonology, with phonological categories being represented in terms of a small set of binary atomic primitives, that encouraged the use of criterial features in the characterization of syntactic and semantic categories.

A striking characteristic of the cognitive linguistic approach has been that it

has reversed this pattern of development. Cognitive linguistics is associated, first and foremost, with an area of linguistic analysis which other schools of linguistics have tended to relegate to the periphery of their enquiry, namely semantics, more particularly, lexical semantics. Certainly, it was with regard to the meanings of lexical items (such as the prepositions) that the prototype model revealed its potential. The organization of this book has traced the application of this model to other areas of analysis, to bound morphemes like the diminutive, to the units of intonation, and to the formal elements of language description, such as parts of speech and syntactic constructions. There remains the area of phonology. It would be counter to the spirit of the structural analogy assumption if the units of phonology needed to be categorized according to principles unique to this level of analysis. Indeed, such a state of affairs would seriously threaten the status of the prototype model as a valid alternative to classical models of linguistic categorization.

In our treatment so far we have not totally neglected phonological matters; see the account of intonational categories in Chapter 10. The discussion in Chapter 10 emphasized the analogies between the categories of intonation analysis and other meaning-bearing elements of language. In this respect, intonational categories are untypical of phonological categories more generally. Phonology is concerned, primarily, with the patterning of elements which are in themselves meaningless. To what extent is it feasible and, more importantly, insightful, to attribute prototype structure to these kinds of elements?

## 13.1  Phoneme categories

The salient aspects of the classical approach to the phoneme were reviewed in Chapter 2. Phonemes, as we saw, were characterized in terms of a conjunction of primitive, abstract features; furthermore, with its focus on the relations between categories, and on the value of categories within the phonological system as a whole, classical phoneme theory tended to disregard the concrete phonetic instantiations of the categories. For a valuable antidote to this approach, we cannot do better than turn to Daniel Jones's characterization of the phoneme. A phoneme, Jones wrote at the beginning of the last century, can be described as

a family of sounds consisting of an important sound of the language (generally the most frequently used member of that family) together with other related sounds which "take its place" in particular sound-sequences or under particular conditions of length or stress or intonation. (Jones 1964: 49)

It will be appreciated that this definition, with its reference to a family of sounds which are related in some way, is immediately suggestive of a proto-type approach. Let us consider a case in point. The /t/ phoneme in English

constitutes a category made up of a large number of members, the so-called allophones of /t/.[1] Amongst these, we can list the following:

(a) In onset position[2] in a stressed syllable, /t/ is articulated as a voiceless aspirated alveolar plosive: [tʰ].

(b) With some speakers, the aspiration of /t/ is so heavy that the sound is affricated. This articulation may be represented as [tˢ].

(c) Both the aspirated and the affricated articulations may occur when /t/ is utterance-final. Alternatively, utterance-final /t/ may be unreleased: [t̚]. The sound is often unreleased when it is immediately followed by another stop consonant, as in *get Peter* [gɛt̚ˈpiːtə].

(d) In the coda position, /t/ may be glottalized, i.e. closure in the alveolar region occurs simultaneously with a glottal closure: [ʔt]. This pronunciation is especially frequent in southern England.

(e) If the glottal closure mentioned in (d) momentarily precedes alveolar closure, and if, furthermore, the /t/ is utterance-final and unreleased, the alveolar closure makes no audible contribution to the sound produced. In other words, post-vocalic, pre-pausal /t/ is heard as a glottal stop [ʔ]. The glottal stop pronunciation generalizes, especially in southern British English and some kinds of Scottish speech, to codas of stressed syllables, even when these are not utterance-final.

(f) In utterance-final position, /t/ may sometimes be articulated as an eject-ive [t']. The ejective articulation occurs when closure in the alveolar region occurs simultaneously with a glottal stop. The glottis is raised, compressing the air trapped between the glottis and the oral closure. The alveolar closure is then released, letting the compressed air escape. The ejective articulation may be heard in highly emphatic utterances like *What!?*.

(g) As a variant of (f), the ejective /t/ may even be affricated: [tˢ'].

(h) In onset position in an unstressed syllable, /t/ might be associated with reduced aspiration. Moreover, in unstressed environments, the degree of con-striction in the alveolar region might be reduced. In this case, /t/ is realized by an /s/-like fricative, which may be represented as [s̩]. The spirantization of /t/ is particularly common in rapid speech, in phrases like *Look at him* [əs̩ɪm].

(i) When it occurs between vowels, especially when the preceding vowel is stressed, /t/ may be articulated as a flap: [ɾ], as in *city*, *pretty*, *computer*. This pronunciation is especially common in American English; it is also becoming increasingly frequent in New Zealand English. Another possibility is a voiced articulation, i.e. /t/ is spoken as [d].

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[1] The following discussion develops a number of points in Nathan (1986).
[2] The onset of a syllable comprises the consonantal elements which precede the vocalic nucleus, while the coda consists of consonantal elements following the nucleus. See below, s. 13.2.

(j) In certain non-standard northern varieties of British English, an inter-vocalic /t/, especially if it follows a short stressed vowel, is pronounced as an approximant [ɹ]. Thus, *I've got to go* is heard as *I've gorra* [ɡɒɹə] *go*, and *Get up* as *Gerrup* [ɡeɹʊp]. The 'r'-variant is also common in the unmonitored speech of South Africans.

(k) In rapid, relaxed speech, an intervocalic, post-stress /t/ may even be elided. Thus one might hear *What's the matter* [mæː] *with you?*. In certain consonant clusters in a syllable coda, elision of /t/ is probably the norm, e.g. *prints* [prɪns].

(l) The place of articulation can vary. A dental articulation [t̪] is likely before a dental fricative, as in *eighth*. Before /r/ a more retracted articulation is common, as in *trip*—an articulation which comes close to that characteristic of the affricate [tʃ].

(m) Utterance internally, /t/ may be released in different ways, depending on the characteristics of the following sound: nasal release before a nasal (*mutton*), lateral release before a lateral (*little*).

(n) /t/ obligatorily loses its characteristic aspiration in the syllable-initial cluster /st/, as in *stop*, *step*, etc. As already mentioned, loss of aspiration is also common if /t/ constitutes the onset of an unstressed syllable.

Before turning to the way the members of the /t/ phoneme are structured, a few preliminary remarks are called for. It will be observed that in listing the members of the /t/-family of sounds, I have referred to different regional varieties of English (southern British, American, South African). I have also included examples from different stylistic levels (rapid, emphatic). This reflects the view that there is no such thing as a 'completely homogeneous speech community' (Chomsky 1965: 3). While Chomsky's idealization might perhaps be justified in certain kinds of syntactic analysis, as a basis for describing a speaker's phonological ability it goes counter to even the most superficial observation of speech behaviour. Every speaker of a language commands a range of stylistic variants, and most speakers have at least a passive knowledge of different regional accents. Speakers, therefore, usually have little difficulty in correctly categorizing sounds which they themselves might not use in their own speech. We should also be careful not to identify certain articulations as being unique to certain regional accents. With the possible exception of the flap, all the articulations listed above are employed, some perhaps not very frequently, by the present writer, a native of the north-east of England who speaks in formal situations a reasonably close approximation to standard British English.

It will also be noted that certain sounds have *not* been included as members of /t/. These are sounds which replace /t/ in certain morphological environ-ments. For instance, the /t/ of *president* is replaced by /ʃ/ in the adjective

*presidential* and by /s/ in the abstract noun *presidency*. The exclusion of [ʃ] and [s] as members of /t/ is in line with the distinction between what Bloomfield called 'automatic' alternations and 'non-automatic', or 'grammatical' alternations (Bloomfield 1933: 211 ff.), i.e. between phonological alternations proper, and morphophonological alternations. Non-automatic processes, such as the /t/-/ʃ/ alternation in *president-presidential*, are sensitive to the morphosyntactic structure of a linguistic form. Purely phonological alternations, on the other hand, reflect exclusively prosodic aspects of an utterance, i.e. such things as the phonetic environment of a segment, its position in a syllable, the position of the syllable relative to pauses, the degree of stress of the syllable, as well as speech style and speaking tempo.[3]

Let us now turn to the structuring of the sounds which make up the /t/ phoneme. Particularly striking are certain analogies with the family resemblance structure of semantically polysemous items (Chapter 6). Just as there are no criterial semantic features common to all the meanings of *climb* and *over*, so there are no phonetic features which unify all the members of the /t/ phoneme and which jointly distinguish the /t/ phoneme from contrasting phoneme categories. English /t/ would normally be described as a pulmonic voiceless alveolar stop. Yet some allophones of /t/ are voiced, pulmonic airstream mechanism is absent in the ejectives, dental and glottal articulations defeat the characterization alveolar, and not all members of /t/ are stops. Symptomatic of this state of affairs—and again the parallelism with the meanings of polysemous forms will be apparent—is the fact that some allophones of /t/ have practically nothing in common, phonetically, with others. Consider in this regard the [s̱]-articulation and the glottal stop allophone, or the 'r'-variant and the ejective.

Continuing the analogy with polysemous categories, it is possible to establish chaining relationships on the basis of phonetic similarity between individual members of /t/. A suggested chaining network is given in Fig. 13.1. One chain starts with the aspirated variant. The aspiration in [tʰ] may take on an s-like quality in the affricated variant [tˢ]. If the /t/ fails to be associated with complete alveolar closure, the result is a kind of sibilant [s̱]. Another chain of variants is associated especially with intervocalic position after a stressed vowel, as in *better*. The stop may be voiced [d]; it may be flapped [ɾ]; or it may come out as an approximant [ɹ]. Yet another chain is associated with coda position, especially if pre-pausal. The consonant may be unreleased [t̚], or it may be glottalized [ʔt]. If the alveolar closure fails to materialize, the consonant is articulated as a glottal stop [ʔ]. If the alveolar closure is released while glottal closure is held, we get the ejective [t'].

Note that the network depicted in Fig. 13.1 is meant to illustrate how the

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[3] Generative phonologists, as represented by Chomsky and Halle (1968), strove to minimize this distinction, by trying to handle phonological and morphophonological alternations within the same component of the grammar. Thus, the phonological component derived a surface phonetic representation from a unique underlying representation of each morpheme.

**Fig. 13.1.** A network for allophones of /t/.
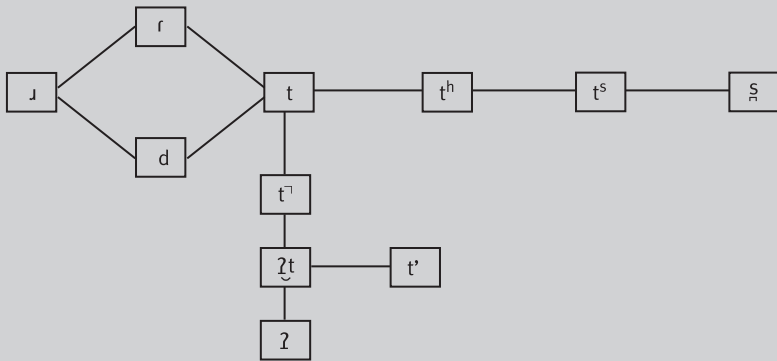
different allophones of /t/ might be related on the basis of the phonetic similarity between adjacent items. The network, in other words, tries to make explicit the phonetic motivation for the association of this particular set of sounds within a single category. The network does not necessarily correspond to the historical expansion of the category from some putative 'original', or 'central' phonetic value, nor does it pretend to represent the sequence in which the various allophones are acquired by the child language learner. It will be recalled that these are exactly the kinds of issues that were raised in connection with network accounts of polysemous semantic categories.

As a final point of comparison with semantic categories, it will be observed that the /t/ phoneme, in some of its instantiations, encroaches on the phonetic space of other phoneme categories. We have encountered analogous instances of category overlap in earlier chapters, e.g. the encroachment of *over* on the semantic space of *across*. The glottal stop realization of /t/ overlaps, in some dialects, with the glottal stop allophones of /p/ and /k/; thus, for some speakers, *boot* and *book*, *pip* and *pit* are homophones. The flap is a possible instantiation of both /t/ and /d/; thus, some American speakers do not distinguish *rider* and *writer*, *latter* and *ladder*. Finally, the [ş] allophone encroaches on the phonetic space of the /s/ phoneme, while the 'r' variant of /t/ is phonetically identical with the principal member of the /r/ phoneme.

The similar structure of phoneme and semantic categories prompts, in the case of phoneme categories, the very same questions as were raised in connection with polysemous items (cf. Section 6.4). Are there limits on the extension of a phoneme category? Do certain members of the category have a central status, and if so, on what basis? And what motivates the extension of the category in the first place? As regards the first question, we might suppose, as we did in the case of semantic categories, that the extension of a category will

be constrained by the presence of neighbouring categories. In general, this principle seems to hold—most members of the /t/ phoneme do not in fact trespass on the phonetic space of other categories. Yet some do—cf. the examples of overlap discussed above. As was the case with polysemous categories, the principle of category distinctiveness, intuitively appealing as it is, fails as an absolute constraint on category extension.

The second question concerns the centrality of certain members of the category. Daniel Jones, it will be recalled, suggested frequency of occurrence as a decisive factor. I have no data on the incidence of the different allophones of /t/, averaged over different speakers for different speaking styles and speaking rates. As was the case with prototypical members of semantic categories (cf. p. 56), the impression of a higher frequency of the central allophone—say, the voiceless alveolar stop—may well be a consequence of its central status, and not a defining characteristic of it. There are two other approaches to this issue, one structuralist, the other psychological. Structurally, we can understand centrality in terms of the relations between categories and of the internal structure of the categories. In this respect the central members of phoneme categories are akin to the central members of basic level categories (see Section 3.3). Although the referential range of basic level terms might overlap, the central members of the categories are kept perceptually and cognitively maximally distinct. In a similar way, the putative central member of /t/—the voiceless alveolar plosive, let us say—enters into a number of highly salient perceptual and articulatory contrasts with the putative central members of neighbouring categories, such as the voiced alveolar plosive of /d/, the voiceless velar plosive of /k/, and so on. Furthermore, the centrality of the [t] allophone is confirmed by the fact that the chaining relationships between the members of /t/ do seem to radiate out from this central member.

If the structuralist approach to centrality is more in keeping with the ideas of Saussure, Trubetzkoy, and Jakobson, the psychological approach harks back to Sapir. For Sapir, the phoneme was a unitary mental entity, allophonic variation being the effect of subconscious adaptations of a speaker's intentions to the phonetic environment in which a speech sound occurs (1970: 55 f.). As a consequence, phonetically naïve speakers are usually unaware of the extent of allophonic variation in their language; in general, they perceive phonetically distinct allophones as being the 'same sound'. Needless to say, the psychological and the structuralist approaches are not necessarily in conflict. It is quite plausible to maintain that a speaker's mental image of /t/ as a voiceless alveolar plosive reflects the structural properties of the category in question. The mentalistic approach, however, does provide a starting-point for explaining the process of category extension, to which we now turn.

In studying extension of semantic categories, we referred to two very general cognitive processes, namely metonymy and metaphor (Chapter 7). It was through metonymy that *over the mountain* can designate either a path or a place, and through metaphor that *high* can refer to the spatial dimension or to

institutional status (*a high building* vs. *a high position in a company*). We also pointed out that metaphor might well be involved in the meanings of some phonological categories, such as rising/falling pitch, and high/low key (Chapter 10). But with respect to the membership of a phoneme category, these notions are hardly likely to be relevant. We need to appeal to some other kind of cognitive processes in order to motivate the extension of the /t/-category to include the variants depicted in Fig. 13.1.

Suggestions as to the nature of these processes may be found in the theory of **natural phonology**. The basic thesis of natural phonology is that the sound patterns of a language 'are governed by forces implicit in human vocalization and perception' (Donegan and Stampe 1979: 126). Just as cognitive linguistics rejects the notion of an autonomous faculty of language and attempts instead to ground the structure of language in more general processes of cognition and conceptualization, so natural phonology argues against the thesis that human beings are born with a specialized phonological competence, in the sense of the generativists. Rather, from their earliest age, human beings apply to their vocalizations a set of universal natural processes which derive, as the above quotation indicates, from universal facts of articulation and perception. The phonological system of a language, it is proposed, results from the suppression of some of these natural processes and the exploitation of others, together with the imposition of a set of non-natural, language-specific rules. These latter correspond, in the main, to the non-automatic morphophono-logical alternations referred to earlier. Morphophonological alternations have various sources. Very often, they are the result of the telescoping of several individually natural processes, whose combined effect is no longer natural. As a consequence, morphophonological rules have a very different cognitive status from the natural processes which constitute the proper object of phono-logical enquiry. Morphophonological processes, such as the replacement of /t/ by /s/ in *president* ~ *presidency*, simply have to be learned as such by the language user.

Donegan and Stampe (1979: 142 f.) draw attention to two particularly important natural processes, and both are operative in the extension of the /t/ category. These are **fortition** (or strengthening) and **lenition** (or weakening). Fortitions serve to make a segment perceptually more prominent. This aim can be achieved by increasing the acoustic energy associated with the segment, by exaggerating the phonetic characteristics of a segment, by increasing the phonetic distance between the segment and adjacent segments, or by maximizing the contrast with other categories in the system. In English, fortition processes apply especially in stressed syllables—indeed, the extra energy associated with stress prominence makes stress a fortition process *par excellence*. Accordingly, it is the /t/s in the onsets of stressed syllables which are particularly liable to be heavily aspirated, and the /t/s in the codas of stressed syllables which are likely to be glottalized. Aspiration and glottaliza-tion each emphasizes, in different ways, the contrast between the voicelessness

of /t/ and the voicing of an adjacent vowel, as well as the contrast between the voicelessness of /t/ and the voicing of /d/. Aspiration interposes an /h/-like segment of highly audible noise between the stop and the vowel, while glottalization abruptly cuts short the vocal fold vibration of the vowel. The syllable-final ejective articulation, being based on a glottal air-stream mechanism, may also be regarded as the consequence of a fortition. Lenition processes, on the other hand, downplay the characteristics of a segment, by reducing the articulatory distance between the segment and an adjacent segment or the contrast with other elements in the system. Lenitions occur, typically, in unstressed syllables, as well as in casual, inattentive, and allegro speech styles. Symptoms of lenition are the spirantization of /t/ (the speech organs fail to achieve complete closure), voicing in intervocalic position (the speaker fails to interrupt voicing at the vocal folds), flapping (the speaker merely initiates a ballistic movement of the tongue rather than carefully coordinating the movement of the tongue with the offset and onset of voicing), and the approximant [ɹ] variant. The glottal stop articulation may be seen as the consequence of a lenition process (the elimination of an oral closure) applying after a fortition (glottalization) has taken place. The ultimate lenition process, of course, is elision.

## 13.2 The gradience of phonetic features

In the preceding section I examined in some detail the internal structure of a phoneme category in English. The discussion showed that the family of sounds comprising the phoneme category cannot be characterized in terms of a conjunction of categorial features. There still, however, remains the possibility of a feature-based definition of some abstract representation of the category. I would now therefore like to reappraise the status of features which characterize a speech sound. As was pointed out in Chapter 2, the classical model of categorization rests on the assumption that a given feature either is or is not present in any particular instance, and that features, either singly or in combination, define clearly circumscribed classes of sounds, i.e. those that possess the feature(s) in question, and those that do not. The class of voiced sounds, for example, all possess the feature [+VOICE], while the complementary class of voiceless sounds are characterized by [−VOICE].

The basis for this kind of clear-cut distinction between classes of sounds has been questioned by Jaeger and Ohala (1984). Jaeger and Ohala trained groups of phonetically naïve speakers of English to classify the initial sounds of English words according to the parameters [+ANTERIOR], [+SONORANT], and [+VOICE]. In a subsequent testing session, subjects were required to categorize the initial sounds (some of which had not been presented during the training sessions) of English words according to the relevant parameter. It was found that each of the three parameters appeared to define, not two mutually

exclusive categories (those with the feature, and those which lack it), but rather a continuum, the opposite ends of which constituted the best examples of the categories in question. Results for the voicing dimension are shown in (1). Of the sounds tested, /r, m, n/ were the best examples of voicing, while /p, t, k/ were the best examples of voicelessness. The so-called voiced stops /b, d, g/ turned out to occupy an intermediate position between voicing and voicelessness.

(1)

*most voiced*                                                              *least voiced*

/r, m, n/        /v, ð, z/        /w, j/        /b, d, g/        /f, θ, s, h, ʃ/        /p, t, k/

It would seem, then, that phonetic features may not be too different from the attributes which characterize semantic categories. Features are not so much binary classificatory devices, but merely embody dimensions of perceived similarity between different speech sounds.

Jaeger and Ohala, in a reference to Jaeger's doctoral dissertation (1980), claim that degree of membership in phonological classes, as illustrated in (1), is a relevant factor in such diverse areas as speech errors, memory confusions, similarity judgements, and language acquisition. Dissatisfaction with the binary classifications of the classical approach may be inferred from some other trends in phonology. Consider, for example, the treatments of vowels in dependency phonology. **Dependency phonology** (for an overview, see Anderson and Durand 1986, and Lass 1984: 271–95) postulates four components of vowel quality: |i| (i.e. frontness), |u| (backness), |a| (openness), and |ə| (centrality). The quality of any given vowel is represented by various admixtures of these components, and of the dependency relations which exist among them. Within this framework, vowels do not fall into mutually exclusive classes, e.g. those which are [+LOW] and those which are [-LOW], Rather, differences in vowel height are treated as a function of differences in the predominance of the |a| component. Dependency phonology has provided a particularly suitable model for the description of historical processes. For instance, the gradual raising of vowels over time—a rather common process of language change[4]—can be captured in terms of a gradual weakening of the |a| component. Needless to say, binary features are not at all suitable for the description of this kind of gradual process.

The gradience of phonological features is relevant to another area of phonology, namely syllable structure. Developments in **metrical phonology** have suggested that syllables in all languages conform to a universal syllable template (for a brief overview, see Lass 1984: 248 ff.). The template attributes to

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[4] The gradual raising of the long vowels characterized the so-called Great Vowel Shift, which occurred between Middle English and Early Modern English (roughly, between the death of Chaucer and the birth of Shakespeare). Raising of the front vowels also characterizes some present-day varieties of English, such as Australian.

syllables a constituency structure which mediates between the category symbol σ (= syllable) and the syllable's terminal elements, that is, the phonetic segments. (The analogy with the familiar phrase structure trees of syntactic analysis will be obvious.) All syllables consist of an obligatory **rhyme** optionally preceded by an **onset**. The rhyme consists of an obligatory **nucleus** followed by an optional **coda**. Each of the three elements—onset, nucleus, and coda—may itself branch, i.e. may consist of more than one terminal element. The universal template is represented in (2) where the solid lines indicate obligatory elements.

(2)
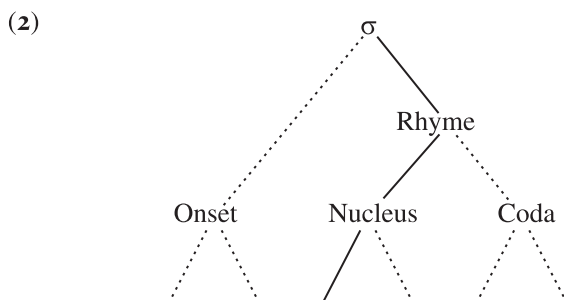


Not any random selection of segments is eligible for insertion into the terminal slots of (2). In any language, [pɑm] is likely to be a better syllable than [ptɑkr].[5] Underlying this judgement is a universal sonority hierarchy. The most sonorous sounds in a syllable occupy the nucleus position, while the sounds flanking the nucleus exhibit a progressive decline in sonority. The syllable template given in (2) can thus be elaborated as in (3).

(3)
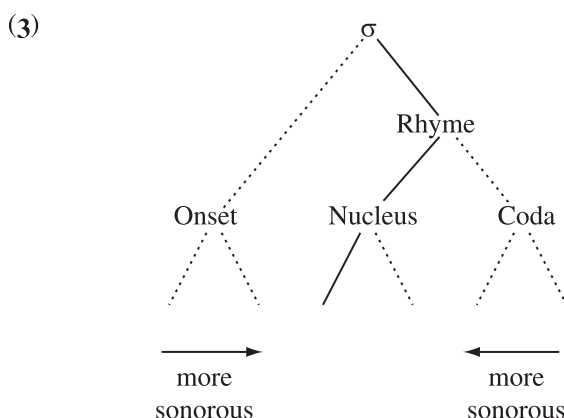


The notion of sonority, as used here, refines the well-known articulatory-acoustic characterization of the major phonological categories of vowel and consonant. As a parameter for the two-way classification of speech sounds,

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[5] Onset clusters like [pt] do occur in some languages, such as Russian (*pt'itsa*) "bird"), while coda clusters such as [kr] can occur in French (*fiacre* "cab"). But onset and coda clusters such as these are comparatively rare in the languages of the world.

sonority was already invoked by Daniel Jones. Two factors are involved. One has to do with voicing. All other things being equal, a voiced sound (in the light of the earlier discussion, we should perhaps say 'a sound which exhibits a higher degree of voicing') is more sonorous than a voiceless one. The other factor concerns the degree of constriction of the vocal tract. From this point of view, the most sonorous sounds—the ones with the greatest carrying power—are the vowels. Vowels are articulated with minimum constriction of the vocal tract: 'the air issues in a continuous stream through the pharynx and mouth, there being no obstruction and no narrowing such as would cause audible friction' (Jones 1964: 23). All other sounds, i.e. the consonants, being articulated with varying degrees of vocal tract constriction, exhibit lower degrees of sonority.

While sonority certainly makes possible a two-way classification of speech sounds into vowels and consonants, it will be clear that sonority is not a matter of either-or, but of more-or-less. As a class, vowels are more sonorous than consonants. But within the class of what we traditionally call vowels, some are more sonorous than others. The most sonorous of all—the most 'vowel-like', if one wishes—is the maximally open [ɑ], while the high vowels [u] and, especially, [i], are somewhat lower on the sonority scale. Similarly with the consonants. The least sonorous consonants are those which are voiceless and which are articulated with maximum constriction of the vocal tract, i.e. the voiceless stops. Progressively more sonorous are the voiced stops, the voiceless and the voiced fricatives, the nasal stops, the liquids, and the glides. Sonority relations are illustrated in (4):

**(4)**

*most sonorous ←                                    → least sonorous*

| low vowels | high vowels | glides | liquids | nasals | fricatives | stops |

Optimal instantiations of the syllable template have in the nucleus position a sound which is close to the sonorous end of the sonority continuum, i.e. a vowel. Indeed, in the overwhelming majority of cases, in English and other languages, a syllable consists, obligatorily, of a vowel, optionally flanked by progressively less sonorous consonants. But sounds which are somewhat lower on the sonority scale can also occupy the nucleus position. Syllabic /r/ occurs in some Slavic languages, such as Czech, Slovak, and Serbian, while syllabic nasals are common in Bantu languages. With respect to English, the possibilities are more limited. A number of cases can, however, be identified. In many dialects of English, /l/ and /n/ can function as syllabic nuclei, in certain environments: *mutton* [mʌtn̩], *little* [lɪtl̩]. Both of these words consist of two syllables, the second syllable however does not have a vowel as its nucleus, but the fairly sonorous nasal and lateral. A second class of cases occurs in fast speech, where the elision of an unstressed vowel may thrust a sound which is rather low on the sonority hierarchy into the nucleus slot.

Thus, the elision of the first schwa in *photography* [fə.ˈtɒ.gɹə.fiː] may result in the initial syllable of the word consisting solely of a syllabic /f/: [f̩.ˈtɒ.gɹə.fiː]. Lass (1984: 261) claims that in fast speech *university* [jʊː.nɪ.ˈvɜː.sɪ.tiː] may well retain its five syllables, with /n/ and /s/ functioning as nuclei in place of the elided vowels: [juː.n̩.ˈvɜː.s̩.tiː]. Thirdly, highly emphatic speech may lend nucleus status to certain non-vowel segments. The first syllable of *brilliant* would usually be [bɹɪ]; in emphatic speech the word may be pronounced [bɹ̩.ɹɪliənt], with the 'r' acquiring nucleus status. The final, and somewhat marginal class of cases concerns a small number of ideophone-like vocalizations. The attention-grabbing *psst!*, or the shivering *brr!*, may both be regarded as instantiations of the syllable template, the former having /s/ as its nucleus, while in the latter an extended approximant [ɹ] or trilled [r] functions as nucleus.

In each of these four cases, the possibility of a non-vowel occurring in nucleus position is subject to various restrictions. With the exception of the ideophones, the phenomenon is found only in unstressed syllables; syllabic /f/ in *photography* occurs only in fast speech; syllabic /r/ in *brilliant* is characteristic only of highly emphatic speech; syllabic /n/ and /l/ in words like *little* and *mutton* demand an unstressed environment following a stop. These very restrictions point to the marginal status of the phenomenon in question. As sounds get progressively less sonorous, their general availability for insertion into the nucleus slot declines.

In an earlier chapter (Section 3.2), I raised the question whether certain vowels may be considered better examples of the category than others. To the extent that the category is defined in terms of the binary feature [VOCALIC], the answer is clearly negative; all members of the category VOWEL necessarily have equal status. However, if we take sonority to be a defining attribute of vowels, vowels and consonants do not emerge as two clearly circumscribed, mutually exclusive classes. [ɑ] is indeed a more central member of the category than [i], while the glides, liquids, and nasals have a somewhat ambiguous status as vowel-like consonants (or consonant-like vowels). This example, together with the ones discussed at the beginning of this section, strongly suggests that the sounds of a language are to be categorized along substantially the same principles as other elements of linguistic structures. The fuzzy demarcation of vowels and consonants, of voiced and voiceless, of high and low, is exactly analogous to the absence of a clear boundary between words and clitics, words and affixes, nouns and adjectives (and between cups and bowls).

## 13.3 Syllable constructions

Let us now return to the syllable template given in (3). As already mentioned, the syllable template in (3) is claimed to have universal validity. However, different languages do not exploit to an equal degree the possibilities offered

by the universal template. Some languages, such as Māori, permit only open syllables of the form CV. Coda consonants are not allowed, neither are consonant clusters in onset position. Consequently, no more than one consonant can appear between vowels in the stream of speech, and every utterance must end in a vowel. Other languages, such as Italian, permit only a limited set of consonants to appear in coda position, and then only word internally. Whereas /karta/ and /kanta/ are possible (and indeed actual) words in Italian, /kapta/ is not, since /p/ is not permitted in syllable coda position.[6]

Within a given language, we may need to recognize a number of different syllable patterns, which constitute the major syllable types of the language. These syllable types may be regarded as phonological constructions, analogous in many ways to the syntactic constructions studied in Chapter 12. Like the formula for a syntactic construction, the formula for a syllable construction provides for a series of 'slots', and specifies the kinds of items which can fill the slots. In the case of syntactic constructions, items are available for insertion on the basis of their syntactic and/or semantic properties, in the case of syllables the relevant properties are phonetic. Consider, from this point of view, the fact that English, in common with some other Germanic languages, has some conditions on the structure of the syllable rhyme (at least, in stressed monosyllables). It is not the case that a syllable rhyme can consist of any vowel, followed by any number (including zero) of consonants. Thus, in stressed monosyllabic words, a long vowel or a diphthong (both may be represented by means of a branching nucleus) may be followed, either by an empty coda or by a coda consisting of one or (in some cases) more consonants. Short vowels in stressed monosyllables, on the other hand, must be followed by a filled coda; */bæ/, */be/, */bɪ/, etc. are unacceptable as English monosyllables. The condition is that the rhyme must contain at least one branching node; if the rhyme itself does not branch, then the nucleus must branch. Thus, (5a, b, c) constitute syllable constructions in English, whereas (5d) does not.

(5)  (a)

σ

Rhyme

Nucleus

V  V

(b)

σ

Rhyme

Nucleus  Coda

V  V    C

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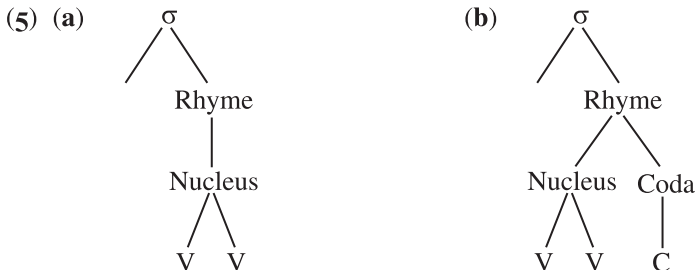
[6] Actually, the situation is more complex, in that /p/ is permitted in coda position if the /p/ is the first 'half' of a geminate, or doubled consonant, as in /kappa/, where the lengthened /p/ is split over two syllables. Also, some recent additions to the Italian lexicon, as well as some learned words, do testify to syllable-final plosives, e.g. *optare*, *optimum*. But the number of such examples is quite small.

**(c)**

```
            σ
          /   \
        Rhyme
        /    \
   Nucleus   Coda
      |        |
      V        C
```

**(d)**

```
          * σ
          /   \
        Rhyme
          |
       Nucleus
          |
          V
```
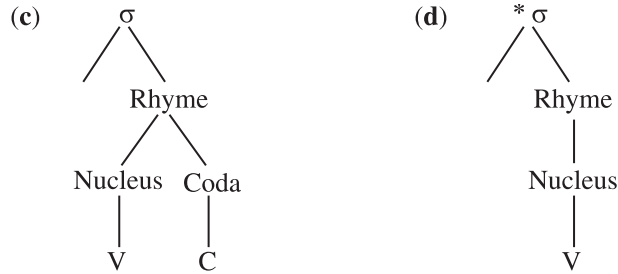
Consider next the possibility of there being more than one consonant in the syllable coda. Here again some interesting restrictions are found. After a short vowel, two or more consonants are unproblematic: *imp*, *lamps*, *sank*, *adze*, *bench*, etc. However, after a long vowel or diphthong, two or more consonants are permitted only if the second and any following consonants is a coronal. (Recall, p. 26, that coronal consonants are articulated in the alveolar or dental region, and include /s, z, t, d, θ, ð/.) While /ɪmp/ is a possible word in English, */iːmp/ is not. On the other hand, *fiend* /fiːnd/, and even *fiends* /fiːndz/, are allowed. It is interesting to note that the plural morpheme, the third-person singular verbal inflection, and the past tense morpheme—these are morphemes which may be attached to noun and verb stems—may be constituted by a single consonant, which happens in all cases to be coronal, i.e. /s, z/ or /t, d/. The somewhat less frequent derivational morpheme *-th*, which occurs in words such as *length* (from *long*), *strength* (from *strong*), and *fifth* (from *five*), is also a coronal, namely /θ/. Thus, the coda of a monosyllabic word can be readily 'extended' by the addition of these sounds, as in *imps*, *fiends*, *owned*, etc. A cluster of four consonants in the coda is even found in the word *sixths* /sɪksθs/. The situation is captured by means of the syllable constructions in (6). Here, I have placed the 'additional' coronal consonants in parentheses after the syllable constructions proper. This is to capture the fact that, in a sense, the final coronals do not 'count' when we assess the acceptability of a syllable. The generalization to emerge from (6) is that (disregarding final coronals), the syllable rhyme may branch only once. If the nucleus branches (as when the vowel is long, or a diphthong), only one coda consonant is allowed. Conversely, the coda may branch only if the nucleus does not branch.

(6)  **(a)**

```
             σ
           /   \
         Rhyme
         /    \
    Nucleus   Coda
       |       /\
       V      C  C   ( C ...      )
                      [+CORONAL]
```

**(b)**
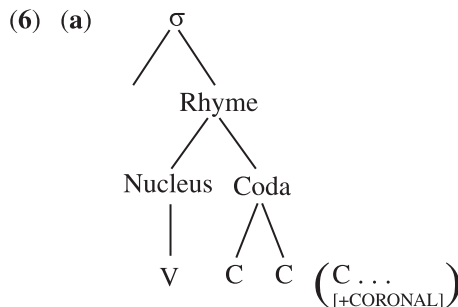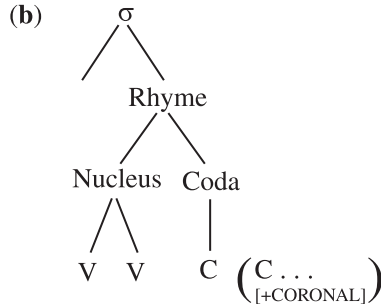


I have focused so far on syllable rhymes. Characteristics of syllable onsets can also be captured by means of onset constructions. For example, every three-consonant cluster in a syllable onset in English must conform to the schema [s + {p, t, k} + {l, r, w, j}]—the first consonant, that is, must be /s/, the second is one of /p, t, k/, the third is one of /l, r, w, j/. Examples include *spring*, *sclerosis*, *spew* /spjuː/, and *squeal* /skwiːl/. Another property of English syllables has to do with a general tendency to avoid syllables with empty onsets. Now, the requirement for syllables to have a filled onset goes against the fact that quite a few English words do not in fact begin with a consonant. Speakers therefore have to insert an initial consonant in order to satisfy the requirements of the syllable construction. One possibility is the use of the glottal stop. The word *Alan*, when spoken in isolation, would almost certainly commence with a glottal stop: [ˈʔælən]. The glottal stop may also be used, even when the word is embedded in the stream of speech. When the word is contextualized, however, other strategies may be employed. First, the final consonant of a preceding word can be recruited to fill the syllable onset; in *with Alan*, the onset of the initial syllable of the word is filled with the final /ð/ of *with*. Alternatively, if the preceding word terminates in a high vowel, either front, as in *by*, or back, as in *to*, the onset is filled with a glide, either /j/ or /w/. Hence, *to Alan* becomes [tuː ˈwælən]. If the preceding word terminates in a non-high vowel, the so-called 'linking r' is inserted. Hence *for Alan* may be pronounced [fɔː ˈrælən]. It should be mentioned that accents of English differ considerably with respect to which of these onset-filling strategies they adopt. South African English, for instance, strongly favours glottal stop insertion over glide and 'r' insertion. Moreover, some South African speakers have a further onset-filling strategy, which is probably unique to this accent. This involves the insertion of the so-called voiced (actually, breathy-voiced) 'h'. Thus, *create* may be heard, either as [kriːˈʔeɪt] or as [kriːˈɦeɪt].

In motivating a constructional account of syntax, I made much of the existence of idioms. Idioms show that the more general constructions in a language may not be able to account for the full set of expressions in a language. On the one hand, there may be 'minor' constructions, which are instantiated in only a small number of expressions, such as the construction

exemplified by *year in year out*. Typically, minor constructions are partially specified lexically, that is, some of the construction slots must be filled by specific lexical items. In the limiting case, a construction is fully specified lexically, that is, no lexical variation at all is possible, as with the introductory formula *How do you do?* Moreover, some words may be specifically tied to certain constructions. The lexical item *aback* is virtually restricted to occurring in the passive construction *be taken aback*.

Does a comparable state of affairs hold with respect to syllable constructions? The answer is yes. Interjections and ideophones are often phonologically deviant in some way. *Oink*—which represents the sound that pigs make— is deviant, in that a diphthong is followed by two non-coronal consonants. Just as *by and large* fails to be sanctioned by general phrase structure rules of English, so this syllable fails to conform with more general syllable constructions in the language. It can be regarded as a highly 'idiomatic' syllable. Similarly, the attention-grabbing *psst!*, or the shivering *brr!* can be thought of as one-member phonological constructions. Pursuing the analogy with syntactic constructions, we find that certain phonemes are restricted to occurring in certain constructional slots. To this extent, the velar nasal /ŋ/ of English is an 'idiomatic' phoneme, in that it may not freely occupy a consonant slot in a syllable construction. It may not, for example, occur in onset position, nor may it occur after a long vowel. It is analogous, therefore, to the lexical item *aback*, whose restricted distribution we have just mentioned. /h/ is likewise idiomatic, in that it can only occur in syllable onset position, and then, only in a stressed syllable.

In Chapter 12, I raised the possibility that the syntax of a language can be described in terms of a network of constructions, which vary with respect to their productivity vs. idiomaticity. A similar approach can be taken to the phonology of a language. To be sure, 'constructions' in phonology cannot be taken to be pairings of a formal and semantic specification; syllable constructions are essentially formal elements, which are meaningful only to the extent that the syllable happens to coincide with a word or morpheme of the language. A phonological construction is simply a schema for the manner in which smaller elements, such as segments, can be combined into larger configurations. With this proviso in mind, it seems entirely feasible that the syllable structures in a given language can be represented by means of a network of phonological constructions, with properties which are analogous, in many ways, to the syntactic constructions which comprise the syntax of a language.

## Study questions

1. Refer to Fig. 3.1 (p. 49). In this figure, TABLE, CHAIR, and BED constitute basic level categories, FURNITURE is a superordinate category, while DINING-ROOM CHAIR is at a subordinate level.

    Could there be reasons for recognizing the phoneme as a basic level category in phonology? On this view, allophones would be subordinate to the basic level, while categories such as STOP and OBSTRUENT would be superordinate to the basic level.

    Refer to the discussion of basic level categories in Chapter 3. To what extent can the characteristics of the basic level with respect to semantic categories be applied to segmental categories in phonology? Consider, for example, the fact that native speakers of a language typically conceptualize the segmental structure of a word in terms of its constituent phonemes, not in terms of allophones, nor in terms of more abstract categories such as STOP and OBSTRUENT. (For further discussion of this topic, see Taylor 2002: ch. 8.)

2. Consider the English diphthong [au]. (This is the vowel that occurs in *cow*, *how*, and *now*.) Make a list of monosyllabic words which contain this vowel. Which consonants occur in the coda position of the rhyme? Which consonants appear to be unable to occur in the coda? Suggest a syllable construction which captures these peculiar facts about [au].

3. Non-attested forms. A distinction is commonly made between possible (but non-attested) phonological forms in a language, and impossible forms. Thus, for English, /blɪk/ does not constitute a word, but it could well do so; the word conforms fully to one of the syllable constructions of the language. On the other hand /bnɪk/ does not constitute an English word, and it could not do so; the form fails to conform to any syllable construction of the language.

    The distinction between possible and impossible words is likely to be a matter of gradience, rather than absolute. We might suppose that a non-attested form will be judged to be possible or impossible to the extent that its phonological structure diverges from the specification of a phonological construction in the language; some forms might diverge only minimally, others might diverge more drastically.

    Consider the following syllables from this point of view. How do you rate these as possible vs. impossible words in English? (You might want to present these syllables to a group of English speakers, and ask them to rate their acceptability on a scale of 1 = OK as an English word, through to 7 = totally impossible as an English word.) Can speakers' intuitions in this regard be related to the degree of phonological deviance of the syllables?

    | | |
    |---|---|
    | /pʊŋ/ | /vlɪd/ |
    | /pjuːm/ | /muːʃ/ |

/svæk/                    /leŋ/
/sfek/                    /ŋæt/
/zvaɪmp/                  /liːkʃ/
/sɑum/                    /priːmp/
/ʃnuːz/                   /pwɪk/

## Further reading

Cognitive linguistic treatments of phonological issues are still very thin on the ground. See however Nathan (1989, 1994), Taylor (2002: chs. 5, 8, 13), as well as numerous remarks scattered throughout Langacker (1987, 1991).

# CHAPTER 14

# The Acquisition of Categories

One of the stated aims of the Chomskyan paradigm is to account for the process of language acquisition; conversely, alleged facts of acquisition are continuously, even monotonously, invoked as evidence for the correctness of the paradigm. The form of the argument is familiar. An examination of syntactic, semantic, and phonological phenomena leads to the postulation of abstract entities which are not visible in the surface forms of a language. These postulated entities, and the rules which manipulate them, cannot therefore be learnt by any process of induction or generalization from mere exposure to the surface forms. This is the 'logical problem' of language acquisition, which, it is argued, can only be solved if the child is credited with a rich initial state of the language faculty. The child, that is, succeeds in acquiring a language because the scaffolding is genetically inherited. Acquisition is seen as the unfolding of the innate potential; only the arbitrary facts of the target language (the phonological shape of individual morphemes, for example) need to be learnt.

Cognitive grammar eschews abstract entities. The claim instead is that semantic content is structured and symbolized overtly, in the surface forms of a language, not at the level of abstract underlying representations. Acquiring a language is therefore seen in terms of the gradual accumulation of an inventory of 'symbolic units'—words, morphemes, and constructions—which associate a form and a meaning. To this extent, language acquisition does not

constitute a 'logical problem', in the way in which this term is understood by Chomskyan linguists. Nevertheless, the Chomskyan paradigm teaches a valuable methodological principle. Any attempt to characterize the (relatively) steady state of language knowledge presumed to be present in the mind of a mature speaker needs to consider whether the facts of acquisition accord with an account of how the steady state could be plausibly achieved. As far as the present discussion is concerned, this means, above all, inquiring into the development of categories in child language. We need to examine in this connection not only the acquisition of semantic categories symbolized by the meaningful morphemes of a language, but also data pertaining to the development of the formal categories of linguistic structure.

Although it has not taken place within an explicitly cognitive linguistic framework, much work in language acquisition over the past couple of decades is compatible with the principles and assumptions of cognitive linguistics. This is already apparent from the various contributions to Wanner and Gleitman (1982). More recently, a number of researchers in language acquisition have drawn explicitly on cognitive linguistic insights (see, for example, the contributions to Bates and Tomasello 2001). The reasons for this convergence are not hard to find. The child's emerging skill in the manipulation of the formal elements of language cannot reasonably be separated from the increasing range of meanings that she is able to express. By the same token, her growing ability to use language meaningfully cannot be isolated from the development of more general cognitive skills. Anyone studying the development of language in the young child is hardly likely to be able to find much inspiration in a theoretical model which makes a clean division between syntax and semantics, and between semantic structure and conceptualization, and which, moreover, assumes that the basic architecture of a language is already present in the child at birth. It is in child language, in fact, that we are particularly likely to find confirmation for the cognitive hypothesis of the grounding of language structure in non-linguistic cognition.

This chapter does not intend to offer a comprehensive overview of recent research into language acquisition. Rather, I will focus on a limited number of topics which are of particular relevance to the subject matter of the preceding chapters. It will be appropriate to begin by considering some general implications of a non-classical model of categorization for category acquisition. Assuming the essential correctness of the views presented so far in this book, how might we expect prototype and family resemblance categories to be learnt, in contrast to categories structured on purely classical principles?

## 14.1 Hypothesized acquisition routes

Classical and non-classical models of categorization give rise to different expectations as to the course that category acquisition will take. Let us

consider, first of all, classical categories. Classical categories, it will be recalled, are defined in terms of a conjunction of necessary and sufficient features for membership. Assuming the correctness of the classical theory, we might suppose that a classical category will be acquired through the gradual assembling of the appropriate feature set. Initially, the child's specification of the category will be incomplete; one or more of the criterial features defining the category will be missing. The consequence of incomplete specification will be overextension with respect to the range of entities that can count as members of the category. A lexical item will have a much wider denotational range than the adult word, grammatical categories will include items excluded from the adult category, and so on. As further features are added to the child's definition, overextension will be curtailed, presumably in quantal jumps, until eventually the child's representation of the category coincides with the adult's.

This rather simple model (a detailed version was proposed by Clark 1973*b*) assumes that at every stage in the child's development the features defining the child's category form a proper subset of the features defining the adult category. We should not, however, exclude the possibility that the child at some stage incorporates into her category specification features which are absent from the adult category, or gives a feature the wrong value, e.g. [+] rather than [−]. Such spurious feature specifications will lead, not to overextension, but to varying degrees of overlap between the child and the adult category. The model is open to refinement in other respects. Consider, for example, the nature of the features. If features are taken to be abstract primitives, as the pure classical model requires, then it is clear that the semantic content of a feature will remain unchanged as the child moves towards adult competence. [MALE] will 'mean' the same thing for the two-year-old as for the mature adult. If, on the other hand, we accept that features might be cognitively quite complex, the possibility arises that features themselves might undergo development. Initially, [MALE] might be understood in terms of perceptual characteristics, the biological understanding emerging only later.

Less strong versions of the classical model might thus be compatible with a course of acquisition which diverges in minor details from the hypothesized initial overextension, followed by contraction, in discrete steps, of the category boundaries. In contrast, the prototype model makes a clear prediction of initial underextension. Prototype categories will initially crystallize around a mental representation of a prototype. This may take the form of a cluster of perceptual and functional attributes; alternatively, and perhaps more realistically, the prototype may be understood as a holistic gestalt. Further acquisition will proceed by extension from the prototype. Things will get assimilated to the category on the basis of some kind of perceived similarity to the prototype. The dimensions of similarity exploited by the child may not, of course, be the same ones that underlie the extension of the adult category, neither need the child's representation of the prototype exactly coincide with the adult's. The child's emerging prototype category need not, therefore, at every

stage be properly included in the adult category. Gradually, however, the child will adjust her prototype representation in accordance with adult norms, and will learn to select the appropriate dimensions of similarity as criteria for category membership. Not to be overlooked, too, is the learner's increasingly sophisticated understanding of the domains against which semantic categories are profiled. Eventually, after perhaps intermediate periods of overextension or overlap with respect to the adult category, her category will become roughly isomorphic with the adult category. A similar process is indicated for family resemblance categories. Initially, while the central member is being acquired, the child will underextend with respect to the adult category. This stage will be followed by a stepwise extension along the chaining links which hold the adult category together; alternatively, the child may experiment with chaining extensions which are not sanctioned by adult usage.

It will be noted that both the classical and non-classical models can accommodate category overextension during the acquisition process. Overextension, however, takes a rather different form in the two cases. Overextension of a classical category is due to the fact that membership in the category has not yet been narrowed down sufficiently; one or more criterial features defining the adult category have not yet been added to the child's specification. Symptomatic of this state of affairs will be the use of a lexical item corresponding to the adult use of a superordinate term. Suppose, for example, that a child's initial understanding of *dog* contains the feature [ANIMAL] but still lacks the differentiating feature [CANINE]. The child will apply the word *dog* to all manner of animals. As the appropriate criterial features are added to the child's specification, the range of things which pass as members of the category will contract, in quantal steps. Overextension of a prototype or family resemblance category, on the other hand, will proceed outwards from a conceptual core. Initially, *dog* will be applied only to prototypical exemplars of the category, perhaps even the word will be restricted to one particular exemplar; as the category is extended, the word will apply to an increasing range of creatures, which possibly goes beyond those conventionally designated by the adult word. Overextension will need to be followed by a contraction of the category, as the child learns just which creatures the word *dog* may be applied to. Extension, and subsequent contraction, will be gradual rather than quantal. Moreover, usage at the periphery of the category may well be vacillating, in contrast to the stability of the category centre.

The models for category acquisition sketched out here presuppose that adult categories are acquired through a process of accretion to the nascent child category, with minor adjustments along the way. Only thus is it possible to make inferences from the structure of adult categories to the manner of their acquisition, and vice versa. One cannot, however, rule out the possibility of category restructuring during the acquisition process. We have, in fact, already hinted at such a possibility in Section 4.2. The extraction of schemas (in Langacker's sense), and the imposition of expert definitions during the

course of formal education, may effectively trigger a redefinition of erstwhile prototype categories in terms of a set of criterial properties.

## 14.2 Grammatical categories and constructions

Let us now consider some predictions concerning the course of syntactic acquisition. Recall the generative account of constructions (pp. 211–12). According to Chomskyan, and most formalist theories of syntax, items in the lexicon are marked for their lexical category, such as N, V, etc. Rules of the syntax allow items of the appropriate category to be assembled into syntactic configurations. One might suppose that once the child has acquired the rules for generating a particular construction—a transitive clause, let us say—she will be able immediately to apply the rules productively to all the items in the lexicon which belong to the appropriate lexical categories. As soon as the child is able to produce a transitive clause such as *Johnny hit me*, she will be able to use all the transitive verbs that she knows in transitive clauses. To be sure, these remarks beg the question of how the syntactic rules are acquired in the first place. Chomskyan theory has it, that this occurs through the 'triggering' of genetically transmitted parameters of Universal Grammar. The theory predicts that, once the parameters have been 'triggered', the relevant construction will become available to the child, and will be used over the full range of lexical items of the appropriate categories.

There is considerable evidence—both from the observation of natural acquisition, and from experimental situations—which casts serious doubt on this instantaneous acquisition scenario. Grammatical constructions do not suddenly emerge, fully-fledged, at a certain stage of a child's linguistic development. Rather, it seems that they are first learned in association with specific lexical items. Thus, the child's first uses of a transitive clause, or of a passive clause, have something of the status of lexically specified idioms. At this stage, the construction is used only in association with the lexical items with which it was learned. Gradually, over the course of time, as more 'idioms' instantiating the construction are learned, a more abstract schematic representation of the construction is able to be extracted, which generalizes over the individual instances. As a consequence, the child is able to use the construction productively, with a range of different lexical items. Even so, it takes time before the productive use of the construction fully conforms with adult norms. Initially, use of the construction is restricted to a core of semantically prototypical examples, only later is it extended to encompass the full range of adult usage.

Let us suppose that a two-year-old child comes out with her first transitive clause, for example, the three-word utterance *Johnny hit me*. We might take this momentous event to be evidence that the child has acquired the rules for creating a transitive clause. Alternatively, it could be that the child has simply learned an idiosyncratic fact about the word *hit*, namely, that it can be used in

an [N$_1$ hit N$_2$] construction, where N$_1$ designates the hitter and N$_2$ the person that is hit. This is the interpretation favoured by Tomasello and his co-workers, on the basis of a series of ingenious experiments. In their experiments, they would teach young children some novel words. Each word would be taught in a certain syntactic frame. The general finding was, that the children are able to use the novel word in their own speech, but only in the syntactic frame in which it had been learned. The children were in general very reluctant to use the new word in other syntactic frames, even though they were able to use these other frames in association with other lexical items. For example, Tomasello and Brooks (1998) presented children between the ages of two and two-and-a-half with highly transitive situations, involving, for example, a puppet doing something to a small object. They then described the situations using novel verbs. In one condition the novel verbs occurred in the transitive construction (e.g. *The puppet is meeking the ball*, cf. *The puppet is rolling/bouncing/moving the ball*). In the other condition the verbs were introduced in an intransitive construction (e.g. *The ball is meeking*, cf. *The ball is rolling/bouncing/moving*). It was found that the children who had learned a new verb in the one construction were very reluctant to use it in the other, even when prompted to do so. For example, children who learned the verb *meek* in an intransitive context (*The ball is meeking*), would readily use *meek* as an intransitive, but when asked what the puppet was doing, would tend not to say that the puppet is meeking the ball, even though the same children were able to use other verbs in the transitive frame. Tomasello and Brooks conclude that children learn the transitive and intransitive constructions on a verb-by-verb basis; or, to put it another way, they learn each verb in association with the construction(s) in which it occurs. Similar findings have been observed for a number of basic syntactic patterns, including the passive (Brooks and Tomasello 1999) and interrogatives (Dąbrowska 2000).

The 'gradualness' of syntactic acquisition had been observed by Roger Brown, who noted that 'the productive acquisition of a syntactic construction seldom at first entails using it over the full semantic range to which it applies' (Brown 1973: 233). Amongst the examples that Brown discussed, two have to do with categories already studied in earlier chapters, namely the past tense and the possessive. It will be of some interest, therefore, to examine these cases in more detail.

In Section 9.3 I proposed a family resemblance structure for the meanings of the past tense; the central sense involved reference to past time, while the counterfactual and pragmatic softening senses had a more peripheral status. As one would expect, it is the hypothesized central sense which first emerges in child language; indeed, according to Brown, counterfactual past tenses do not occur at all until a comparatively late stage of development, namely from the age of about six. (Brown gives no data on the use of the past tense as a pragmatic softener.) Brown's data, however, not only lend support to our proposed family resemblance structure of the category, they also suggest that

our original account of the past tense may need to be refined. Brown noted that the first instances of the past tense refer exclusively to the immediately preceding past; only later does the child extend the meaning of the past tense to include the more distant past. Secondly, the past tense is not initially applied across the board to all the verbs in the child's lexicon. Earliest uses are restricted to items like *fall*, *drop*, *slip*, *crash*, *break*,[1] which designate essentially punctual events; furthermore, the events involve a highly salient change in state—usually a change for the worse—for one of their participants, i.e. for the thing or person that falls, drops, slips, is broken, etc. Only later does the child extend the past tense to verbs denoting non-punctual events and non-visible mental states, like *see*, *watch*, *know*. It seems, then, that the central meaning of the past tense is not simply pastness with reference to the moment of speaking, as suggested in Chapter 9. The central meaning is much more specific, namely "completion in the immediate past of a punctual event, the consequences of which are perceptually salient at the moment of speaking".

Brown's other example concerns the possessive. We saw in Section 12.3 that the prenominal possessive construction can denote many different kinds of semantic relation between a 'possessor' and a 'possessed', and proposed, as the central member of the category, a relationship based on a common law notion of property. Brown notes that in the overwhelming majority of possessive constructions in early speech—examples include *Daddy chair*, *Eve seat*,[2] etc.—the possessor noun serves as a kind of modifier, which enables the speaker to identify an object in terms of either a long-term or a more transitory relation to a human being. These uses, according to Brown, reflect 'primitive local notions of property and territoriality', which give the possessor 'prior rights' of access to the possessed (1973: 233). Significantly, such uses of the possessive in early speech far outnumber cases like *Daddy nose*, where the construction is used to denote a whole–part relationship.

Many other cases of initial underextension of grammatical and morphological categories could be cited. Let us take another example relevant to our earlier discussion (cf. Section 9.2). Bates and Rankin (1979) found that, at age three, Italian children were making extensive use of diminutive and augmentative suffixes. Mostly, the suffixes were being used in their central senses, i.e. they referred only to the physical size of concrete objects. The full range of affective meanings, so characteristic of the adult language, had yet to be acquired. Of particular interest, also, is the acquisition of the transitive construction. Slobin (1981) speculated that, in the early experience of the child, certain constellations of circumstances in the world come to acquire the status of prototypical transitive events. Highly transitive events then get mapped on

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[1] At issue here is not the child's mastery of the appropriate morphological marking of the past tense, but merely the past tense use of the verbs, irrespective of the morphological correctness (by adult standards) of the child's forms.

[2] See n. 1 above. At issue is not the child's use of possessive morphology, but the construal of two nouns in a possessive relationship.

to the transitive clause construction, realized in English by means of word order (subject-verb-object) or, in some other languages, by case marking, usually also in association with word order preferences (e.g. nominative-verb-accusative). The correspondence between the event and the construction is established by age two.

The transitive construction emerges out of earlier two-word combinations, i.e. agent-action and action-object, which themselves embody components of prototypical transitivity. Evidence for the correctness of Slobin's thesis comes from the fact that transitive sentences involving non-punctual events and non-perceptible mental states occur later than examples of prototypical transitivity. Slobin cites the case of a Russian child who first applied accusative case marking only to the direct objects of action verbs (*put*, *throw*, *give*), only later marking with accusative case the objects of mental experience verbs (*read*, *see*, *know*). It is also significant for Slobin's thesis that the child's productive mastery of active transitive clauses predates by a long period the first passive clauses; furthermore, the first passives to be comprehended are those which involve reversals of prototypical transitivity. The salience of prototypical transitivity is also suggested by the fact already noted, that the past tense is first applied to the kinds of verbs which are likely to participate in highly transitive events.

Slobin suggests that the full range of transitive clauses is acquired through a process of 'metaphorical and semantic extension' from the prototype. The process has been discussed by Schlesinger (1981). Schlesinger proposes that gradually instruments and experiencers, as well as agents, come to be used as subjects of transitive clauses, the instruments and experiencers thereby taking on 'the semantic flavour of agency' (1981: 241). In a sense, the instrument also 'performs' an action, analogous to the agent; in a different kind of way, a person directing his attention to a state of affairs is also engaged in an 'action'. In this connection, Schlesinger makes the highly pertinent observation that the semantic role categories of agent, instrument, experiencer, etc. are by no means as clear-cut as many expositions of case grammar (e.g. Fillmore 1968) would have us believe. A mother handing a bottle to the child is clearly an agent performing an action. But what if the mother merely holds the bottle? And what about the bottle holding the milk? There is, in these cases, no clear cut-off point which separates agent–action from a stative relation. Or consider, as another of Schlesinger's examples, the gradience between action-verbs and experience-verbs manifested in the series *Tom writes down/figures out/guesses/recalls/remembers/knows the date.*

The semantic-based approach to grammatical categories has been strongly criticized by Maratsos, in various publications (e.g. Maratsos and Chalkley 1980). Maratsos points to the problems associated with a purely semantic definition of lexical and grammatical categories like NOUN, VERB, ADJECTIVE, SUBJECT. He pointed out that (*to*) *please*, (*to*) *like*, and (*to be*) *fond* (*of*) are roughly equivalent, semantically. Yet *fond* is an adjective, *please* and *like* are

verbs, *like* takes as its subject the experiencer, while with *please* the experiencer appears as the direct object. If, Maratsos argues, the child were to build up her categories on the basis of a common semantic denominator, one would expect, initially at least, a large number of form class errors, that is to say, the semantic similarity of *like* and *fond* would give rise to errors of the kind \**He fonds her*, on analogy with *He likes her*. Such errors are relatively infrequent.[3]

Maratsos and Chalkley also discuss (and reject) a prototype view of grammatical categories, according to which 'people both analyse and permanently represent major categories . . . according to the statistically modal or "core" semantic analysis of their members' (1980: 177). The facts of semantic overlap between categories, they argue, preclude such an approach:

[T]he term *careful* functions grammatically as an adjective but semantically it very closely resembles the 'best' examples of an action term prototype (i.e., physical contact can be involved, an animate entity intentionally controls the activity; it can refer to a brief event). There exists, simply, no semantic boundary which can adequately deal with the profligate crossover of meanings of terms of different syntactic categories. Thus, the hypothesized semantic-based prototype should result in errors such as incorrectly labeling . . . *careful* as a 'good' action term; and lead to errors of use like . . . \**He carefuls the toy*. If one uses only semantic criteria (even in the form of a prototype) for determining how to cluster grammatical privileges to terms, one would never be able to achieve adult linguistic competence. (Maratsos and Chalkley 1980: 178)

Maratsos thus claims that grammatical categories need to be defined in purely formal terms; an item belongs to the category VERB, not because of what it means, but simply in virtue of the fact that it can be inflected for past tense and for subject agreement. That even very young children are able to manipulate formal categories—that they in some cases latch on to formal properties earlier than semantic commonalities—is shown by the acquisition of gender. In languages like French and Hebrew, every noun is obligatorily assigned either masculine or feminine gender, and every pronoun must be marked according to the gender of its antecedent; other languages, like German and Russian, have a three-way gender system (masculine, feminine, and neuter). As far as inanimate nouns are concerned, gender assignment is arbitrary; in these cases, gender categories may be seen as nothing other than highly correlated distributional patterns, with no semantic base. In German, being of masculine gender simply means that when a noun is nominative singular, it is preceded by the *der*-form of the definite article, when accusative singular by the *den*-form, and so on. Semantic motivation does, however, enter into the gender of nouns and pronouns referring to humans; here gender does

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[3] They do, however, occur. Examples from Clark (1993) include *I'm talling* and *It's soring* (said of a scrape), which do seem to testify to the kind of semantics-based confusions that Matatsos is referring to. These examples should perhaps be distinguished from children's (and adults') quite frequent creation of new verbs from nouns, as in *I broomed her* (i.e. hit her with a broom), *He's keying the door* (i.e. opening it with a key), and *It's teaing* (said of a teabag immersed in hot water).

correlate in the vast majority of cases with sex. If the child learner were looking for semantic commonalities in grammatical categories, one would expect that gender assignment would first manifest itself on human nouns and pronouns, gender assignment for non-human nouns being at first random and error-prone. The opposite, however, seems to occur (Levy 1983). Children master arbitrary gender assignment of nouns during their second year of life, well before they learn to select the appropriate sex-marked personal pronouns.

We must certainly take cognizance of the fact that young children are sensitive to the correlation of purely formal properties of language items, for example, the fact that some nouns are regularly associated with certain forms of the definite and indefinite articles, while other nouns co-occur with other forms of the articles. Nevertheless, there are several flaws in Maratsos's argumentation. Firstly, Maratsos accepts without question traditional (and rather simplistic) views on the semantic motivation (or the lack of it) of grammatical categories. In the case of German, at least, the received view that the gender of non-animate nouns is completely arbitrary has been questioned by Zubin and Köpcke (1981, 1986), while Langacker's (1987) more abstract characterization of NOUN and VERB goes some way towards capturing the common essence of the categories. A related fact is that although *like*, *please*, and *fond* might be similar in meaning, they are not identical, and do structure a perceived state of affairs in different ways. Secondly, there is nothing in the prototype approach to categories which demands that only semantic criteria be employed for the characterization of the prototype; I argued extensively in Chapters 11 and 12 that the prototypes of grammatical categories need to be specified in terms of both semantic *and* formal criteria. Furthermore, purely formal properties considered by themselves are not, in general, consistent with all-or-nothing membership in grammatical categories. On both semantic and formal grounds, there are reasons for regarding some nouns as 'nounier' than others, some transitive clauses as 'more transitive' than others. In this respect, gender categories (where membership is a clear matter of either-or) are perhaps rather untypical of grammatical categories as a whole. A final point is that the role of semantic criteria needs to be seen in the context of the child's more general cognitive development. It is to this issue that we now turn.

## 14.3  Conceptual development

Cognitive linguistics takes a broad, encyclopaedic view of meaning. Axiomatic for the approach is the thesis that the meaning of any linguistic form can only be characterized relative to an appropriate cognitive domain, or set of domains (see Chapter 5). Domains encapsulate knowledge and beliefs about the world, and may vary in complexity from a basic apperception of time and oriented space, through to highly sophisticated scientific theories about the nature of matter. Given the role of domain-based knowledge in the

characterization of meanings, it is clear that the child's grasp of the semantic import of a category distinction is necessarily dependent on a prior understanding of the domain against which the semantic distinction is to be drawn. It may well be the case that in languages with gender systems the overwhelming majority of human nouns are assigned non-arbitrarily to the gender classes on the basis of the sex of their referents. Notions such as male and female, however, are anything but semantic primitives; they are, as Susan Carey (1982: 368) puts it, highly 'theory-laden' concepts. Initially, no doubt, the child can rely on perceptual differences between men and women—aspects like hair length, body shape, voice pitch, and kind of clothing worn. However, an adequate understanding of these notions presupposes, if not a fully articulated biological theory, at least a fairly sophisticated folk theory of sex differences and sex roles. The incorporation of sex differences into the specification of linguistic categories must necessarily await the development of the appropriate domain-based knowledge. Such a development, it seems, does not take place before age three (Levy 1983).

Arguably, one of the most fruitful points of interaction between the cognitive linguistic approach and child language research is likely to concern the relationship of the child's language to the current state of her cognitive development. Many of the young child's lexical errors *vis-à-vis* the adult language would seem to be traceable to the non-availability of the relevant cognitive domains. Consider, for example, the frequent misuse in early speech of *old*; applied to human beings, the word is often used as if it were synonymous with *big*. Now, *old* can only be adequately characterized against the domain of the life cycle. Until the notion of the life cycle is grasped, there can be no basis for knowing what it means to say that one person is old, or getting old, or that another is not old. The young child merely associates being old with the perceptual attributes of old people, such as their fully grown size. Young children may similarly fail to understand what it means to say that one person is the brother or sister of someone else. In early speech, before the notions of birth, parenting, and kinship relations have been properly understood, *brother* and *sister* are liable to be used as equivalents of *boy* and *girl* (Carey 1982: 373 f.).

The role of domain-based encyclopaedic knowledge in language mastery goes much deeper than these few lexical examples might suggest. Let us look again at the notion of prototypical transitivity. A (usually human) agent performs some action which affects a patient; a boy, for instance, kicks a ball. The event is construed as a unitary, punctual happening. Yet the event of kicking a ball may be arbitrarily decomposed into any number of subevents: balancing one's weight on one leg, raising the other leg from the ground, flexing the leg at the knee, and so on. Conversely, the action of kicking a ball may itself be seen as a component part of a larger event, say a ball game. Prototypical transitivity, then, presupposes a conceptualization of events at a certain level, or 'granularity', of categorization, rather than at a micro-level of subevents,

or at a level of macro-events. Similar remarks apply to the participants in a transitive event. One may focus attention on any arbitrary part of the agent or patient, and agent and patient may themselves be seen as parts of larger conglomerations of entities. Yet agent and patient are not normally conceptualized as conglomerations of parts, nor as parts of larger configurations, they are conceptualized as gestalts, functioning within a unitary event. How then does the child know, when learning the word *kick*, that the word refers to the unitary event of kicking, and not to some arbitrary component of the event, say, flexing the leg? How does he know that *fall* encompasses the total trajectory followed by a falling object, such that a ball falling from a table on to the floor instantiates only one instance of falling, rather than a sequence of falling events? And on what basis does he infer that a ball rolling away after it has fallen instantiates a separate, though temporally contiguous event? Similarly with nouns. On hearing the word *ball* in conjunction with the presence of the referent, how does the child correctly conclude that the meaning of the word has to do with the whole entity, and not with a portion of its curved surface?

We are touching here on Quine's celebrated thesis of the 'indeterminacy of translation' (Quine 1960: 29 ff.). Quine posed the problem in terms of a field linguist attempting to break into the semantic system of a totally alien language. On hearing the native speaker of the language utter the word *gavagai* as he points to a rabbit scurrying across his path, the linguist would no doubt infer that *gavagai* means "rabbit". But on what basis? Could not *gavagai* mean "scurrying rabbit", "adult rabbit" (assuming it was an adult rabbit that scurried across the linguist's path), or "brown rabbit" (assuming, once again, that it was a brown rabbit that the linguist saw)? These issues could no doubt be settled by further investigation, by finding out whether the native uses *gavagai* of a sitting rabbit, a young rabbit, or a white rabbit. (Still, the number of false hypotheses will be immense, and possibly indeterminate, such that there will be no end to the series of experiments that the linguist will need to perform in order to fix the meaning of *gavagai*.) But what about the meanings "rabbit parts attached to each other", or "temporally transient instance of rabbithood"? These meanings would be equally consistent with the use of the word *gavagai* in the presence of a rabbit. Moreover, there would be no way of testing whether any one translation is to be preferred over the others. And yet we feel, intuitively, that "rabbit" is the only plausible meaning; the latter translations are simply bizarre.

Quine's problem repeats itself whenever a young child infers the meaning of a term from its use in a specific context. The very fact that learners do not make bizarre inferences of the kind discussed by Quine strongly suggests that learners are cognitively biased towards certain conceptualizations of entities and events, and not towards other conceptualizations which, from a logical point of view, would be equally plausible. Pre-eminent, in this connection, seems to be the deeply ingrained notion of what it means for something to

be a physical object. Physical objects stand out as gestalts against their surroundings; they can be handled and can be moved independently of their environment; they possess a characteristic shape and texture. Even though they are typically made up of parts, they are not seen as configurations of parts, but as wholes, with a fairly stable internal constitution. Even though their appearance might change relative to the location of a viewer, and the objects might even disappear for a time from the viewer's field of vision, they are nevertheless thought of as enduring, unchanged, over time. Pulman (1983: 56 ff.), drawing on the relevant developmental research, points out that the notion of physical object as something permanent, detachable, observable, and feelable is already present in the child by age one. It is, *pace* Quine, a basic element of a person's folk ontology. The notion of a physical object not only guides children in the acquisition of noun categories such as table, sofa, plate, etc. It is also, we may suppose, the locus for the emergence of the notion of an event. Prototypically, events involve a change in state of a physical object. Such changes in state are likewise conceptualized as unitary, and fairly homogeneous in their internal constitution, being bounded on either side by the relative stability of the object, or by sudden discontinuities in the manner of change. Thus not any randomly segmented change in the universe can qualify as an event: a ball falling from a table on to the floor is seen as one event, not as several, while the rolling away of the ball after it has fallen is seen as a second event.

The child's early prototypes of physical object and event are part of that encyclopaedic knowledge of the world which is a precondition for the understanding of word meanings, and for the emergence of prototypical transitivity as a cognitive unit. In the course of the child's development, these notions will need to be extended from the early prototype. The category of physical object, for example, will have to be extended so as to include, at the very least, parts of wholes ('wing', 'leg', 'handle', etc.), invisible and non-manipulable substances ('air', 'fog'), things characterized against domains other than three-dimensional space (noises, emotions, thoughts), institutional things (countries, national frontiers), as well as things consisting of non-contiguous parts ('fence', 'archipelago'). Likewise, the notion of event will need to be extended from the prototype, so as to include activities, mental states, and stative relations.

The interplay between the child's emerging knowledge of the world and her developing linguistic skills may be illustrated by a further example, namely the expression of spatial relations. In a well-known paper, Clark (1973a) studied the understanding of the static spatial concepts "in", "on", and "under" in children aged 1;6 to 6;11. The children were asked to place a given object (the trajector, or TR; cf. Section 6.3) in a relation of 'in', 'on', or 'under' with respect to another object, the landmark (LM). It was found that if the LM could function as a container, the youngest children invariably placed the TR inside the LM, irrespective of the instructions given to them. If the LM did

not have a clearly defined inside, the TR was placed on its upper horizontal surface, again irrespective of the experimenter's instructions. Only rarely did the children position the TR under the LM, even when explicitly asked to do so. This suggests that below age three (by which time they seem to have worked out the different meanings of *in*, *on*, and *under*) children have very clear ideas about where objects 'belong'. The relationship of inclusion is the most salient; if inclusion is not possible, because of the shape of the LM, the positioning of a TR on top of the LM is preferred. A further experiment reported in Clark (1973*a*) required the child to position a TR with respect to a LM in imitation of a model set up by the experimenter. The children's responses again suggested the salience of in- and on-relations. A configuration consisting of a small toy placed beside an upright glass was imitated by the toy being placed inside the glass; the child would place the toy on top of a block when imitating a configuration consisting of the toy placed beside the block. A further interesting finding was that children tended to imitate a configuration of proximity by positioning the TR in contact with the LM. Clark and Clark (1976: 504) also note certain preferences with regard to the understanding of dynamic spatial relationships. Just as relationships of 'in' and 'on' are more salient to two-year-olds than a relationship of 'under', so three-year-olds seem to have clear notions of how objects should move with respect to each other. Irrespective of whether the instructions were to move an object towards or away from the LM, the children invariably moved the TR towards the LM.

These experimental findings may be put alongside Slobin's (1985) observation that in languages where place and goal are encoded differently (such as German, Slavonic, and Turkish), it is a common error for young children to use place marking for both relations, while the source relation, although acquired later, is never conflated with place or goal. If a young child knows that one object exists in a spatial relation to another object, she initially assumes that either the relation is static, or, if it is dynamic, that it will continue until a static relation of contact is achieved. Thus goal comes to be conflated with place, both relations being encoded by the same linguistic form, while the source relation remains cognitively and linguistically distinct. It is significant that this state of affairs, typical for the acquisition of German, Slavonic, and Turkish, persists to some extent in adult English. As noted in Section 7.1, many place prepositions in English can also express a goal relation, while the polysemy of place and source is comparatively rare.

## 14.4  Word meanings

I have argued that the acquisition of grammatical categories provides strong evidence for the correctness of a prototype view. The relevant point was that grammatical categories seem to be restricted, initially, to a small range of

central instances, the category gradually being extended to encompass the full range of adult uses. With word meanings the situation is somewhat different. Superficially, at least, the well-known phenomenon of semantic overextension in very early speech would seem to support the classical theory, according to which word meanings are built up feature by feature. For instance, the fact that *doggie* may be used by the young child to refer, not only to dogs but to all small four-legged animals, would suggest that the child's feature specification for the word is still incomplete, that his word roughly corresponds, in fact, to the superordinate term *animal* in adult language. Similarly, the fact that *Daddy* is used not only of the child's father but of all adult males might suggest that the child is operating with the incomplete feature specification [ADULT] and [MALE], the feature [PARENT OF] still needing to be added.

The classical view predicts that the first categories to be learnt by the child will be those specified by a minimum number of features. These categories will, perforce, be categories at a very high level of abstraction, like PHYSICAL OBJECT, ANIMAL, etc. There is strong evidence, however, that abstract categories emerge relatively late in the child's development, well after the acquisition of categories at the basic level (Brown 1958). The matter was investigated by Rosch *et al*. (1976). Children were presented with sets of three pictures, and asked to say in each case which two pictures went together. In some of the triads, the pictures could be paired with regard to common membership in a basic level category (e.g. types of car), while in other triads only categorization at a superordinate level (e.g. types of vehicle) was possible. The youngest of the children studied (three-year-olds) were able to sort into basic level categories virtually without error. When pairing at superordinate level, however, three-year-olds scored only 55 per cent correct; by age four, though, performance on superordinate sorting had risen to 96 per cent correct. Interestingly, the youngest subjects could sort correctly at the basic level even though they might not be able to name the depicted objects, or to give other reasons for their categorizations.

Children's difficulties with categories superordinate to the basic level are well documented (see, e.g. Markman 1989: ch. 8). For example, a child might use the word *animals* to refer to a collection of different animals, but be reluctant to use the word *animal* of an individual dog or cat. Or suppose that a child is told that he mustn't jump up and down on the furniture (specifically, on the sofa). The child continues jumping up and down on the sofa, not out of disobedience, but because he fails to grasp the intended reference of the superordinate term *furniture*.

The salience of basic level categories, even in very young children, is fully in accord with Rosch's hypothesis that basic level categories maximize the number of perceptual, functional, and other attributes shared by members of the category (Section 3.3). The delayed development of superordinate categories, on the other hand, contrasts strikingly with the course of development predicted by the classical theory. On the classical theory, the feature

specification of a higher-order category is included in the feature specification of each subordinate category. The category ANIMAL is defined by means of the feature [ANIMAL], and kinds of animals, such as dogs and cats, are specified by the feature [ANIMAL] in association with further distinguishing features, like [CANINE], [FELINE]. In terms of their feature structure, the basic level categories are more complex than the superordinate category. On the assumption that feature specifications are acquired one by one, we would expect—indeed, the feature theory requires—that superordinate categories are learnt before subordinate ones.

The delayed acquisition of higher-order categories needs to be seen in the context of the young child's inability to abstract from a range of diverse entities those properties which the entities have in common. (It is the relatively late emergence of this ability which supports my earlier contention—see Section 4.2—that categorization by schema, as postulated by Langacker, occurs subsequent to a prior categorization by prototype.) Consider in this connection Piaget's well-known 'bead-problem' (Piaget 1947: 133). Children are shown a box containing a number of wooden beads. Some of the beads are white, while most of them are brown. In response to the question 'Which are there most of, brown beads or wooden beads?', children below the age of about seven almost invariably respond that there are more brown beads. For children who give this response, the brown beads and the white beads constitute two mutually exclusive classes. Only at a comparatively late stage of development does the ability emerge to abstract from these two classes a common schema, characterized by the attribute which the classes have in common, i.e. [wooden]. In view of these considerations, it seems more plausible that the young child's failure to use words like *Daddy* and *doggie* in their restricted adult sense reflects semantic extensions from a prototype, ones not sanctioned by adult usage, rather than categorization at a more abstract, featurally more impoverished level.

Detailed, longitudinal studies of children's early vocabulary development (e.g. Bowerman 1978, Rescorla 1980) seem to bear out this hypothesis. These studies suggest, firstly, that dramatic overextension *vis-à-vis* the adult system is by no means typical of all, or even of the majority of the words in the child's early vocabulary. In fact, the words most likely to be overextended are the dozen or so which are acquired very early. Rescorla's data for these words (collected in the main by parents in naturalistic settings) allowed a number of temporal patterns to be distinguished. In some cases, a word was used for a gradually narrowing range of referents. A more common pattern was for a word to be extended first in one direction, then in another, with varying degrees of temporal overlap between successive extensions. Consider the data for *Daddy*. Overextensions for one child took the following sequence: the child's father (age 1;1–1;2), other fathers (1;3–1;4), her father's possessions (1;4–1;5), and pictures of men and animal fathers (1;5–1;6). A rather more complex example concerns the word *clock*:

One child used the word *clock* first for an unfamiliar picture of a cuckoo clock and immediately after for his parents' alarm clock; he then extended the word within a month to many clocks and clock pictures, watches and watch pictures, meters, dials, and timers of various sorts, bracelets, a buzzing radio and telephone, and a chevron-shaped medallion on his dishwasher; finally he limited the word to clocks and watches, saying *clock-buzz* for the alarm clock and *clock-ticktock* for watches. (Rescorla 1980: 331–2)

Initially, *clock* was used to refer only to clocks, more specifically, a buzzing alarm clock (presumably, the buzzing alarm clock formed the centre of the child's representation of the category). Things were then assimilated to the category on the basis of shared attributes with the prototype—watches on account of a common function, a buzzing radio and the telephone on account of the sound they made, dials and the dishwasher medallion on account of their circular shape. The inclusion of bracelets in the category was presumably mediated by initial extension to watches. The child's category thus exhibits the same kind of internal structure as the complex adult categories studied in Chapters 6 and 9. Of course, the child's clock-category does not enjoy conventionalized status in the English language (or presumably in any other adult language). Not infrequently, however, a child's apparently idiosyncratic extensions in his mother tongue do happen to correspond with conventionalized polysemy in other languages. A typical semantic extension amongst English-speaking children is the use of *open* and *close* in the senses "switch on/off" and "turn on/off"; that is to say, the words refer to the operation of electric lights, television sets, and water taps, as well as to the opening and closing of doors and windows (Bowerman 1978). These metaphorical senses (the schemas of gaining and closing off access to a three-dimensional container are transferred from the spatial domain to the domains of the functioning of electrical and water devices) are not conventionalized in adult English. The translation equivalents of *open* and *close* in some other languages, e.g. French, Italian, and Russian, do however include "switch on/off" and "turn on/off" amongst their conventionalized senses.

    In the discussion of natural phonology in Chapter 13, I referred to the thesis that acquiring the phonology of a language involves the suppression of certain natural phonological processes and the exploitation of others. There is perhaps a parallel to be drawn with the acquisition of semantic categories. The example of *open* and *close* suggests that the acquisition of adult word meanings might consist, not so much in the child learning to make a set of semantic extensions from a prototype, but rather in the restraining of natural processes of category extension, and the channelling of these in accordance with adult norms. By the same token, the creative extension of a category in adult speech, e.g. by novel metaphor, may be seen as a regression to an earlier stage of language development, where word meanings are fluid, and subject to uninhibited and idiosyncratic extensions in all directions. The emergence

of adult categories is thus testimony to the dialectic of convention and motivation that has been implicit throughout the discussion in the preceding chapters. The semantic categories of adult language are conventionalized, and rarely stand in one-to-one correspondence to the categories of other languages. Yet the categories are not arbitrary, but are structured along natural principles of category formation.

## Study questions

**1.** Comment on the following data (each set is from a single child) from the perspective of category acquisition. (Data from Barrett 1995)

*off*　　　Initially used while the child removes an item of clothing from either her own or another person's body.
　　　　　Subsequent uses: When seeing another person remove an item of clothing; while trying to pull away from her mother; while pulling a toy cat out of a carrycot; to refer to getting off a train.

*close*　　Initially used only for closing gates, doors, and drawers.
　　　　　Subsequently used for closing boxes and other containers; while pushing together handles of scissors, tongs, and tweezers; for getting people to put their arms or legs together; for folding up a towelette; while fitting a piece into a jigsaw puzzle.

*kick*　　Of kicking a ball; of a fluttering moth; of cartoon turtles doing the can-can; making a ball roll by bumping it with the front wheel of a kiddicar; pushing a teddy bear's stomach again the chest of another child; pushing own stomach against a mirror; pushing own chest against a sink.

*umbrella*　of an open umbrella, a large green leaf, and kites (but *not* used of closed umbrellas).

**2.** Suppose that a child's earliest uses of *over* occur in the expressions *fall over*, (*come*) *over here*, (*put it*) *over there*, and *all over* (*the floor*). (For corpus-based studies of prepositions and their acquisition by children, see Hallan 2001 and Rice 2003.) What would be the implications of this for the family resemblance model of polysemy, as presented in Chapter 6? What would be the implications for the various approaches to polysemy that were discussed in Chapter 8?

## Further reading

On the acquisition of categories and word meanings, see Markman (1989), Keil (1989), Clark (1993), Barrett (1995), and Bloom (2000).
　On the acquisition of constructions, see Tomasello (1998, 2000).

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BLS:      *Proceedings of the Berkeley Linguistic Society*
CLS:      *Proceedings of the Chicago Linguistic Society*
LAUD:     Linguistic Agency, University of Duisberg


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