Meaning, Thought and Reality

2.1 Introduction

In this chapter we look at the basic question of how it is that we can use language to describe the world. How is it possible for example, that by uttering strings of sounds I can convey information to a listener about what is happening in a scene, say, outside my window? Clearly all languages allow speakers to describe, or as we might say model, aspects of what they perceive. We routinely pick out, for example, individuals or locations, as in:

2.1 I saw **Nelson Mandela** on television last night.

2.2 We've just flown back from **Paris.**

where *Nelson Mandela* and *Paris* are names allowing us to do this. In semantics this action of picking out or identifying with words is often called **referring** or **denoting.** Thus one can use the word *Paris* to **refer** to or **denote** the city. The entity referred to, in this case the city, is usually called the **referent** (or more awkwardly, the **denotatum).** Some writers, like John Lyons (1977: 396-409), separate the terms **refer** and **denote.** For these writers **denote** is used for the relationship between a linguistic expression and the world, while **refer** is used for the action of a speaker in picking out entities

in the world. We will adopt this usage, so that if I say *A sparrow flew into the room*, I am using the two noun phrases *a sparrow* and *the room* to refer to things in the world, while the nouns *sparrow* and *room* denote certain classes of items. In other words, referring is what speakers do, while denoting is a property of words. Another difference which follows from these definitions is that denotation is a stable relationship in a language which is not dependent on any one use of a word. Reference, on the other hand is a moment-by-moment relationship: what entity somebody refers to by using the word *sparrow* depends on the context.

As we shall see, there are different views of how semanticists should approach this ability to talk about the world. Two of these are particularly important in current semantic theories: we can call them the **referential** (or **denotational**) approach and the **representational** approach. For semanticists adopting the first approach this action of putting words into relationship with the world *is* meaning, so that to provide a semantic description for a language we need to show how the expressions of the language can 'hook onto' the world.

Thus theories of meaning can be called **referential** (or **denotational)** when their basic premise is that we can give the meaning of words and sentences by showing how they relate to situations. Nouns, for example, are meaningful because they denote entities in the world and sentences because they denote situations and events.[1] In this approach, the difference in meaning between the sentences:

2.3 There is a casino in Grafton Street.

2.4 There isn't a casino in Grafton Street.

arises from the fact that the two sentences describe different situations. If we assume the sentences were spoken at the same time about the same street, then they can be said to be incompatible, i.e. one of them is a false description of the situation.

For semanticists adopting the second approach our ability to talk about the world depends on our mental models of it. In this view a language represents a theory about reality: about the types of things and situations in the world. Thus, as we shall see in later chapters, a speaker can choose to view the same situation in different ways. Example 2.5 below shows us that in English we can view the same situation as either an activity (2.5a) or as a state (2.5b):

2.5 a. Joan is sleeping.
b. Joan is asleep.

Such decisions are influenced by each language's conventional ways of viewing situations. We can compare the three ways of saying that someone has a cold in 2.6-8 below:

2.6 English
You have a cold.

2.7 Somali
Hargab baa ku haya.
a.cold FOCUS you.has
'A cold has you.' i.e. 'You have a cold.'

2.8 Irish
Ta slaghdan ort.
is a. cold on.you
'A cold is on you.' i.e. 'You have a cold.'

In English and Somali, 2.6 and 2.7, we see the situation viewed as **possession:** in English the person possesses the disease; in Somali the disease possesses the person. In Irish, 2.8, the situation is viewed as **location:** the person is the location for the disease. We shall look at such differences in later chapters. The point here is that different conceptualizations influence the description of the real-world situations. Theories of meaning can be called **representational** when their emphasis is on the way that our reports about reality are influenced by the conceptual structures conventionalized in our language.

We can see these two approaches as focusing on different aspects of the same process: talking about the world. In referential theories, meaning derives from language being attached to, or grounded in, reality. In representational approaches meaning derives from language being a reflection of our conceptual structures. This difference of approach will surface throughout this book and we outline a specific referential theory in chapter 10, and versions of representational theories in chapters 9 and 11. These two approaches are influenced by ideas from philosophy and psychology and in this chapter we review some of the most important of these. We begin however with language: by looking at the different ways linguistic expressions can be used to refer. We then go on to ask whether reference is indeed all of meaning and examine arguments that reference relies on conceptual knowledge. Here we review some basic theories about concepts from the philosophical and psychological literature. Finally we discuss how these ideas from philosophy and psychology have influenced the ways that semanticists view' the task of describing meaning.

2.2 Reference

2.2.1 Types of reference

We can begin our discussion by looking briefly at some major differences in the ways that words may be used to refer. For the introductory purposes

of this chapter we will for the most part confine our discussion to the referential possibilities of names and noun phrases, which together we can call **nominals,** since the nominal is the linguistic unit which most clearly reveals this function of language. Later, in chapter 10, we look at a more fully fledged theory of denotation and discuss the denotations of other linguistic elements like verbs and sentences. In this section we discuss some basic distinctions in reference.

Referring and non-referring expressions

We can apply this distinction in two ways. Firstly there are linguistic expressions which can never be used to refer, for example the words *so, very, maybe, if not, all.* These words do of course contribute meaning to the sentences they occur in and thus help sentences denote, but they do not themselves identify entities in the world. We will say that these are intrinsically non-referring items. By contrast, when someone says the noun *cat* in a sentence like *That cat looks vicious,* the noun is a referring expression since it is being used to identify an entity. So nouns are potentially referring expressions.

The second use of the distinction *referring/non-referring* concerns potentially referring elements like nouns: it distinguishes between instances when speakers use them to refer and instances when they do not. For example, the indefinite noun phrase *a cholecystectomy* is a referring expression in the following sentence:

2.9 They performed a cholecystectomy this morning.

where the speaker is referring to an individual operation but not in:

2.10 A cholecystectomy is a serious procedure.

where the nominal has a generic interpretation. Some sentences can be ambiguous between a referring and a non-referring reading, as is well known to film writers. Our hero, on the trail of a missing woman, is the recipient of leers, or offers, when he tells a barman *I³m looking for a woman. We* know, but the barman doesn't, that our hero won't be satisfied by the non-referring reading.

Constant versus variable reference

One difference among referring expressions becomes clear when we look at how they are used across a range of different utterances. Some expressions will have the same referent across a range of utterances, e.g. *the Eiffel Tower* or *the Pacific Ocean.* Others have their reference totally dependent on context, for example the items in bold below, where to identify the referents we need to know who is speaking to whom, etc.:

2.11 **I** wrote to **you.**

2.12 **She** put **it** in **my office.**

Expressions like *the Pacific Ocean* are sometimes described as having **constant reference,** while expressions like *I, you, she,* etc. are said to have **variable reference.** To identify who is being referred to by pronouns like *she, I, you,* etc. we obviously need to know a lot about the context in which these words were uttered. We look at such context-dependent elements in chapter 7, where we will use the term **deixis,** a term from Greek meaning roughly 'pointing', as a label for words whose denotational capability so obviously needs contextual support.

In fact, though, our examples so far turn out to be the extreme cases. As we shall see in chapter 7, most acts of referring rely on some contextual information: for example, to identify the referent of the nominal *the President of the United States* we need to know when it was uttered.

Referents and extensions

So far we have been looking at referential differences between expressions. We can also make useful distinctions among the things referred to by expressions. We use the term **referent** of an expression for the thing picked out by uttering the expression in a particular context; so the referent of *the capital of Nigeria* would be, since 1991, the city of Abuja. Similarly, the referent of *a toad* in *I've just stepped on a toad* would be the unfortunate animal on the bottom of my shoe.

The term **extension** of an expression is the set of things which could possibly be the referent of that expression. So the extension of the word *toad* is the set of all toads. As mentioned earlier, in the terminology of Lyons (1977), the relationship between an expression and its extension is called **denotation**.

As we mentioned, names and noun phrases, which together we can call nominals, are the paradigmatic case of linguistic elements used to refer. In the next sections we outline some of the main ways that nominals are used to refer. The referential uses of different nominals has, of course, been an important area of investigation in the philosophy of language and there is a large literature on names, common nouns, definite nominals, etc. We won't attempt to cover the philosophical arguments in detail here: we will just touch on some major aspects of nominal reference.[2]

2.2.2 Names

The simplest case of nominals which have reference might seem to be names. Names after all are labels for people, places, etc. and often seem to have

little other meaning. It does not seem reasonable to ask what the meaning of *Karl Marx* is, other than helping us to talk about an individual.

Of course, context is important in the use of names: names are definite in that they carry the speaker's assumption that her audience can identify the referent. So if someone says to you:

2.13 He looks just like Eddie Murphy.

the speaker is assuming you can identify the American comedian.

But even granting the speaker's calculation of such knowledge, how do names work? This, like most issues in semantics, turns out to be not quite as simple a question as it seems and we might briefly look at a couple of suggestions from the philosophical literature.

One important approach can be termed the **description theory,** associated in various forms with Russell (1967), Frege (1980) and Searle (1958). Here a name is taken as a label or shorthand for knowledge about the referent, or in the terminology of philosophers, for one or more definite descriptions. So for *Christopher Marlowe*, for example, we might have such descriptions as *The writer of the play Dr Faustus* or *The Elizabethan playwright murdered in a Deptford tavern.* In this theory understanding a name and identifying the referent are both dependent on associating the name with the right description.

Another, very interesting, explanation is the **causal theory** espoused by Devitt and Sterelny (1987), and based on the ideas of Kripke (1980) and Donnellan (1972).This theory is based on the idea that names are socially inherited, or borrowed. At some original point, or points, a name is given, let us say to a person, perhaps in a formal ceremony. People actually present at this begin to use this name and thereafter, depending on the fate of the named person and this original group, the name may be passed on to other people. In the case of a person who achieves prominence, the name might be used by thousands or millions of people who have never met or seen the named person, or know very little about him. So the users of the name form a kind of chain back to an original naming or **grounding.** This is a very simplified sketch of this theory: for example, Devitt and Sterelny (1987: 6 Iff.) argue that in some cases a name does not get attached by a single grounding. It may arise from a period of repeated uses. Sometimes there are competing names and one wins out; or mistakes may be made and subsequently fixed by public practice. The great advantage of this causal theory is that it recognizes that speakers may use names with very little knowledge of the referent. It is easy to think of examples of historical figures whose names we might bandy about impressively, but, sadly for our education, about whom we might be hard pressed to say anything factual.

So where the causal theory stresses the role of social knowledge in the use of names, the description theory emphasizes the role of identifying knowledge. See Devitt and Sterelny (1987) for a detailed discussion of these proposals. The importance of this debate is that the treatment chosen for

names can be extended to other nominals like **natural kinds,** a term in the philosophy of language for nouns referring to classes which occur in nature, like *giraffe* or *gold* (see Schwartz 1979, 1980, Churchland 1985). We will look at this proposal later in this chapter.

2.2.3 Nouns and noun phrases

Nouns and noun phrases (NPs) can be used to refer: indefinite and definite NPs can operate like names to pick out an individual, e.g.

2.14 a. I spoke to *a woman* about the noise.
b. I spoke to *the woman* about the noise.

where of course the difference between the nominals hangs on whether the woman to whom the speaker refers is known to the listener and/or has been identified earlier in the conversation.

Definite noun phrases can also form definite descriptions where the referent is whoever or whatever fits the description, as in:

2.15 She has a crush on *the captain of the hockey team.*

An account of reference has to deal with cases where there is no referent to fit the definite description, as in Bertrand Russell's famous example:

2.16 *The King of France* is bald.

or where the referent is not real, for example *the man in the iron mask* or *the wizard of Oz.* We look at the problematic status of such sentences in chapter 4, when we discuss the semantic notion, **presupposition.**

NPs can also be used to refer to groups of individuals, either **distributively** where we focus on the individual members of the group, as in 2.17, or **collectively** when we focus on the aggregate, as in 2.18:

2.17 *The people in the lift* avoided each other's eyes.

2.18 *The people in the lift* proved too heavy for the lift motor.

As well as individuals and groups of individuals, nominals can of course denote substances^ actions and abstract ideas, e.g.

2.19 Who can afford *coffee?*

2.20 *Sleeping* is his hobby.

2.21 She has a passion for *justice.*

We will see some attempts to set up semantic classes of nominals to reflect such differences in chapter 9.

Some nominals are trickier in their denotational behaviour: for example the nominal *no student* in 2.22 below:

2.22 No student enjoyed the lecture.

where *no student* does not of course denote an individual who enjoyed the lecture. The meaning of this sentence can be paraphrased as in 2.23a, or in a logical framework we will investigate in chapter 10, as in 2.23b:

2.23 a. Of the students, not one enjoyed the lecture.
b. For each student x, x did not enjoy the lecture.

This complex denotational behaviour is characteristic of **quantifiers:** a class of words that in English includes *each, ally every, some, none, no.* These allow a speaker, among other things, the flexibility to predicate something of a whole class of entities, or of some subpart, for example:

2.24 *Every Frenchman* would recognize his face.

2.25 *Some Frenchmen* voted for him twice.

2.26 *A few Frenchmen* voted for him.

Speakers can combine quantifiers with negative words to produce some subtle effects; for example, the sentence:

2.27 Every American doesn't drink coffee.

which has an interpretation which is not 'The class of Americans does not drink coffee', but rather 'Not every American drinks coffee.' We will look at some proposals for describing the use of quantifiers in chapter 10. Having taken this brief look at the referential properties of nominals, in the next section we take up the more general issue of the role of reference in a theory of meaning.

2.3 Reference as a Theory of Meaning

As we observed earlier, perhaps the simplest theory of meaning is to claim that semantics *is* reference, i.e. that to give the meaning of a word one shows what it denotes. In its simplest form this theory would claim that reference picks out elements in the real world. As described by Ruth Kempson (1977: 13) such an approach might claim the following:

proper names	denote	individuals
common names	denote	sets of individuals
verbs	denote	actions
adjectives	denote	properties of individuals
adverbs	denote	properties of actions

As she points out, there are a number of problems with this simplest version as a theory of semantics. Firstly it seems to predict that many words have no meaning, for as we mentioned earlier, it is very difficult to find a real-world referent for words like *so, not, very, but, of.* A second problem is that many nominal expressions used by speakers do not have a referent that exists or has ever existed, as the elements in bold in 2.29-31 below:

2.29 In the painting **a unicorn** is ignoring a maiden.

2.30 **World War III** might be about to start.

2.31 **Father Christmas** might not visit you this year.

We would have to make the rather odd claim that expressions like *unicorn, World War III,* and *Father Christmas* are meaningless if meaning is taken to be a relation between words and items in the real world. If a speaker using these expressions is not referring to anything in reality, and such reference *is* meaning, how do sentences 2.29-31 have meaning? Since they clearly do, it seems that we must have a more sophisticated theory of meaning.

A further problem is that even when we are talking about things in the real world, there is not always a one-to-one correspondence between a linguistic expression and the item we want to identify. To take a simple example, we can refer to the same individual in different ways, as in:

2.32 Then in 1981 Anwar El Sadat was assassinated.

2.33 Then in 1981 the President of Egypt was assassinated.

In 2.32 and 2.33 the same individual is referred to by a **name,** Anwar El Sadat, and by a **definite description,** the President of Egypt. These two expressions would share the same referent but we probably want to say they have different meanings. If so, there is more to meaning than reference. One might object that names do not really have any meaning. This is often so in English, where we commonly use names derived from other languages like Hebrew, Greek, etc., but is not necessarily true of other cultures. Still, even if we allow this objection, the phenomenon is not restricted to names. You might refer to the woman who lives next door to you by various descriptions like *my neighbour, Pat's mother, Michael's wife, the Head of Science at St Helen's School,* etc. It seems clear that while these expressions might all refer to the same individual, they differ in meaning. Indeed it is possible

to know that some nominal expressions refer to an individual but be ignorant of others that do. We might understand expressions like *the President of the United States* and *the Commander-in-Chief of the United States Armed Forces* but not know that they both refer to the same man. This has traditionally been an issue in the philosophical literature where we can find similar but more complicated examples: the logician Gottlob Frege (1980) pointed out that a speaker might understand the expressions *the morning star* and *the evening star* and use them to refer to two apparently different celestial bodies without knowing that they both refer to sightings of Venus. For such a speaker, Frege noted, the following sentence would not be a tautology:

2.34 The morning star is the evening star.

and might have a very different meaning from the referentially equivalent sentence (but for our hypothetical speaker, much less informative):

2.35 Venus is Venus.

If we can understand and use expressions that do not have a real-world referent, and we can use different expressions to identify the same referent, and even use two expressions without being aware that they share the same referent, then it seems likely that meaning and reference are not exactly the same thing. Or to put it another way; there is more to meaning than reference. How should we characterize this extra dimension? One answer is to follow Frege in distinguishing two aspects of our semantic knowledge of an expression: its **sense** (Frege used the German word *Sinn*) and its **reference** (Frege's *Bedeutung).* In this division, sense is primary in that it allows reference: it is because we understand the expression *the President of Ireland* that we can use it to refer to a particular individual at any given time. Other ways of describing this same person will differ in sense but have the same reference.[3]

If we follow this line of argument, then our semantic theory is going to be more complicated than the simple referential theory: the meaning of an expression will arise both from its sense and its reference. In the next section, we discuss some suggestions of what this sense element may be like.

2.4 Mental Representations

2.4.1 Introduction

In the last section we concluded that although reference is an important function of language, the evidence suggests that there must be more to meaning than simply denotation. We adopted the convention of calling this extra dimension **sense.**[4] In the rest of this chapter we explore the view that

sense places a new level between words and the world: a level of mental representation.[5] Thus, a noun is said to gain its ability to denote because it is associated with something in the speaker/hearer's mind. This gets us out of the problem of insisting everything we talk about exists in reality, but it raises the question of what these mental representations are. One simple and very old idea is that these mental entities are images. Presumably the relationship between the mental representation (the image) and the real-world entity would then be one of resemblance; see Kempson (1977) for discussion. This might conceivably work for expressions like *Paris* or *your mother,* it might also work for imaginary entities like *Batman.* This theory however runs into serious problems with common nouns. This is because of the variation in images that different speakers might have of a common noun like *car* or *house* depending on their experience. One example often cited in the literature is of the word *triangle',* one speaker may have a mental image of an equilateral triangle, another might be isosceles or scalene. It is difficult to conceive of an image which would combine the features shared by all triangles, just as it is difficult to have an image which corresponds to all cars or dogs. This is to ignore the difficulties of what kind of image one might have for words like *animal* or *food',* or worse *love, justice* or *democracy.* So even if images are associated with some words, they cannot be the whole story.

The most usual modification of the image theory is to hypothesize that the sense of some words, while mental, is not visual but a more abstract element: a concept. This has the advantage that we can accept that a concept might be able to contain the non-visual features which make a dog a dog, democracy democracy, etc. We might also feel confident about coming up with a propositional definition of a triangle, something corresponding to 'three-sided polygon, classifiable by its angles or sides'. Another advantage for linguists is that they might be able to pass on some of the labour of describing concepts to psychologists rather than have to do it all themselves. Some concepts might be simple and related to perceptual stimuli - like SUN,[6] WATER, etc. Others will be complex concepts like MARRIAGE or RETIREMENT which involve whole theories or cultural complexes.

This seems reasonable enough but the problem for many linguists is that psychologists are still very involved in investigating what concepts might be like. Unless we have a good idea of what a concept is, we are left with rather empty definitions like 'the sense of the word *dog* is the concept DoG.'

It is at this point that different groups of linguists part company. Some, like Kempson in the quotation below (1977: 16-17) have seemed sceptical of psychologists' success and do not see much point in basing a theory of meaning on reference, if reference is based on concepts:

2.36 What is involved in this claim that a word has as its meaning a 'convenient capsule of thought' [Edward Sapir's definition of meaning]? If this is a retraction from an image theory of meaning, as it is, then it is a retraction from a specific, false claim to one that is

> entirely untestable and hence vacuous. It does no more than substitute for the problem term *meaning* the equally opaque term *concept.*

Kempson makes this point as part of an argument for a denotational semantics and in favour of modelling sense in a formal, rather than psychological way. Linguists who favour a representational approach have gone on to set up models of concepts to form the basis of semantics, throwing linguistic light onto a traditional line of research in cognitive psychology. There are a number of proposals for conceptual structure in the semantics literature; we shall look at some details of these later, especially in chapters 9 and 11. For now we can follow this representation line of enquiry and briefly examine some basic approaches from the psychological literature to the task of describing concepts.

2.4.2 Concepts

If we adopt the hypothesis that the meaning of, say a noun, is a combination of its denotation and a conceptual element, then from the point of view of a linguist, two basic questions about the conceptual element are:

1 What form can we assign to concepts?
2 How do children acquire them, along with their linguistic labels?

We can look at some answers to these questions. In our discussion we will concentrate on concepts that correspond to a single word, i.e. that are **lexicalized**. Of course not all concepts are like this: some concepts are described by phrases, as the underlined concept in 2.37 below:

2.37 On the shopping channel, I saw a tool for compacting dead leaves into garden statuary.

We can speculate that the reason why some concepts are lexicalized and others not is **utility.** If we refer to something enough it will become lexicalized. Possibly somebody once said something like 2.38 below:

2.38 We're designing a device for cooking food by microwaves.

describing something that for a while was given the two-word label *microwave oven*^ but is now usually called just a wncrotwwe. Presumably if every home ends up having a tool to turn leaves into statues, a name for it will be invented and catch on. We see this process happening all the time of course as new concepts are invented and new words or new senses of old words given to them. An example of such a recent introduction is *phreaking,* now to be found in print-and dictionaries with its colloquial meaning 'gaining unauthorized access into telecommunications systems, for example to avoid paying telephone call charges'. Someone who does this is, naturally, a *phreak.* For the rest of this chapter we deal only with such lexicalized concepts.

When we talk of children acquiring concepts we have to recognize that their concepts may differ from the concepts of adults. Work in developmental psychology has shown that children may operate with concepts that are quite different: students of child language describe children both **underextending** concepts, as when for a child *dog* can only be used for their pet, not the one next door; and **overextending** concepts, where a child uses *daddy* for every male adult, or *cat* for cats, rabbits and other pets. Or the concepts may be just different, reflecting the fact that items in a child's world may have different salience than for an adult. See Mervis (1987), Keil (1989) and Markman (1989) for discussion of the relationship between child and adult categorization.

2.4.3 Necessary and sufficient conditions

One traditional approach to describing concepts is to define them by using sets of **necessary and sufficient conditions.** This approach comes from thinking about concepts as follows. If we have a concept like WOMAN, it must contain the information necessary to decide when something in the world is a woman or not. How can this information be organized? Perhaps as a set of characteristics or attributes, i.e.:

2.39 x is a woman if and only if *L.*

where *L* is a list of attributes, like:

2.40 x is human;
x is adult;
x is female, etc.

One can see these attributes as conditions: if something must have them to be a woman, then they can be called necessary conditions. In addition, if we can find the right set, so that just that set is enough to define a woman, then they can be called sufficient conditions, i.e. we have identified the right amount of information for the concept.

So this theory views concepts as lists of bits of knowledge: the necessary and sufficient conditions for something to be an example of that concept. One major problem with this approach has been that it seems to assume that if speakers share the same concept they will agree on the necessary and sufficient conditions: if something has them, it is an X; if not, not. But it has proved difficult to set these up even for nouns which identify concrete and natural kinds like *dog* or *cat.* Let us take as an example the noun *zebra.* We might agree on some attributes:

2.41 is an animal,
has four legs,
is striped,
is a herbivore, etc.

The problem we face though is: which of these is necessary? The first obviously; but the rest are more problematic. If we find in a herd of zebra, one that is pure white or black, we might still want to call it a zebra. Or if by some birth defect, a three-legged zebra comes into the world, it would still be a zebra. Similarly, if a single zebra got bored with a grass diet and started to include a few insects, would it cease to be a zebra? These, you might think, are rather whimsical questions, perhaps problems for philosophers rather than linguists, and indeed this zebra example is just a version of Saul Kripke's example about tigers (Kripke 1980: 119-21), or Putnam's fantasy about cats (Putnam 1962). If we suddenly discovered that cats had always been automata rather than animals, would the meaning of the word *cat* be different? Questions such as these have important consequences for our ideas about concepts: if we cannot establish a mutual definition of a concept, how can we use its linguistic label?

Another argument against necessary and sufficient conditions as the basis for linguistic concepts is Putnam's (1975) observations about ignorance. Speakers often use words to refer knowing very little, and sometimes nothing, about the identifying characteristics of the referent. Putnam's examples include the tree names *beech* and *elm*\ like Putnam, many English speakers cannot distinguish between these two trees yet use the words regularly. Such a speaker would presumably be understood, and be speaking truthfully, if she said:

2.42 In the 1970s Dutch elm disease killed a huge number of British elms.

Perhaps as Putnam suggests, we rely on a belief that somewhere there are experts who do have such knowledge and can tell the difference between different species of tree. In any case it seems, as with other natural kind terms like *gold* or *platinum,* we can use the words without knowing very much about the referent. It seems unlikely then that a word is referring to a concept composed of a set of necessary and sufficient conditions, or what amounts to the same thing, a **definition.**

This is reminiscent of our earlier discussion of the use of names. There we saw that one of the advantages claimed for the causal theory of names over the description theory is that it allows for speaker ignorance: we can use a name for a person or place knowing little or nothing about the referent. This parallel is overtly recognized by writers such as Putnam (1975) and Kripke (1980), who have proposed that the causal theory be extended to natural kind terms. The idea is that natural kind terms, like names, are originally fixed by contact with examples of the kind. Thereafter, speakers

may receive or borrow the word without being exposed to the real thing, or knowing very much about its characteristics. As we have seen, philosophers like to use examples of metals like gold or silver. Any inability to identify correctly or define the substance silver does not prevent one from using the word *silver.* We assume that someone once had the ability or need to recognize the individual metal and that somewhere there are experts who can identify it empirically. The latter is Putnam's 'division of labour' in a speech community: between 'expert' and 'folk' uses of a term. Only the expert or scientific uses of a word would ever be rigorous enough to support necessary and sufficient conditions, but speakers happily go on using the word.

2.4.4 Prototypes

Because of problems with necessary and sufficient conditions, or definitions, several more sophisticated theories of concepts have been proposed. One influential proposal is due to Eleanor Rosch and her co-workers (e.g. Rosch 1973b, 1975, Rosch and Mervis (1975, Rosch et al. 1976) who have suggested the notion of **prototypes.** This is a model of concepts which views them as structured so that there are central or typical members of a category, such as BIRD or FURNITURE, but then a shading off into less typical or peripheral members. So *chair* is a more central member of the category FURNITURE than *lamp,* for example. Or *sparrow* a more typical member of the category BIRD thanThis approach seems to have been supported by Rosch's experimental evidence: speakers tend to agree more readily on typical members than on less typical members; they come to mind more quickly, etc. Another result of this and similar work (e.g. Labov 1973) is that the boundaries between concepts can seem to speakers uncertain, or 'fuzzy', rather than clearly defined.

This approach allows for borderline uncertainty: an item in the world might bear some resemblance to two different prototypes. Here we might recall our hypothetical example in chapter 1 of an English speaker being able to use the word *whale* yet being unsure about whether a whale is a mammal or fish. In the prototype theory of concepts, this might be explained by the fact that whales are not typical of the category MAMMAL, being far from the central prototype. At the same time, whales resemble prototypical fish in some characteristic features: they live underwater in the oceans, have fins, etc.

There are a number of interpretations of these typicality effects in the psychology literature: some researchers for example have argued that the central prototype is an abstraction. This abstraction might be a set of **characteristic features,** to which we compare real items; see Smith and Medin (1981) for discussion. These characteristic features of BIRD might describe a kind of average bird: small, perhaps, with wings, feathers, the ability to fly, etc. but of no particular species. Other researchers have proposed that we organize our categories by **exemplars,** memories of actual typical birds, say

sparrows, pigeons and hawks, and we compute the likelihood of something we meet being a bird on the basis of comparison with these memories of real birds. An overview of this area of investigation is given by Medin and Ross (1992).

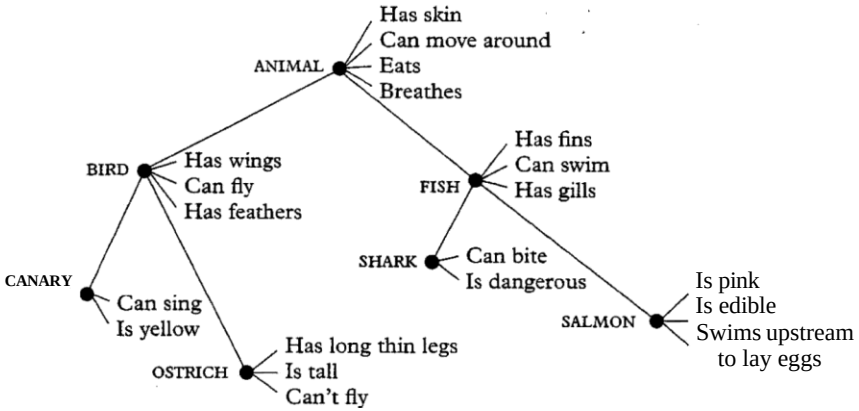
There is another approach to typicality effects from within linguistics, which is interesting because of the light it sheds on the relationship between linguistic knowledge and encyclopaedic knowledge, a topic we discussed in chapter 1. Charles Fillmore (1982b) and George Lakoff (1987) both make similar claims that speakers have folk theories about the world, based on their experience and rooted in their culture. These theories are called **frames** by Fillmore and **idealized cognitive models (ICMs)** by Lakoff.[7] They are not scientific theories or logically consistent definitions, but collections of cultural views. Fillmore gives an example of how these folk theories might work by using the word *bachelor.* It is clear that some bachelors are more prototypical than others, with the Pope, for example, being far from prototypical. Fillmore, like Lakoff in his discussion of the same point (1987: 68-71), suggests that there is a division of our knowledge about the word *bachelor:* part is a **dictionary**-type definition (perhaps simply [4]an unmarried man') and part is an **encyclopaedia-type** entry of cultural knowledge about bachelorhood and marriage - the frame or ICM. The first we can call linguistic or semantic knowledge and the second real-world or general knowledge. Their point is that we only apply the word *bachelor* within a typical marriage ICM: a monogamous union between eligible people, typically involving romantic love, etc. It is this idealized model, a form of general knowledge, which governs our use of the word *bachelor* and restrains us from applying it to celibate priests, or people living in isolation like Robinson Crusoe on his island or Tarzan living among apes in the jungle. In this view then using a word involves combining semantic knowledge and encyclopaedic knowledge, and this interaction may result in typicality effects.

Prototype theory,[8] frames and ICMs are just a few of the large number of proposals for conceptual structure. We will look at some suggestions from the specifically linguistics literature in later chapters.

2.4.5 Relations between concepts

One important issue that our discussion has bypassed so far is the **relational** nature of conceptual knowledge. We will see in chapter 3 that words are in a network of semantic links with other words and it is reasonable to assume that conceptual structures are similarly linked. Thus if all you know about *peccary* is that it is a kind of wild pig and of *pecorino* that it is a kind of Italian cheese, then your knowledge of these concepts /inherits' knowledge you have about pigs and cheese. This has implications for our earlier discussion of how much knowledge a speaker has to have in order to use a word. It suggests that the crucial element is not the amount of knowledge but its integration into existing knowledge. Thus, knowing that a peccary is

Figure *2.1* Conceptual networks



Source'. Collins and Quillian (1969: 241)

a kind of pig, together with what you know about pigs, is perhaps enough to begin to understand the meaning of sentences containing the word, and thereby to start to gain extra knowledge about the concept.

Such relations between concepts have been used to motivate models of **conceptual hierarchies** in the cognitive psychology literature. A model based on defining attributes was proposed by Collins and Quillian (1969). In this model, concepts are represented by nodes in a network, to which attributes can be attached and between which there are links. One such link is **inclusion** so that a subordinate node inherits attributes from a sup- erordinate node. An example of such a network is in figure 2.1. Here we can see that CANARY inherits the attributes of BIRD and ANIMAL and thus inherits the attributes *breathes, eats, has skin, has wings, can fly, has feathers.* We can see too that the Collins and Quillian model has the ability to block inheritance, so that for example OSTRICH does not inherit *can fly* from BIRD.

If the attributes in this model are taken to be the equivalent of the necessary and sufficient conditions we discussed earlier then it suffers from the disadvantages of that approach. Proponents of prototype theory, for example Rosch et al. (1976), have also investigated conceptual hierarchies and have proposed that such hierarchies contain three levels of generality: a superordinate level, a basic level and a subordinate level. The idea is that the levels differ in their balance between informativeness and usefulness. If we take one of Rosch et al.'s (1976) examples, that of furniture, the superordinate level is FURNITURE, which has relatively few characteristic features; the basic level would include concepts like CHAIR, which has more features, and the subordinate level would include concepts like ARMCHAIR, DINING CHAIR, etc., which have still more features and are thus more specific again. The basic level is identified as cognitively important: it is the level

that is most used in everyday life; it is acquired first by children; in experiments it is the level at which adults spontaneously name objects; such objects are recognized more quickly in tests, and so on.

This model has proved to be very robust in the psychological literature, though the simple picture we have presented here needs some modifications. It seems that the relationship between the basic level and the intermediate term might vary somewhat from domain to domain: man-made categories like FURNITURE differ somewhat from natural kind terms, and the relationship may vary depending on the person's experience of the categories. So a person's expert knowledge of a domain might influence the relationship between the basic and subordinate levels. See for example Tanaka and Taylor (1991) for a study suggesting that experts on dogs and birds might have a different, richer structure at subordinate levels for these categories from the average person.

2.4.6 Acquiring concepts

Our second basic issue was: how do we acquire concepts? One simple and intuitively satisfying theory is that we do it by **ostensive definition.** This is the idea that children (and adults) acquire concepts by being directed to examples in the world. So if you are walking with a child and you see a dog, you say *That's a dog* or *Look at the doggie!* and the child begins to acquire the concept DOG, which is filled out by subsequent experience of dogs.

This common-sense picture cannot be the whole story, however. The philosopher W. V. O. Quine has pointed out that ostension (defining by example) is usually couched in language. Quine's famous example is of walking with someone whose language you do not know, who when a rabbit runs past, says *Gavagai.* You do not know whether it is a warning or an instruction, or what the content might be: 'They are a menace', 'They are good to eat', 'Wow, that scared me', etc. To understand that you are being given a name you need to know something about the language that the ostension takes place in. So in English, a sentence frame like 'fr's *a'* tells you this. Similarly, you cannot even tell what is being pointed to without some linguistic support: is it the whole rabbit, its tail, or the way it is running? The point is that even ostensive definition depends on prior knowledge of some word meanings. Where, we may ask, do these come from? Are we forced to admit that we may be born with certain basic concepts innately within us? See J. A. Fodor (1975, 1980, 1981b) and Samet and Flanagan (1989) for discussion of these ideas. Once again, we will not try to deal with these issues in detail here; we can merely point out that the acquisition of concepts must be a more complicated process than simple ostension.

Our discussion in this section has focused on the relationship between words and concepts; in the next section we discuss the relationship between words and thinking in general.

2.5 Words, Concepts and Thinking

In our discussion so far, we have assumed a straightforward association between words and concepts: that is that a speaker has a store of lexicalized concepts which is of course smaller than the larger set that she is capable of thinking about or talking about, using phrases or sentences. There are though a number of positions that can be taken on the issue of the relationship between these lexicalized concepts and general thinking and reasoning. In this section we discuss two opposing views: the first, **linguistic relativity,** is that lexicalized concepts impose restrictions on possible ways of thinking; the second, the **language of thought** hypothesis, maintains that thinking and speaking, while obviously related, involve distinct levels of representation. There are strong and weak versions of both of these positions, but we will for clarity outline fairly strong versions.

2.5.1 Linguistic relativity

The notion of **linguistic relativity**, associated with Edward Sapir and Benjamin Lee Whorf, is an idea that has spread far outside the fields of anthropology and linguistics where it began. One reason perhaps is that it provides an explanation for a common experience when dealing with different languages. Writers translating between languages have often remarked on the lack of fit between words in two languages. For example, colour words might not have exactly the same range: does French *pourpre* describe the same range as English *purple?* Similarly, while the English verbs for putting on clothes (*put on, don,* etc.) make no distinction about the part of the body the clothing goes on, other languages like Japanese (as discussed by E. V. Clark 1983) and Korean (Choi and Bowerman 1992) have separate verbs for putting clothes on various parts of the body. It seems obvious too that words for social institutions and customs will vary between cultures. There is no easy translation in English for the Somali verb *maddooyeyso,* except the approximation: 'to play the children's game called *maddooyamaddooyo,* where an object is hidden in the hand and a special kind of rhyme is recited'.

The fact that language mirrors cultural differences became an important issue in the school of American anthropological linguistics which followed the work of the distinguished anthropologist Franz Boas. In one line of thought this idea of language as a mirror of culture developed into a much stronger idea: that people's thoughts are *determined* by the categories available to them in their language. We can follow this line of development, starting with the following famous quotation where we find Boas suggesting that different languages, reflecting their speakers' cultural practices, might embody different conceptual classifications of the world:

2.43 As an example of the manner in which terms that we express by independent words are grouped together under one concept, the Dakota language may be selected. The terms *naxta'ka* TO KICK, *paxta'ka TO* BIND IN BUNDLES, *yaxta'ka* TO BITE, *ic'a'xtaka* TO BE NEAR TO, *boxta'ka TO* POUND, are all derived from the common element *xtaka* TO GRIP, which holds them together, while we use distinct words for expressing the various ideas.

It seems fairly evident that the selection of such simple terms must to a certain extent depend upon the chief interests of a people; and where it is necessary to distinguish a certain phenomenon in many aspects, which in the life of the people play each an entirely independent role, many independent words may develop, while in other cases modifications of a single term may suffice.

Thus it happens that each language, from the point of view of another language, may be arbitrary in its classifications; that what appears as a single simple idea in one language may be characterized by a series of distinct phonetic groups in another. (Boas 1966: 22)

Boas observed that the effect of this was largely unconscious because the use of language is largely an automatic process which we do not normally pause to reflect on.

These observations open the debate in this literature about the relationship between language, culture and thought. To what extent does the particular language we speak determine the way that we think about the world? Perhaps Boas's most famous student is the anthropologist and linguist Edward Sapir; in the following quotation, we see him proposing the view that the particular language we speak conditions our conceptualization of the world:

2.44 Language is a guide to 'social reality'… Human beings do not live in the objective world alone, nor alone in the world of social activity as ordinarily understood, but are very much at the mercy of the particular language which has become the medium of expression for their society… the 'real world' is to a large extent unconsciously built up on the language habits of the group. No two languages are ever sufficiently similar to be considered as representing the sartie social reality. The worlds in which different societies live are distinct worlds, not merely the same world with different labels attached …

We see and hear and otherwise experience very largely as we do because the language habits of our community predispose certain choices of interpretation … From this standpoint we may think of language as the *symbolic guide* to culture. (Sapir 1949b: 162)

It seems fair to say that Sapir had a stronger view of the determining role of language than Boas. Stronger still are the views of Benjamin Lee Whorf, a linguist well known for his work on native American languages, especially the Uto-Aztecan languages of the south west United States and Mexico. Whorf

strengthened this idea of the link between language and thought into the notion he called **linguistic relativity.** Its basic premise is that the way we think about the world is determined by our cultural and linguistic background:

2.45 We cut nature up, 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 through our speech community and is codified in the patterns of our language. The agreement is, of course, an implicit and unstated one, BUT ITS TERMS ARE ABSOLUTELY OBLIGATORY; we cannot talk at all except by subscribing to the organization and classification of data which the agreement decrees. (Whorf 1956: 213-14)

Whorf's observation is not restricted to word meaning; indeed, he believed that meanings derived from grammatical systems (e.g. notions of number and space in nouns, or aspect and tense in verbs)[10] were even stronger determinants of thought. The idea is that speakers can reflect on word meanings, but grammatical systems are largely unavailable to conscious reflection.

If this view is correct then our own language predisposes us to see both reality and other languages through its own filter. This would have serious implications for the prospects of a universal semantic theory. It might mean that we could always, with some difficulty and inexactitude, translate from one language to another. But if speaking different languages means that we think in different ways, how could we ever step outside our own language to set up a neutral metalanguage which does not privilege any particular language or language family? Such metalanguages are of course the basis for theories in other areas of linguistics like syntax or phonology.

2.5.2 The language of thought hypothesis

The idea of linguistic relativity is rejected by many linguists and researchers in **cognitive science,** the interdisciplinary study of intelligence which draws on cognitive psychology, computer science and linguistics. A typical response is to dismiss as a fallacy such a strict identification of thought and language. We can identify two main types of argument used to support this view. The first is that there is evidence of thinking without language; and the second is that linguistic analysis has shown us that language underspecifies meaning. We can look briefly at these two types of argument. A succinct presentation of the first type is given by Pinker (1994: 59ff.), who presents various kinds of evidence that thinking and language are not the same thing. He gives examples of evidence of thought processes, such as remembering and reasoning, which have been identified in psychological studies of human babies and of primates, both providing examples of creatures without language. He also recounts the various reports of artists and scientists who claim that their creativity sometimes derives from ideas which are non-linguistic images.

There is also evidence from psychological experiments of visual thinking: subjects seem able to manipulate images mentally, rotating them, scanning them, zooming in and out, etc., exhibiting a variety of mental processes which do not seem to involve language. Finally Pinker casts doubt on the various attempts in psychological experiments to suggest that people from different linguistic communities perform reasoning or other cognitive tasks in any very different ways.[11]

Such evidence for mental processes not involving language is often used to argue that cognitive processes do not employ a spoken language like English or Arabic but make use of a separate computational system in the mind: a **language of thought**. For a philosophical defence of this position see for example J. A. Fodor (1975, 1987). Stillings et al. (1995) provide a range of evidence from psychological experiments to support the same view. The basic idea is that memory and processes such as reasoning seem to make use of a kind of propositional representation that does not have the surface syntax of a spoken language like English.

Turning to the second type of argument - that language underspecifies meaning - some indirect support for this position emerges from the characteristic view of the communication of meaning that has emerged from research in semantics and pragmatics, as we shall see in the course of this book. It has become clear that meaning is richer than language at both ends, so to speak, of the communication process. Speakers compress their thoughts, and often imply rather than state explicitly what they mean, while hearers fill out their own version of the intended meaning from the language presented to them. This idea, that language underspecifies meaning and has to be enriched by hearers, would seem to fit naturally with the idea that speakers are putting their thoughts into language, i.e. translating into the spoken language, rather than simply voicing their thoughts directly. This does not of course provide direct evidence for this view: we could equally imagine English speakers thinking in English and still compressing their thoughts when speaking, on some grounds of economy and social cooperation.

Nonetheless these different types of argument are often taken, especially in cognitive science, to support the view that we think in a language of thought, sometimes called **Mentalese**. When we want to speak, we translate from Mentalese into our spoken language, be it Mohawk or Russian. One natural extension of this view is the proposal that everybody's Mentalese\is roughly the same; that is that the language of thought is universal. Thus we arrive at a position diametrically opposed to linguistic relativity: human beings have essentially the same cognitive architecture and mental processes, even though they speak different languages.[12]

2.5.3 Thought and reality

If we leave this question of the relation between words and thinking for the time being, we might ask whether semanticists must also consider questions

of the relationship between thought and reality. We can ask: must we as aspiring semanticists adopt for ourselves a position on traditional questions of **ontology,** the branch of philosophy that deals with the nature of being and the structure of reality, and **epistemology,** the branch of philosophy concerned with the nature of knowledge? For example, do we believe that reality exists independently of the workings of human minds? If not, we are adherents of **idealism.** If we do believe in an independent reality, can we perceive the world as it really is? One response is to say yes. We might assert that knowledge of reality is attainable and comes from correctly conceptualizing and categorizing the world. We could call this position **objectivism.** On the other hand we might believe that we can never perceive the world as it really is: that reality is only graspable through the conceptual filters derived from our biological and cultural evolution. We could explain the fact that we successfully interact with reality (run away from lions, shrink from fire, etc.) because of a notion of ecological viability. Crudely: that those with very inefficient conceptual systems (not afraid of lions or fire) died out and weren't our ancestors. We could call this position **mental constructivism:** we can't get to a God's eye view of reality because of the way we are made. These are of course very crude characterizations of difficult philosophical issues. By now any philosophers chancing on this text will have thrown it into the back of their own fire. But the relevance of these issues to semantics is that, as we shall see in later chapters, different theories of semantics often presuppose different answers to these very basic questions.

Still, for the linguist keen to describe the semantics of Swahili or English these are a heavy set of issues to deal with before getting on with the job, especially when added to the complex issues of conceptual representation that we discussed a little earlier. One understandable response is to decide that only language is the proper object of study for linguists and issues of mental representations and the existence of reality are best left to psychologists and philosophers. See for example the following comment by Charles Hockett:

2.46 We can leave to philosophers the argument whether the abstract relationships themselves have any sort of existence in the world outside of speech. Whatever they may decide, it is clear that the 'meaning' of a word like *and* or *the* ... is a very different thing from the meaning of a word like *morning* or *sunbeam.* (Hockett 1958: 263)

And we can see a similar sentiment in John Lyons's (1968) discussion of semantics:

2.47 semantics is, or ought to be, an empirical science, which as far as possible avoids commitment with respect to such philosophical and psychological disputes as the distinction of 'body' and 'mind' and the status of 'concepts'. This view will be accepted in the discussion of semantics given in this chapter. It should be stressed,

> however, that the methodological renunciation of 'mentalism' does not imply the acceptance of 'mechanism', as some linguists have suggested … The position that should be maintained by the linguist is one that is neutral with respect to 'mentalism' and 'mechanism'; a position that is consistent with both and implies neither. (1968: 408)

Thus some linguists have decided to leave the philosophical high ground to other disciplines, to put aside discussion of the reality of the world, and the nature of our mental representations of it, and to concentrate instead on the meaning relations between expressions within a language, or to try to compare meanings across languages. As we will see, this turning inward towards language, a position we could call **linguistic solipsism**,[13] leads to an interest in describing semantic relations like **ambiguity, synonymy, contradiction, antonymy,** etc., which we will look at in chapter 3. The decision is that it is more the task of linguists to describe, for example, how the meaning of the word *dog* is related to the words *animal* or *bitch* than to discuss what the mental concept of DoG might look like or how this relates to the real dogs running around in the world.

2.6 Summary

In this chapter we have seen that though it seems true that through language we can identify or refer to real world entities, it is difficult to use reference as the whole of a theory of meaning. We have seen that our semantic knowledge seems to include both **reference** and **sense.** We have seen that there are two different approaches to our ability to talk about the world: a **denotational** approach which emphasizes the links between language and external reality; and a **representational** approach which emphasizes the link between language and conceptual structure. Each approach has to answer certain key questions. For example, how do denotational approaches cope with our ability to talk about imaginary or hypothetical entities? Of representational approaches we might ask: do we need to establish a theory of conceptual structure in order to describe meaning? In this chapter we . have seen some aspects of such a task.

These issues of the relationship between language, thought and reality have typically led linguists to adopt one of three positions:

1 to leave these issues to philosophers and psychologists and decide that linguists should concentrate on **sense relations** within a language, or between languages;
2 to decide that meaning *is* essentially denotation and try to develop a theory to cope with the various types of reference we looked at earlier in 2.4, including the ability to talk about imagined situations;

3 to decide that meaning *does* rely on a theory of conceptual structure and go on to try to determine the nature of linguistic concepts.

We will see examples of each of these approaches in this book. The first is characteristic of traditional semantics and especially of lexical semantics, with its concentration on semantic relations like ambiguity, synonymy, and so on. We turn to these topics in chapter 3. The second approach, beefing up denotational theories to cope with the referential characteristics of different linguistic categories and the problems of mental entities, is characteristic of **formal semantics,** as we will describe in chapter 10. The third approach is characteristic of much recent work, as in Jackendoff's (1990) **conceptual semantics,** described in chapter 9, or **cognitive semantics,** which we turn to in chapter 11. Before we look in detail at these theories, in part II of this book we identify key areas of semantic description that any theory must come to terms with.

FURTHER READING

Devitt and Sterelny (1987) is an accessible overview of philosophical approaches to reference. Martin (1987) discusses the topics in this chapter as part of a general introduction to the philosophy of language. For an accessible introduction to Frege's distinction between sense and reference and its place in his philosophy see Kenny (1995). Stillings et al. (1995) review the issue of mental representations from the perspective of **cognitive science,** the name used for an interdisciplinary approach to mental representations and processes, drawing on research in cognitive psychology, computer science, philosophy of mind and linguistics. Taylor (2003) is a comprehensive discussion of the implications of prototype theory for linguistics. Medin and Ross (1992) and Eysenck and Keane (2005) give introductions to cognitive psychology which include accessible discussions of the nature of concepts. Margolis and Laurence (1999) provide a selection of important readings on concepts. An interesting collection of papers on the linguistic relativity hypothesis is Gumperz and Levinson (1996), which has useful introductory sections.

EXERCISES

2.1 Imagine the sentences below being spoken. Decide for each of the nominal expressions in bold, whether the speaker would be using the nominal to **refer.**

a. We waited for twelve hours at **Nairobi Airport.**
b. They had **lio food.**
c. Edward opened the cupboard and **a pair of shoes** fell out.

d. Henry is going to make **a cake.**
e. Doris passed through the office like **a whirlwind.**
f. He was run over by **a bus** in Donnybrook.
g. What we need is **an army of volunteers.**

2.2 Try to devise alternative descriptions for the **referents** of the nominals in bold below:

a. The Senator paid a visit to **the Ukrainian capital.**
b. **The British Prime Minister** refused to comment.
c. They arrived on **Christmas Day.**
d. Craig took a bus to **Washington DC.**
e. He had reached the summit of **the tallest mountain in the world.**

2.3 We discussed the **description theory of names.** We saw that this theory views the use of names as based on knowledge about the name bearer. Test this theory with the names below. For each name you recognize decide on two different descriptive sentences based on what you know about the individual.

a. Karl Marx
b. Alexander Graham Bell
c. Confucius
d. James Joyce
e. Alexander the Great
f. Indira Gandhi

Discuss too how a **causal theory** might explain your knowledge of these names. You might also discuss whether you think that some combination of these theories might be possible.

2.4 We discussed the traditional proposal that a concept can be defined by a set of **necessary and sufficient conditions,** where the right set of attributes might define a concept exactly. If words i are labels for concepts these attributes might also define word meaning. Lehrer (1974) discusses the definitions of words associated with cooking. Some of her examples are in the two groups below. For each word try to establish sets of attributes that would distinguish it from its companions in the group.

a. cake biscuit/cookie bread roll bun cracker
b. boil fry broil saute simmer grill roast.

2.5 We discussed the **prototype** theory of concepts. Assume that each of the following is a label for a concept, and suggest a list of **characteristic features** for the concept's prototype. Discuss some actual examples of members of the category and grade them for typicality, as we graded *sparrow* and *penguin* as examples of BIRD.

a. VEHICLE
b. HOME
C. WORK
d. MOTHER
e. SCIENCE

2.6 Using paraphrases, describe what is odd about the following exchanges:

a. A: No American came in here today.
B: What did he say?

b. A: This sandwich is better than nothing.
B: You're right. Nothing is worse than that sandwich.

c. A: Everybody doesn't know that.
B: Well then, let's tell everybody.

NOTES

1 In chapter 10, Formal Semantics, we outline a Fregean-style denotational semantics, where nouns denote entities, predicates denote sets of entities, and sentences denote a truth-value - a true or false match with a situation.
2 For accessible introductions to the topics of naming and reference in the philosophical literature, see Devitt and Sterelny (1987), and Macnamara (1982).
3 See the articles in Frege (1980) for discussion.
4 In cognitive psychology and formal semantics a term **intension** is used for a similar notion. In this usage the intension of a concept or a word is the set of criteria for identifying the concept together with the properties which relate it to other concepts.
5 Note that this implies that the sense of a word is a conceptual representation in an individual's mind. This is somewhat different from Frege's emphasis on sense as a means of determining reference that is objective, public and independent of any one individual mind. See Kenny (1995) for a brief discussion and Dummett (1981) for a detailed exposition.
6 Since in this section we will be talking about words, concepts, and things in the world, and the relation between them, we will adopt a typographical convention

to help us keep them apart: words will be in italics (dog); concepts in small capitals (DoG) and things in the world in plain type (dog).

7 These proposals are similar to a number of suggestions within cognitive science for representing knowledge: an example is Minsky's (1977) frames. See Stillings et al. (1995) for an overview of such proposals. The idea that concepts are based on knowledge and theories about the world has been discussed in psychology by several writers, for example Murphy and Medin (1985) and Keil (1987).

8 See Taylor (2003) for a detailed discussion of prototype theory and a suggestion that this structure is not limited to word meaning but is characteristic of all linguistic categories, even in syntax and phonology.

9 We discuss the comparison of colour words in different languages in section 3.7 later.

10 We will discuss these notions of tense, aspect, etc. in later chapters.

11 Such a study is Kay and Kempton's (1984) experiment comparing speakers of English and Tarahumara (a Uto-Aztecan language of Mexico) and their abilities to sort and compare coloured chips in colour ranges where the two languages differ.

12 This view also fits in well with the influential hypothesis of the **modularity of mind:** that is that there are separate and self-contained faculties of mind, of which language is one. In this view, these faculties function independently from one another and from general cognition; they are dedicated to only one kind of input (e.g. language; facial recognition); and they are not under conscious control. See J. A. Fodor (1983) for discussion.

13 Here we are borrowing and adapting Putnam's (1975) term **methodological solipsism,** as discussed in J. A. Fodor (1981a). Putnam applies the term to psychological research: here we use the term **linguistic solipsism** to describe a decision to focus on language-internal issues, ignoring the connections to thought and/or to the world.