

8 Word study strategies

This chapter looks at the word study strategies of using word parts, dictionaries and word cards. These are all intentional approaches to vocabulary learning and fit within the strand of language focused learning.

Word parts

Most of the content words of English can change their form by adding prefixes or suffixes. These affixes are typically divided into two types: inflectional and derivational. The inflectional affixes in English are all suffixes. They include *-s* (plural), *-ed*, *-ing*, *-s* (3rd person singular), *-s* (possessive), *-er* (comparative), *-est* (superlative). Unlike most derivational suffixes, inflections do not change the part of speech of the word or word group they are attached to and are added after a derivational suffix, if the word has one.

Derivational affixes in English include prefixes and suffixes. Most of the derivational suffixes and a few prefixes change the part of speech of the word they are added to (happy (adjective) / *happiness* (noun); able (adjective) / *enable* (verb)). Some of the affixes, especially prefixes, also alter the meaning of the word in a substantial way (judge/*pre*-judge; happy/*un*happy; care/*careless*). Words which contain affixes are sometimes called complex words.

Researchers on the vocabulary growth of native speakers of English usually distinguish three main ways in which a learner's vocabulary increases: through being taught or deliberately learning new words, through learning new words by meeting them in context, and through recognising and building new words by gaining control of prefixes, suffixes and other word building devices. In this chapter we look at the extent to which word building affects vocabulary size, the psychological reality of the relationship between inflected and derived words and their stem form, and the teaching and learning options for gaining control of English word building processes.

A knowledge of affixes and roots has two values for a learner of English: it can be used to help the learning of unfamiliar words by relating these words to known words or to known prefixes and suffixes, and it can be used as a way of checking whether an unfamiliar word has been successfully guessed from context.

Is it worthwhile learning word parts?

One way to answer this question is to approach it in the same way we approached the learning of vocabulary, that is, from the point of view of cost/benefit analysis. Is the effort of learning word parts repaid by the opportunity to meet and make use of these parts?

There are numerous studies of English affixes. Some have attempted to calculate the proportion of English words originating from Latin, Greek, Anglo-Saxon, Celtic and other sources (Grinstead, 1924; Roberts, 1965; Bird, 1987 and 1990). Their studies relate to affixation because a large proportion of the words coming from Latin or Greek make use of affixes. Other studies (Nagy and Anderson, 1984; White, Power and White, 1989) look at the proportion of words with affixes in a particular corpus. Other studies (Thorndike, 1941; Stauffer, 1942; Bock, 1948; Harwood and Wright, 1956; Becker, Dixon and Anderson-Inman, 1980; Bauer and Nation, 1993) give the frequency of particular affixes within a corpus. They all confirm the frequent, widespread occurrence of derivational affixes. White, Power and White's (1989) study of the four prefixes *un-*, *re-*, *in-*, *dis-* found that approximately 60% of words with those prefixes could be understood from knowing the commonest meaning of the base word. Allowing for help from context and knowledge of the less common meanings of the prefixes, approximately 80% of prefixed words could be understood.

Studies of the sources of English vocabulary

Bird (1987 and 1990) after a careful and detailed analysis of the 7,476 word type entries in the ranked vocabulary list of items with a frequency of ten per million and above in the *LOB* corpus, (Johansson and Hofland, 1989) concluded that 97% of these words were derived from approximately 2,000 roots. He found, as Roberts (1965) did, that the most frequent one thousand words of English contain around 570 words of Germanic origin, but thereafter the Germanic words drop to around 360 per thousand. The words derived from French and Latin make up 36% of the first 1,000 and thereafter about 51% (see Table 8.1).

Some of the word parts that Bird (1987) analysed have a form that

Table 8.1. Sources of the most frequent 7,476 words of English (from Bird, 1987)

	1st 100	1st 1,000	2nd 1,000	from then on
Germanic	97%	57%	39%	36%
Italic	3%	36%	51%	51%
Hellenic	0	4%	4%	7%
Others	0	3%	6%	6%

does not change in different words, such as *-ness*. Many of the others require considerable imagination and effort to see a connection, for example, *cap(ut)* = 'head', which occurs in *capital*, *cap*, *cape*, *escape*, *cattle*, *chapel*, *chief*, *achieve*. Bird's figures roughly parallel the findings of Roberts (1965) and Grinstead (1924), with words of Germanic origin predominating in the first 1,000 and Italic and Hellenic words predominating from the second 1,000 onwards, averaging around 60% of English vocabulary.

Studies of the proportion of affixed words

Nagy and Anderson's (1984) study of the word families in a section of the list based on the *American Heritage* corpus (Carroll, Davies and Richman, 1971) is a classic of its kind. Their goal was to see how many word families the sample, and by extrapolation all printed school English, contained. To find this they classified the formally related words in their sample into word families using a scale of meaning relatedness. In doing the classification, they carefully distinguished the different types of word family members. Table 8.2 presents some of their data for types involving affixes.

Table 8.2 shows that 21.9% (roughly one fifth) of the different types in a written text are inflected and 12.8% (roughly one eighth) have a derivational affix.

Table 8.3 shows how affixation affects the membership of a typical word family.

'Other minor variations' includes alternative spellings and pronunciations, capitalisation, truncations and abbreviations.

Table 8.3 gives figures for the average number of affixed members in a word family. The first column of figures uses an inclusive flexible definition of what can be in a word family, including less transparent derivatives such as *visually/visualize*, *percent/percentile*, *fend/fender*. The second column uses a more exclusive definition, allowing only

Table 8.2. *Percentage of inflected and derived types in a corpus of texts*

Suffixation	7.6%
Prefixation	4.0%
Derived proper names	1.2%
Total derived forms	12.8%
Regular inflections	16.9%
Irregular inflections	0.3%
Inflections with proper names	4.7%
Total inflections	21.9%

Table 8.3. *The base and affixed members of a typical word family*

Word type	Inclusive definition	Only closely related items	Examples	
			1.	2.
Base word	1.00	1.00	think	sure
Regular inflections	1.90	1.16	thinks, thinking	surer, surest
Irregular inflections	0.70	0.20	thought	
Transparent derivatives	2.57	1.57	thinker, unthinking	surely, ensure
Less transparent derivatives	1.65		unthinkable	surety, assure
Other minor variations	1.46	0.89	t'ink	Sure
Total types in a family	7.64	4.66		

very transparently related family members. The figures for each category of word type differ because in the second column the less transparent derivatives are excluded, being considered base words with their own set of family members. Thus the total number of word families is much greater in the second column for the same number of types, and so the average is smaller. For each base form there are on average between 1.5 and 4 derived forms (i.e. excluding inflections) depending on whether the inclusive or more strict definition of a family is used.

The evidence of the origins of English words and analysis of word forms in a corpus show that word parts are a very common and important aspect of English vocabulary.

Studies of the frequency of affixes

Thorndike's (1941) study of 90 English suffixes, like many subsequent studies, made use of his studies of word frequency. For each suffix,

Thorndike indicates how many words it occurs in – in total, and at various word frequency levels. He provides an average analysis score which represents the likelihood that a 16-year-old American child would recognise the affix in a word. Thorndike also provides an average inference score which is the ease of inferring what the word means from knowing that it equals the stem plus the suffix. Thorndike also lists the various meanings of the suffix showing how many suffixed words have that meaning and a word times frequency figure. Thorndike's monograph is a rich source of information about the value of the various suffixes and their particular uses in written English. Thorndike also makes recommendations for the teaching of the individual suffixes.

Bauer and Nation (1993) set up seven levels of affixes based on the criteria: frequency (the number of words in which the affix occurs), regularity (how much the written or spoken form of the stem or affix changes as a result of affixation), productivity (the likelihood of the affix being used to form new words) and predictability (the number and relative frequency of the different meanings of the affix).

Thorndike's study considered not only the number of words with a particular affix but also the frequency of each affixed word. Thorndike did not consider productivity. A comparison of Thorndike's figures with Bauer and Nation's levels shows a high degree of agreement. Bauer and Nation's levels 2 to 6 only include affixed forms where the stem can exist as an independent word (a free form). For example, *pretty* as in *prettyish* is a free form but *-ceipt* as in *recept* is a bound form, not a free form, because *ceipt* cannot exist as an independent word.

The frequency studies of Stauffer (1942), Bock (1948), Harwood and Wright (1954) and Becker, Dixon and Anderson-Inman (1980) simply consider the frequency of affixes with no consideration of different meanings, predictability, regularity or productivity. They show that a small number of affixes occur very frequently and account for a very high percentage of affix use. Stauffer (1942), for example, found that the 15 most common of the 61 prefixes he studied accounted for 82% of the total number of prefixed words in Thorndike's (1932) *Teacher's Word Book of 20,000 words*.

These studies all show that there is a relatively small group of very useful accessible affixes that learners could be introduced to at appropriate levels of their language development. Table 8.4 contains a recommended list divided into five stages. Stage 1 can be used with low intermediate learners.

The first four stages are based on levels 3 to 6 of Bauer and Nation (1993). Stage 5 is based on Stauffer (1942), Bock (1948) and

Table 8.4. A sequenced list of derivational affixes for learners of English

Stage 1

-able, -er, -ish, -less, -ly, -ness, -th, -y, non-, un- (all with restricted uses)

Stage 2

-al, -ation, -ess, -ful, -ism, -ist, -ity, -ize, -ment, -ous, in- (all with restricted uses)

Stage 3

-age (leakage), *-al* (arrival), *-ally* (idiotically), *-an* (American), *-ance* (clearance), *-ant* (consultant), *-ary* (revolutionary), *-atory* (confirmatory), *-dom* (kingdom, officialdom), *-eer* (black marketeer), *-en* (wooden), *-en* (widen), *-ence* (emergence), *-ent* (absorbent), *-ery* (bakery, trickery), *-ese* (Japanese), *-esque* (picturesque), *-ette* (usherette, roomette), *-hood* (childhood), *-i* (Israeli), *-ian* (phonetician, Johnsonian), *-ite* (Paisleyite; also chemical meaning), *-let* (coverlet), *-ling* (duckling), *-ly* (leisurely), *-most* (topmost), *-ory* (contradictory), *-ship* (studentship), *-ward* (homeward), *-ways* (crossways), *-wise* (endwise, discussion-wise), *anti-* (anti-inflation), *ante-* (anteroom), *arch-* (archbishop), *bi-* (biplane), *circum-* (circumnavigate), *counter-* (counter-attack), *en-* (encage, enslave), *ex-* (ex-president), *fore-* (forename), *hyper-* (hyperactive), *inter-* (inter-African, interweave), *mid-* (mid-week), *mis-* (misfit), *neo-* (neo-colonialism), *post-* (post-date), *pro-* (pro-British), *semi-* (semi-automatic), *sub-* (subclassify, subterranean), *un-* (untie, unburden)

Stage 4

-able, -ee, -ic, -ify, -ion, -ist, -ition, -ive, -th, -y, pre-, re-

Stage 5

-ar (circular), *-ate* (compassionate, captivate, electorate), *-et* (packet, casket), *-some* (troublesome), *-ure* (departure, exposure), *ab-, ad-, com-, de-, dis-, ex-* ('out'), *in-* ('in'), *ob-, per-, pro-* ('in front of'), *trans-*

Harwood and Wright (1956) who all analysed the Thorndike lists. Teachers may wish to be selective at the later stages of the table as the items are a mixture of high-frequency irregular items and low-frequency items. Thorndike (1941: 59), for example, recommends that the best way to learn what *-some* means is to learn the meanings of twenty or more words made with it. Similarly with *-ure*, Thorndike recommends that learners simply spend five minutes looking at a list of words ending in *-ure*.

There is no evidence to show that the stages in this list represent the order in which learners acquire a knowledge of affixes. There is also no reason to expect that there is an invariant order in which they are acquired. The list however indicates an order for teaching and learning that will give the best return for learning effort.

Do language users see words as being made of parts?

There has been continuing experimentation on whether native speakers of English and other languages treat words which contain prefixes and suffixes as set units or whether they reconstruct these complex words each time they use them by adding affixes to the stem. That is, do we store and retrieve *government* as a single form, or do we make it out of *govern* plus *-ment* each time we use it? This question is not a simple one because there are many variables that can influence the way language users store and retrieve words, and many ways words can be stored. Marslen-Wilson, Tyler, Waksler and Older (1994) list the important variables which include: the particular language involved, whether spoken or written use is investigated, whether prefixes or suffixes are being considered, whether inflectional or derivational affixes are considered, whether the affix and stem combinations are semantically transparent (the meaning of the whole equals the sum of the parts) and whether the forms of the parts are easily recognisable in their spoken or written forms.

There are several kinds of evidence that indicate that at least for lower-frequency, regularly formed, semantically transparent suffixed words, and possibly for some other kinds of complex words, they are recomposed each time they are used. Nagy, Anderson, Schommer, Scott and Stallman (1989) investigated whether the speed with which a word is recognised depends on the frequency of the word form alone or whether it depends on the combined frequency of the members of the word family. For example, does the speed at which a learner recognises the word *argue* depend only on the frequency of *argue* or does it depend on the combined frequency of *argue*, *argues*, *arguing*, *argument*, etc.? If the speed of recognition depends on the combined frequency of members of the word family, then this is evidence that morphological relations between words are represented in the lexicon. To make sure that it really was morphological relationships and not simply similar spelling, Nagy *et al.* also checked to see if the recognition of a word like *fee* was influenced by the frequency of words like *feet*, *feel*, *feed* which share the same letters but which are not morphologically related. Nagy *et al.* found that both inflected and derivational relationships significantly affected speed of recognition, suggesting that inflected and derived forms are stored under the same entry or are linked to each other in the mental lexicon. This underlines the importance of making learners aware of morphological relationships and of considering words to be members of word families when teaching or testing.

Several researchers point out that there are differences between what etymological, linguistic and synchronic analysis reveal as being

word parts, and what language users actually operate with as they construct complex words. A young native speaker of English, who is half-Thai and half-Caucasian, at the age of five told me he was 'half-Buddhess, half-Goddess'. Most native speakers do not realise that the words *rank* and *arrange* are etymologically related. Although *business* is regularly related to *busy*, *organisation* to *organ*, few native speakers would realise the connection.

Interpretation of interview data on vocabulary knowledge in Anglin (1993) suggests that derivational affixes may be implicitly learned. In their descriptions of derived words, six-, eight- and ten-year-old children rarely explicitly described derived words in terms of their root and affix. 'Children more often figure out an inflected or derived word by isolating its corresponding root word, identifying its meaning, and then casting the whole inflected or derived word appropriately into an illustrative sentence' (Anglin, *ibid.*: 145).

In this typical example from Anglin (*ibid.*: 96), I is the interviewer and C is the child.

I. The next word is *unbriable*. What does the word *unbriable* mean?

C. Um . . . people try to bribe you and sometimes like they try to . . . say somebody had like \$2,500.00 maybe and someone . . . say their friend who never cared for them or something . . . they would give you flowers and chocolates and they would say, 'I want to be your friend,' and all that, but they're just trying to bribe you. But *unbriable*, they won't do it, they just, you won't fall for it anymore. Like you won't get bribed; you'll be unbriable. You'll say no.

I. OK. Can you tell me anything more about the word *unbriable*?

C. Like I'm probably unbriable because I don't let anybody bribe me or anything to take my toys and money or something away. So I wouldn't let them do it to me. I'd just say like, 'I can't. I'm unbriable.'

There is also plenty of evidence (Nagy, Diakidoy and Anderson, 1993) that native speakers' use and awareness of morphological relationships develops from the very early stages of language use to at least their teenage years. Table 8.5 lists the language factors that affect the likelihood of learners noticing and using word parts.

Let us look at two examples to make Table 8.5 clearer.

1. *-ness* as in *slowness* is an affix that meets many of the criteria in Table 8.5.

- It appears in many words (*happiness, sadness, tenseness*); there are 307 different word types with this affix in the *LOB Corpus*.
- It has a high frequency; some of the word types containing *-ness* are very frequent.

Table 8.5. *Factors affecting the ease of perceiving and using word parts (technical terms given in brackets)*

USE	The affix appears in many words.	(frequency)
	The affix appears in frequent words.	
	The affix continues to be used to form new words.	(productivity)
	The affixed word is the same form class as the base.	
	The affix attaches to a base of known form class and produces a word of known form class.	(regularity of function)
MEANING	The meanings of the stem and affix are closely related to the meaning of the complex word.	(semantic transparency)
	The affix has only one meaning or one very common meaning.	(predictability)
	The affix has both a semantic and grammatical meaning.	
FORM	The base is a complete word in its own right.	(a free form)
	This combination of letters only occurs as an affix.	
	The spoken form of the base does not change when the affix is added.	(regularity of the spoken base)
	The spoken form of the affix does not change when the affix is added.	(regularity of the spoken affix)
	The written form of the base does not change when the affix is added.	(regularity of the written base)
	The written form of the affix does not change when the affix is added.	(regularity of the written affix)

Note: Neutral affixes have a high degree of regularity. Non-neutral affixes are less regular.

- *-ness* is still used to make new words, such as *deadness*. It is very productive.
- It is generally but not always added to adjectives to make nouns. It has a high but not perfect regularity of function.
- Words made with *-ness* are semantically transparent. Thorndike (1941) says that ‘the quality, state, or condition of being x’ accounts for about 95% of its uses and ‘x behaviour’, as in *brusqueness* and *kindness*, accounts for the rest. It has high predictability. Exceptions are *witness*, *business* and (*Your*) *Highness*.
- *-ness* does not add more than its syntactic meaning. *-ful* as in *cupful* or *un-* as in *unhappy*, on the other hand, add a clear semantic meaning.
- *-ness* is only added to free forms. If we take *-ness* away, the remaining base is always a word in its own right.
- The word *lioness* has a final *ness* which is not the affix *-ness*. This instance is unlikely to cause confusion.

- *-ness* is very regular in both spoken and written forms and with reference to both affix and base. The spelling rule ‘y becomes i’ as in *happy – happiness* applies. It is a neutral suffix.
2. In contrast to *-ness*, the suffix *-ee* as in *appointee* and *payee* has less systematic patterning. The *LOB Corpus* has 25 examples. None are of high frequency.
- It is occasionally used to form new words, so is still productive.
 - *-ee* makes nouns usually from a verb base.
 - *-ee* has several meanings and the most regular pattern ‘one who is x-ed’ as in *payee* only accounts for a small number of its uses. Unpredictable examples include *bargee*, *absentee*, *goatee*, *bootee*, *committee*, etc.

Word stems

The stems of complex words may be bound or free forms. Free forms can occur as words with no affixes. Bound forms can only occur with a prefix or a suffix. Advanced learners of English can usefully study small numbers of bound stems. One way of checking whether these stems are worth learning is to try to make substitution tables around them. If the stem can combine with many affixes to make a large number of words, it deserves attention. Here are some examples. In the table for *port* (see Table 8.6), we can make the following words, *export*, *exportable*, *exporter*, *exportation*, and so on. Other useful stems include: *fer* (*refer*, *prefer*), *form* (*deform*, *reform*), *ject* (*reject*, *injection*), *pos* (*oppose*, *propose*), *plic* (*complicated*, *applicable*), *scrib* (*scribble*, *subscribe*), *spect* (*inspect*, *spectacles*), *sta* (*circumstance*, *constant*) and *tract* (*tractor*, *subtract*).

If learners have special purposes for learning English, it is worth investigating to see if there are affixes and stems which are important in their areas of specialisation. Students of medicine, botany and zoology, for example, will find that there are affixes and stems like *-itis*, *haemo-* and *photo-* that can give them access to many technical words in their fields.

The knowledge required to use word parts

To make use of word parts learners need to know several things. For receptive use, they have to be able to recognise that a complex word, such as *unhappiness*, is made up of parts, and that these parts can

Table 8.6. *Word stems and affixes*

1. <i>-port</i> – (to carry)		
ex-		[0]
im-		-able
trans-		-er
		-ation
<hr/>		
[0]		[0]
re-	<i>port</i>	-able
sup-		-er
<hr/>		
de-		[0]
		-ation
<hr/>		
sup-		-ive
[Other useful words with <i>port</i> : important, insupportable]		
2. <i>-struct</i> – (to build)		
con-		[0]
de-		-ion
in-		-ive
ob-		
	<i>struct</i>	<hr/>
[0]		
re-		-ure
3. <i>-vers</i> – (to turn)		
a-		
ad-		
con-		
ob-		-e
per-		
re-		
<hr/>		
a-		
con-	<i>vers</i>	-ive
sub-		-ion
<hr/>		
di-		
extra-		
in-		-ion
intro-		
per-		
retro-		

occur in other words, such as *unpleasant*, *happily* and *sadness*. Tyler and Nagy (1989) call this 'relational knowledge'. Learners also need to know what the parts mean. In addition, they have to be able to see how the meanings of the stem and affix combine to make a new but related meaning. In the case of most suffixes this is largely syntactic, but particularly with prefixes, the affix can contribute significantly to the meaning of the complex word. An important extension of this to help learning is for the learners to be able to see how the meaning of the parts relates to the dictionary meaning of a new word. This then allows the parts to act as mnemonic devices for the meaning.

For productive use, the learner needs a more detailed awareness of the formal changes to the stem and the affix that can occur when they are combined to form a complex word. These formal changes can affect the pronunciation: *flirt/flirtation* (stress change), *quantity/quantify*, *describe/description*. They may also affect the written form: *sacrilege/sacrilegious*, *legal/illegal*. Some changes in the written form are covered by regular spelling rules. Also for productive use the learner needs to be aware which form class of stem can take certain affixes. For example, *-ly* can be added to adjectives but not to nouns. Tyler and Nagy call this 'distributional knowledge'.

Before looking at activities to develop each of these kinds of knowledge, it is worth considering some general principles. Firstly, it is probably most efficient to begin to deal with word parts after learners have already learned a substantial number of complex words as unanalysed wholes. These can act as familiar items to attach their new knowledge of word parts to. Secondly, it is important to see the development of knowledge of word parts as being a long-term process. Basing it on a 'mini-syllabus' such as the levels described by Bauer and Nation (1993) is a useful way of systematically sequencing the teaching. Thirdly, like all vocabulary learning, there is the danger of interference between items if formally or functionally similar items are focused on at the same time. It is probably wise to deal with one affix at a time as the opportunity arises, rather than having intensive word building sessions where a range of new affixes is introduced. Fourthly, the use of word parts in understanding and producing words is essentially a creative activity. Anglin (1993) and others call it 'morphological problem solving'. Learners should therefore be encouraged to see the regular form and meaning patterns that lie behind the use of many word parts, and to take risks. Fifthly, there are large numbers of stems and affixes but some are much more useful than others. When giving attention to stems and affixes some thought should be given to their frequency, so that the learning and teaching effort is well repaid by many opportunities for use. Finally,

it needs to be realised that many complex words are not based on regular, frequent patterns and are best learned as unanalysed wholes. Part of the learners' and teacher's skill is being able to recognise when this is the case.

Monitoring and testing word building skills

There are four aspects of word building knowledge that are worth monitoring by a teacher. Monitoring can be done in a rather informal way through classroom tests, sometimes with the learners contributing items, or it can be done more formally through carefully designed tests that will be used with different classes and by different teachers. The four aspects are listed in order of importance with each accompanied by some testing procedures.

Learners need to be able to recognise word parts in words

1. Learners are given words that they break up:

unhappiness *un/happi/ness*

Learners' knowledge of the meaning of the parts can also be tested by asking them to label the affixes.

not ← *un/happi/ness* → noun

This test is simple to make, a little time-consuming to mark, and requires the learners to have explicit knowledge of the tested items. It is a good classroom test.

2. Learners group words according to their parts. Carroll (1940) developed the following item type for formal testing of learners' skill in recognising parts and identifying their meaning. Carroll's test contained 36 items like the following:

- | | |
|--|---|
| <input type="checkbox"/> 1. ready | <input type="checkbox"/> 1. writing |
| <input type="checkbox"/> 2. read | |
| <input type="checkbox"/> 3. regression | <input type="checkbox"/> 2. back, again |
| <input type="checkbox"/> 4. region | |
| <input type="checkbox"/> 5. repeat | <input type="checkbox"/> 3. true |
| <input type="checkbox"/> 6. return | |
| <input type="checkbox"/> 7. rectangle | <input type="checkbox"/> 4. very |

The instructions are as follows:

In the LEFT-HAND column of each problem there are several words which have some common element of meaning. This common element of meaning is represented by groups of letters in the words. But the group of letters which is found in each word *does not have the same meaning in all*

of them. You are to find all the words in which the group of letters has the same meaning. Place a cross (✕) in the box to the left of all the words which have that common element of meaning. In the RIGHT-HAND column of the problems are four words or phrases, *only one* of which is the English equivalent or meaning of the language unit common to the words you have just marked. Place a cross in the box to the left of the correct word or phrase. (*ibid.*: 104–105)

Carroll found correlations higher than .9 between the learners' scores on choosing the correct examples in the left hand column and choosing the right meaning in the right hand columns of the items.

Learners need to be able to recognise what the affixes mean and do

There are two approaches to testing this: one which requires explicit knowledge and one which does not.

1. The learners are given a list of word parts and have to write their meaning or function. For example:

-ness _____
 -less _____
 re- _____

These parts could be presented in words:

happiness _____
 careless _____
 reconsider _____

To make the test a little easier and to make marking easier, choices could be provided:

Copy the appropriate meaning from the answers next to each word.

Answers: again, makes a noun, down, without, makes a verb
 happiness _____
 careless _____
 reconsider _____

2. Tyler and Nagy (1989) devised the following item type to avoid the need for explicit knowledge:

You can _____ the effect by turning off the lights.
 (intensify, intensification, intensity, intensive)

To avoid the effect of previous knowledge of the whole word forms, in one version they used nonsense stems.

I wish Dr Who would just _____ and get it over with.
 (transumption, transumptive, transumpate, transumptatic)

In a later study Nagy, Diakidoy and Anderson (1993) developed another item type to avoid the weaknesses they saw in the previous items (that is, the possibility of knowing the whole unanalysed form *intensify*, and the distracting effect of nonsense words ('How can I choose if I don't know what the word means?').

Which sentence uses the word powderise correctly?

- a. First they had to find a powderise rock.
- b. First they had to powderise find the rock.
- c. First they had to find a powderise for the rock.
- d. First they had to find a way to powderise the rock.

Teachers may feel that this item type is undesirable for normal classroom use because of the effort required to prepare such items and the predominance of incorrect examples over correct ones. For Nagy *et al.*'s (1993) controlled experimental study however, it worked well.

Learners need to be aware of the changes of written and spoken form that occur when an affix is added to a word

1. The simplest way to test the written form is to give spelling dictation. That is, the teacher says words like *unhappiness* and the learners write them.
2. The teacher gives the learners a list of stems + affixes which the learners must combine:
happy + ness = _____
3. For some learners, the explicit testing of a spelling rule may be useful, for example: 'What happens when you add a suffix beginning with a vowel to a word ending in y?' 'Change the y to i and add the suffix.'

Learners need to know which classes of stems can take certain affixes

Tyler and Nagy (1989) tested this aspect of productive word building knowledge by giving learners a list of items consisting of well formed and ill formed items that the learners had to respond to by indicating 'Yes' or 'No'. All the stems were known items.

tameness	_____
repeatise	_____
harshful	_____
flattish	_____
centreless	_____

In the above examples *repeatise* and *harshful* should be responded to with 'No' because *-ise* is not added to verbs, and *-ful* is not added to adjectives.

If Corson's (1985) idea of the lexical bar is correct, learners may be reluctant to use derived forms wherever a simpler form is available. This avoidance could be picked up by researchers by counting the number of derived forms in learners' speech or writing and comparing that with equivalent native speaker use. This is an unresearched area.

The word part strategy

The word part strategy for learning new complex words involves two steps:

1. Break the unknown word into parts. This step requires learners to be able to recognise prefixes and suffixes when they occur in words.
2. Relate the meaning of the word parts to the meaning of the word. This step requires learners to know the meanings of the common word parts. It also requires learners to be able to re-express the dictionary definition of a word to include the meaning of its prefix and, if possible, its stem and suffix.

Here are some examples. The italicised words represent the meaning of the affix. Note how the dictionary definition does not usually give the meaning of the affixes.

Word	Dictionary definition	Reworded definition
unaccountable	does not seem to have any sensible explanation	<i>not able</i> to be explained
reshuffle	reorganisation of people or things, esp. jobs	change people or jobs <i>again</i>
community	people who live in a particular place or area	people who live <i>together</i> in a place
disperse	scatter	go <i>away</i> in many different directions
exhaust	drain the energy	make the energy go <i>out</i>
incessant	continual	<i>not</i> stopping

There are several ways of learning the meanings of prefixes and suffixes and becoming familiar with their forms. Basically, however, learners should deliberately learn the meanings of the most common affixes. The learning procedure can be the same as the deliberate learning of

Table 8.7. *A list of prefixes for a pair learning activity*

Prefix	Meaning	Example word
<i>fore-</i>	before	forename
<i>bi-</i>	two	biplane
<i>en-</i>	forms a verb	engage, enslave
<i>ex-</i>	former	ex-president
<i>mis-</i>	wrongly	misfit
<i>pro-</i>	in favour of	pro-British
<i>semi-</i>	half	semi-automatic
<i>counter-</i>	against	counter-attack
<i>hyper-</i>	above, over	hyperactive
<i>inter-</i>	between, among	inter-African, interweave
<i>arch-</i>	chief	archbishop
<i>mid-</i>	middle	mid-week
<i>neo-</i>	new	neo-colonialism
<i>post-</i>	later, after	post-date
<i>anti-</i>	against	anti-inflation
<i>un-</i>	reversal of action	untie, unburden
<i>sub-</i>	under	subclassify, subterranean

words using word cards as described later in this chapter. The list given in Table 8.5 provides a useful set of learning goals. Time should be provided in class to make sure they are learned and simple tests should be given to monitor and encourage learning.

After some affixes have been learned, there are various game-like activities that can be used to help establish the knowledge. These include ‘word-making and word-taking’ (Fountain, 1979), Bingo-type games (Bernbrock, 1980) and analysis activities (Nation, 1994: 182–190). Word-making and word-taking involves learners using cards with affixes and stems on them and trying to put them together to make words. Analysis activities involve learners in breaking words into parts, grouping words with similar parts and matching parts and meanings.

Learners can also teach each other prefixes and suffixes in pair work. One learner is the teacher and has a list of words with their prefixes and meanings of the prefixes listed. Table 8.7 is based on level 5 of Bauer and Nation (1993).

The learner folds his paper so he can only see the list of meanings. The ‘teacher’ says a word, says its prefix and then waits for the learner to find the meaning. The ‘teacher’ gives the learner three chances at finding the meaning in his list and then gives the answer. The ‘teacher’

then moves on to the next word. However, just before a new word on the list is presented all the previous ones are tested again. This revision is more important than the initial testing.

Teachers should model the analysis of words and re-expressing word meanings as much as possible. This strategy of re-expressing word meanings is essentially an application of the keyword technique. The affixes or stem act as the keywords and the re-expressing of the meaning represents the combined imaging of the meaning of the keyword and the meaning of the target word.

The justification for spending time helping learners gain control of the word part strategy is that it can help the learning of thousands of English words. The strategy is useful for both high-frequency and low-frequency words, and is especially useful for academic vocabulary.

It takes time to learn the important prefixes and suffixes and to learn to re-express meanings. A well developed vocabulary development programme makes sure that this time is planned and provided.

Some writers (Ilson, 1983; Pierson, 1989) suggest that learners should get information about the derivations of words; what languages they came from to English, and the form and meaning changes that occurred to them when they were adopted as English words. Pierson notes that this information is especially meaningful to Chinese learners as they are aware of the etymology of Chinese written characters and appreciate seeing a similar process of change in English words. An interest in etymology requires learners to have access to a dictionary that provides this information. Unfortunately, learners' dictionaries do not provide simple versions of etymological information. Ilson (1983) suggests that there are four kinds of etymological information: listing origins and cognates, breaking words into their parts, describing the processes by which particular words are formed (*brunch* = *breakfast* + *lunch*) and explaining the procedures in the development of particular words. The value of etymology for learners of English is that it is an interesting subject in its own right but, more importantly, it can help make some words more memorable. That is, it can help learning.

The study of cognates and loan words may be useful for some learners, especially where there are significant changes to the form of words after they have been borrowed. Daulton (1998) notes that although Japanese contains a large number of English loan words, the move to a syllabic spelling system has brought about striking formal changes. This means that there is a need for the deliberate pointing out of relationships.

The word building systems of English are very important ways of enabling learners to make the most effective use of the stem forms that

they know. It is thus important to check that learners have the knowledge to use these systems and that (where appropriate) they are making use of that knowledge.

We have looked at the importance of prefixes, bases and suffixes for the learning of vocabulary. Using the information we have looked at so far, teachers should be able to: (1) decide which affixes their learners should know, (2) test to see if their learners know them and (3) design a range of activities to help them learn the affixes. Teachers should also be aware of the range of factors which cause difficulty in recognising and using word parts.

Using word parts to help remember new words is a major vocabulary learning strategy. It deserves time and repeated attention because it can involve such a large proportion of English vocabulary. Another important strategy, especially for accessing the meaning of words, is dictionary use, which we will look at now.

Using dictionaries

Dictionaries can be used for a wide range of purposes. Scholfield (1982a, 1997) has consistently distinguished between the different requirements and strategies for dictionaries which are to be used for comprehension (listening and reading) and dictionaries which are to be used for production (speaking and writing). As well as being sources of information, dictionaries can also be aids to learning (Nation, 1989). The following list covers most purposes for dictionary use.

Comprehension (decoding)

- Look up unknown words met while listening, reading or translating.
- Confirm the meanings of partly known words.
- Confirm guesses from context.

Production (encoding)

- Look up unknown words needed to speak, write or translate.
- Look up the spelling, pronunciation, meaning, grammar, constraints on use, collocations, inflections and derived forms of partly known words needed to speak, write or translate.
- Confirm the spelling, pronunciation, meaning, etc. of known words.

- Check that a word exists.
- Find a different word to use instead of a known one.
- Correct an error.

Learning

- Choose unknown words to learn.
- Enrich knowledge of partly known words, including etymology.

In the following sections we will look at these various purposes in more detail.

Is it necessary or worth training learners to use dictionaries?

This section looks at whether learners use dictionaries well, and looks at the value of being able to use a dictionary.

Do learners use dictionaries well?

Studies of second language learners' dictionary use have involved questionnaires (Béjoint, 1981; Tomaszczyk, 1979), analysis of filmed recordings (Ard, 1982), observing dictionary use (Atkins and Varantola, 1997), and filling out flow charts immediately after dictionary use (Harvey and Yuill, 1997).

Harvey and Yuill looked at learners' use of a monolingual dictionary (*Collins COBUILD English Language Dictionary*) while writing. Because a monolingual dictionary alone was used, this study was largely restricted to learners looking up words that they already partly knew, or that they thought might exist in a similar form to their first language. 10.6% of the look-ups however were to find a synonym to replace a known second language word.

Table 8.8 lists the reasons for looking up words and gives the percentage of successful searches.

A notable finding of the study was the number of times that the example sentences were used to get information on meaning, grammar and register. The study also indicated that learners made little use of the grammatical coding scheme in the dictionary. Béjoint (1981) found that learners said that they did not give much attention to the various coding schemes. Generally, for these learners the degree of success in their dictionary use was quite high.

The Atkins and Varantola (1997) study examined users (who were largely very advanced and lexicographically sophisticated users of English) performing a translation task. They had access to both

Table 8.8. *Reasons for and degree of success in looking up words in COBUILD during a writing activity (based on Harvey and Yuill, 1997)*

Reason for searching for the word	% of total look-ups	% success of the search
to check on spelling	24.4%	92.8%
to confirm the meaning	18.3%	87.1%
to see if the word exists	12.8%	77.0%
to find a synonym to use instead of the known word	10.6%	63.9%
to find out about the grammar of the word	10.5%	90.2%
to check on the constraints or register of the word	9.3%	92.1%
to find collocations	8.2%	78.6%
to find a correctly inflected form	5.9%	100.0%

bilingual and monolingual dictionaries. The vast majority of look-ups were to find or check on an L2 translation. Success rates were higher with bilingual dictionaries, and in L2–L1 translation.

Most studies of learners' dictionary use have involved advanced and sophisticated learners; this is partly because a reasonable level of proficiency is needed to use a monolingual dictionary. There is a noted lack of studies on less proficient learners and on the effects of training on dictionary use.

Do dictionaries help learners?

Dictionaries can help learners with understanding and producing text, and with vocabulary learning. Luppescu and Day (1993) looked at the effect of bilingual dictionary use on vocabulary learning while reading. Students using a dictionary gained higher scores on a vocabulary test given immediately after the reading than students who did not use a dictionary. However, some items in the vocabulary test were answered incorrectly by more learners who used a dictionary than those who did not. This seemed to occur for words where there were many alternative meanings given in the dictionaries. This suggests that learners' dictionary searches were not very skilful. It was also noted that learners who used a dictionary took almost twice as long to read the passage as learners who did not use a dictionary.

Some studies of dictionary use have used texts and dictionaries on the computer. This means that each look-up can be electronically recorded (Knight, 1994; Hulstijn, 1993). In a carefully designed

experiment with learners of Spanish as a second language, Knight (1994) found that learners who had access to a dictionary learned more words in both immediate and delayed (two weeks later) tests than learners who had no access to a dictionary. Learners with access to the dictionary also gained higher comprehension scores. Access to the dictionary helped the lower verbal ability group most. Their scores with dictionary access were close to the high verbal ability group who also had dictionary access. Without dictionary access, relying only on guessing from context, the difference between the high and low verbal ability groups was greater. The dictionary use groups took longer to do the reading. A study of the amount of dictionary use suggested that high ability learners may have been using the dictionary when they did not need to. Hulstijn (1993) made a similar finding.

Knight (1994) suggests that Bensoussan, Sim and Weiss's (1984) finding that dictionary use had no effect on comprehension may have occurred because the learners in the Bensoussan *et al.* study were all high proficiency learners. Knight found no difference in comprehension scores with or without dictionaries for her high verbal ability group.

Hulstijn (1993) found a very wide range of amount of dictionary consultation between individuals. Learners were generally strategic with the words they looked up, giving most attention to those words that were most relevant to the reading comprehension task that they were set, and ignoring words which were not relevant to the task. Words that could be easily inferred were looked up almost as much as words that were difficult to infer. Learners do not seem to have great faith in their inferring skills.

Generally dictionary use takes time and some learners may spend more time on dictionary use than they need to. This may be a result of the tasks that were used in the experiments and learners' awareness that they were involved in an experiment. Dictionary use helps learning and comprehension, and is particularly useful for learners who do not cope well with guessing from context.

What skills are needed to use a dictionary?

Several researchers (Neubach and Cohen, 1988; Scholfield, 1982b) have noted the complex nature of dictionary use. The skills required differ according to whether the dictionary is used in conjunction with listening and reading (receptive use), or with speaking and writing (productive use). In the following sections these skills are described as steps in strategies for receptive and productive use. See Scholfield (1982b) for a detailed description of a similar strategy.

Receptive use

Receptive use of a dictionary largely involves looking up the meaning of a word that has been met while reading or listening. The following steps make up a strategy that can be the basis for learner training. As each step is described, the skills needed at each step are spelled out, tests of these skills are suggested, and suggestions for training learners in the skills are provided.

1. *Get information from the context where the word occurred.* The skills needed for this step include: (1) deciding on the part of speech of the word to be looked up, (2) deciding if the word is an inflected or derived form that can be reduced to a base form, (3) guessing the general meaning of the word and (4) deciding if the word is worth looking up by considering its relevance to the task and general usefulness.

Each of these skills can each be tested directly. Training in finding the part of speech can be done by intuitively classifying words in context into part of speech, or by following some rules that guide the classification. To gain skill in breaking words into parts learners can just practise doing so with feedback and guidance, or they can learn the commonest affixes. Clarke and Nation (1980) suggest a way of training learners in guessing from context (see also chapter 7).

2. *Find the dictionary entry.* Skills needed for this include: (1) knowing the order of the letters of the alphabet (some dictionaries do not follow a strictly alphabetic order), (2) knowing the dictionary symbols for the different parts of speech and (3) knowing alternative places to search, such as separate entries, sub-entries, word groups, derived forms, variant spellings and appendixes.

Each of these skills can be tested separately by getting learners to say the alphabet, interpret dictionary symbols and describe different places to search. The combined skills can be tested by doing timed searches. Learners can be prepared for this step by practising saying the alphabet, studying and being taught about the various symbols used in the dictionary with some practice in using them, observing skilled dictionary users searching for a word, and analysing dictionary entries and classifying their parts. The following is a useful split information activity which can be used for gaining familiarity with the types of information that may be found in a dictionary entry.

Each learner has one of the following sentences to memorise. After memorising, each learner returns the piece of paper containing the sentence to the teacher. Then, without any writing, the learners put the sentences in order so that the description of a typical dictionary entry is correct. Here are the sentences.

- a. The phonetic variations can then be shown. For example /klever/.
- b. Next, the entry gives the part of speech of the word. For example, noun, verb, adjective.
- c. The meaning of the word is the next part of the dictionary entry.
- d. Frequently the entry shows how the word is used in a sentence.
This is to help you use the word more easily.
- e. The entry for each word has its parts arranged in a certain order.
- f. Then the entry can show variant spellings of the word, e.g. colour/color.
- g. Then the entry can have the information as to whether or not the word, if it is a noun is countable or uncountable.
- h. This may be accompanied by the year or century in which the word was first used in English.
- i. The dictionary entry can have the derivation (what language the word comes from). For example *sabib* IndE and EPak.
- j. The phonetic guide to the pronunciation of the word follows. For example /klevə/.
- k. The actual spelling of the word is first in the entry.

3. *Choose the right sub-entry.* Once the correct entry has been found there may be a need to choose between different meanings and uses listed within that entry. In order to make this choice, the information gained in step 1 from the context in which the word occurred will need to be used. This may involve quick scanning of all or most of the sub-entries to make sure that the most appropriate sub-entry is chosen. There are useful tests of this skill which can also be used for practice. In a text, the teacher chooses words that have several different meanings or related meanings. For example, the context may say 'He was scrubbing the *flags* in front of his house.' The learner then has to find the most suitable entry, which in this case is where *flags* stands for *flagstones*. Learners can get guided practice in choosing between sub-entries through group discussion and systematic elimination of the inappropriate sub-entries. When they guess such words in context, learners can predict whether it is likely to be a common meaning or an uncommon meaning, because this will give some indication of how far in an entry they may need to search.

4. *Relate the meaning to the context and decide if it fits.* This step involves adapting the meaning found in the dictionary to the context of the word in the text. In many cases this will not be a big change. In a few cases some narrowing or stretching of the meaning may be necessary. Another skill at this step is evaluating the success of the search, that is, does the meaning found fit nicely with the message of the text? There are two ways of testing whether learners have completed this

step well. One is to measure comprehension of the text with a focus on the parts containing the unknown words. Another is to get learners to do self-evaluation of their search. Training in this step can involve making use of definitions and the example sentences in the dictionary to interpret words in context. Training can also involve paraphrasing the original contexts with the meaning of the unknown words added.

These steps may seem complicated, but in practice learners should be able to follow them quite successfully. But before getting too far into a strategy training programme, it is important to check that learners do need practice and training, and to check what aspects of the strategy need attention. A technique used by some learners is to mark each entry they look up in the dictionary each time they do so. They will realise they have looked up the same item more than once and this can provide an incentive for deliberate learning of the item.

Productive use

Using a dictionary for productive use is sometimes called using a dictionary for encoding, that is, turning ideas into language. It involves finding word forms to express messages. Bilingual dictionaries which go from the first language to the second language are an efficient way of doing this. Some writers suggest using a combination of bilingual and monolingual dictionaries for this purpose in order to get the best value from both types (Scholfield, 1982a; Stein, 1988).

It is possible to devise a strategy for using a dictionary for productive use. Scholfield (1981) describes a similar strategy for the correction of errors in written work.

1. *Find the wanted word form.* The skills needed to do this include: bilingual dictionary use; using a dictionary like the *Longman Language Activator*; or using synonyms, opposites or related words in a monolingual dictionary. Using a monolingual dictionary requires considerable search skills and requires a reasonable proficiency level in the second language. The following steps assume that if the word is looked up in a bilingual dictionary, there may also be a need to look it up in a monolingual dictionary to gain more detailed information so as to allow productive use of the word.

2. *Check that there are no unwanted constraints on the use of the word.* This step involves the skills of interpreting the dictionary's style labels and codes. These labels include: indications of whether the word is in current use or archaic, whether it is formal or colloquial, whether it is only used in the US or UK, whether it is impolite, etc. Several writers have indicated the inconsistency with which dictionaries signal this information (Hartmann, 1981). Teachers can train

learners in the interpretation of these labels through explanation and practice.

3. *Work out the grammar and collocations of the word.* Some of this information can come from the example sentences in the dictionary. Research indicates that learners are more likely to make use of the example sentences than they are to try to interpret grammatical coding schemes. This indicates that practice and training would be of great value in this particular skill of dictionary use. Generally, the more detailed information given by a coding scheme, the more difficult it is to interpret. However, this grammatical information can be of great use in written and spoken production. Not only is it necessary to be able to interpret the codes (e.g. N COUNT), it is necessary to be able to apply this information. (N COUNT means that a noun can be plural, and a singular form must have *a*, *the*, or a similar word in front of it.)

4. *Check the spelling or pronunciation of the word before using it.* In most learners' dictionaries the working out of the pronunciation requires reading phonetic script. This is a skill requiring considerable practice.

The two dictionary use strategies just described comprise one of the four major options for learners to deal with unknown vocabulary. They are an essential complement to the other options: inferring from context, using word cards and using word parts. Because dictionary use provides access to so many words and to so much information about them, it deserves a considerable amount of classroom time. Teachers should be willing to spend up to an hour a week over several weeks checking that learners have control of these strategies and training learners in their use.

To put the dictionary use strategies into practice, it is necessary to have access to a good dictionary. The next section looks at what dictionary types are available and how teachers and learners can judge which ones they should own.

What dictionaries are the best?

There are three major kinds of learners' dictionaries in terms of the languages they use: monolingual, bilingual, and bilingualised. Monolingual dictionaries are written all in one language; an English monolingual dictionary has an English headword, an English definition, and all the examples and other information in English. Second language learners using a monolingual dictionary need to be able to interpret definitions and other information in the second language. Here is an example entry from the *Longman Dictionary of*

Contemporary English. W2 indicates that the word is in the second thousand most frequent words in written English.

in.creas.ing.ly /in_kri:siŋli/ *adv* more and more all the time W2
 [+adj/adv]: *The classes at the college have become increasingly full over the past five years.* [sentence adverb]: *Increasingly, it is the industrial power of Japan and South East Asia that dominates world markets.*

In some monolingual dictionaries for learners of English the definitions are written within a controlled vocabulary of around two thousand words. Other learner dictionaries have a policy of making the definitions simple but not being limited by a fixed defining vocabulary. Learners seem to prefer dictionaries written in a controlled vocabulary (MacFarquhar and Richards, 1983).

Cumming, Cropp and Sussex (1994) compared the effect of phrasal definitions, sentence definitions, phrasal definitions with an example sentence, and sentence definitions with an example sentence. No difference was found on a production measure (write a sentence using the word) and a 'comprehension' measure (which of six sentences using the word are correct). Students indicated a clear preference for having examples with definitions and they favoured the sentence definition format.

In general, monolingual learners' dictionaries contain much more information about each word than bilingual dictionaries do, and some teachers recommend that bilingual dictionaries be used in conjunction with monolingual dictionaries for writing and speaking.

Bilingual dictionaries use two languages. The head word and the examples are in one language and the meaning is in another. Sometimes the example sentences are also provided in two languages. So, a bilingual dictionary for a French learner of English would have the head word in English, a French translation of the word to provide the meaning and example sentences in English with perhaps a French translation of those sentences. Another section of the dictionary might go the other way (for speaking or writing), with the head word in French and then English words that could be used to convey that meaning. Here is an example entry from *Collins German Dictionary* (Terrell, Schnorr, Morris and Breitsprecher, 1991).

Nachprägen *vt sep (nachträglich prägen)* to mint or strike some more; (*fälschen*) to forge. **es wurden 200 Stück nachgeprägt** a further 200 copies were struck.

Bilingual dictionaries are often criticised. It is said that they encourage the use of translation (thought to be counter-productive in the language classroom), that they encourage the idea that words in the

second language are equivalent in meaning to words in the first language (a one-to-one relationship) and that they provide little information on how words are used. These criticisms are misguided and unfair, and they also ignore the advantages of bilingual dictionaries (Thompson, 1987); a more balanced view needs to be taken of the role of translation in the language classroom. As a way of communicating meaning, the first language has several advantages. However, there needs to be care that there are a lot of chances for second language use, and second language use at a fluent level. As Nation (1978b) points out, translation as a way of communicating meaning is in general no better or worse than other ways. It would be just as misleading for a second language learner to believe that words in a second language are equivalent in meaning to their dictionary definitions as to believe that they are equivalent to their first language translation. While many bilingual dictionaries contain little information about each word, they can be seen as a complement, rather than a competitor, to monolingual dictionaries. Moreover, some bilingual dictionaries provide substantial information about each word.

The major advantages of bilingual dictionaries are: (1) they provide meanings in a very accessible way, and (2) they can be bi-directional – English–first language and first language–English. Although most monolingual dictionaries use a controlled vocabulary in their definitions, a learner has to know this vocabulary and has to be able to cope with the grammatical difficulties of the explanation. Numerous research studies (Lado, Baldwin and Lobo, 1967; Laufer and Shmueli, 1997) have shown that vocabulary learning is much more effective using L2–L1 pairs than through L2–L2 definition pairs. There is also plenty of evidence that shows the difficulties native speakers (McKeown, 1993) and non-native speakers (Nesi and Meara, 1994) have in understanding definitions.

Dictionaries can be used for both receptive and productive use. Bilingual dictionaries which go from the first language to the second language provide easy access to vocabulary for productive use. This access is not easily provided in monolingual dictionaries. If bilingual and monolingual dictionaries are used to complement each other for productive purposes, then the best qualities of both can be used.

Bilingualised dictionaries contain the information that is in a monolingual dictionary plus a translation of the head word.

Evaluating dictionaries

Which of these three types – monolingual, bilingual, bilingualised – is the best? Which particular dictionary is the best one to buy? There are

several ways of answering these questions. One is to examine and compare the kinds of information that dictionaries provide. A second is to see what learners prefer and actually use. A third is to look at the effects of use of the different types of dictionary on text comprehension, language production and understanding dictionary entries.

The kinds of information in dictionaries

One way of surveying the kinds of information that dictionaries provide is to relate it to what is involved in knowing a word (see chapter 2). Discussion of these various types of information can be found in the numerous reviews of particular dictionaries (for example, Bauer, 1980 and 1981; Hartmann, 1982; Benson, 1995), comparative reviews of dictionaries (Herbst, 1996; Bogaards, 1996; *International Journal of Lexicography* (1989) 2:1) and general discussions of learners' dictionaries (Béjoint, 1981; Tickoo, 1987; Hartmann, 1992).

Table 8.9 relates the various kinds of information in dictionaries to what is involved in knowing a word. The table does not include some types of information which occur in some dictionaries and which can help learners, particularly information about 'false friends' and common errors. Nor does the table deal with the way in which the various bits of information are structured and signalled in dictionaries.

The learner can benefit not only from the type of information in the dictionary but also from the way it is presented. Baxter (1980) argues that using a monolingual dictionary makes learners realise that meaning can be conveyed by a definition as well as by a single word. This provides learners with the basis for a strategy in their spoken English – using a paraphrase based definition to make up for gaps in their productive vocabulary. Bilingual dictionaries on the other hand encourage the idea that a meaning should be expressed through a single appropriate word; they discourage the use of paraphrase.

Laufer (1992a) compared example sentences made by lexicographers with those chosen from a corpus. She found that lexicographers' examples were better for comprehension, and similar to corpus based examples for production. Her study also suggested that understanding corpus based examples required a larger vocabulary size. Laufer (1993) found that examples alone did not provide as much help for comprehension as a definition. A definition plus examples gave greater help than either of these sources alone.

When evaluating dictionaries, considering the kinds of information presented in dictionaries and the ways in which the information is organised and presented, it is important to distinguish the goals of

Table 8.9. *Dictionary information and what is involved in knowing a word*

Form	spoken	R	
		P	pronunciation, alternative pronunciations
	written	R	
		P	spelling, hyphenation (syllabification)
	word parts	R	etymology
		P	inflections, derived forms
Meaning	form and meaning	R	derived forms, etymology, examples
		P	
	concept and referents	R	meanings, illustrations
		P	examples
	associations	R	examples
P		synonyms, opposites, superordinates	
Use	grammatical functions	R	
		P	grammatical patterns, examples
	collocations	R	
		P	collocations, examples
	constraints on use (register, frequency . . .)	R	
P		frequency, register, style, etc. (see Hartmann, 1981)	

Note: In column 3, R = receptive knowledge, P = productive knowledge.

dictionary use: comprehension, production and learning. It is also appropriate at this point to consider a few preliminary practical issues like the following.

- How much can learners afford to pay for a dictionary?
- Is the physical size of the dictionary an important consideration? Do learners have to carry it around? Does it have to be a pocket sized dictionary?
- Are learners of a high enough level of proficiency to be able to understand definitions in a second language? Usually this requires a vocabulary of 2,000 words or more.

Choosing a dictionary for comprehension. Using a dictionary for comprehension or decoding involves using the dictionary to look up the meanings of words which have been met in reading or listening. Such a dictionary should have the features described in Table 8.10. The features are ranked in order of their importance with the most

Table 8.10. *Features and ways of checking the features of a learners' dictionary to be used to look up word meanings*

Features	Tests
1. The dictionary should contain lots of words and word groups.	<ul style="list-style-type: none"> • See how many words the introduction says it contains. • Count ten pages at random calculating how many words per page there are and multiply by the total number of pages in the dictionary.
2. The meanings should be easy to understand.	<ul style="list-style-type: none"> • Look up words in one of Diack's (1975) tests. • Look up some useful word groups. • Look in the introduction to see if the dictionary uses a limited defining vocabulary. • Look at entries for ten words to see if the meanings are easy to understand, and to see if first language translations are provided.
3. Derived words and word groups should be easy to find.	<ul style="list-style-type: none"> • Look to see if derived forms, especially irregularly spelled ones, are listed separately. • Look to see if important idioms are entered under each of their parts.
4. The meanings should be easy to find.	<ul style="list-style-type: none"> • Look at some entries to see if the most common meanings are listed first. • Look at some entries to see if different parts of speech get separate entries or clear sub-entries.
5. There should be examples and collocations to guide the search and confirm that the appropriate meaning has been found.	<ul style="list-style-type: none"> • Look at some entries to see how many examples are given. Are the examples easy to understand? • Look at some entries to see if collocations are provided.

important first. This list of features is very short (see, for example, reviews by Bogaards (1996) and Herbst (1996) for very detailed consideration of an extensive range). The list is intended to cover the most important features, to be able to be applied reasonably quickly, and to not require great skill or background knowledge in application. Judgements based on the application of this list could be very usefully supplemented by reading more detailed reviews, especially comparative reviews of any dictionaries under consideration.

Choosing a dictionary for production. Table 8.9 (see p. 292) listed the features that could occur in a dictionary that aims to provide full information on the receptive and productive aspects of knowing a word. Table 8.11 indicates what a teacher or learner should look for when choosing a dictionary aimed at providing information for speaking and writing.

The first criterion, finding a word, may not be satisfied very well by most monolingual dictionaries. The *Longman Language Activator* attempts to provide access to unknown forms solely through the second language although it has been criticised as being a little complex to use (Benson, 1995). However, as most learners would benefit from training in dictionary use, it is reasonable to provide training in the use of more complex dictionaries if they provide the types of advantages that the *Activator* provides.

Learners' preferences

Surveys of learners' preferences and use indicate that bilingual dictionaries are the preferred option for most learners (see Laufer and Kimmel (1997) for a review; Atkins and Varantola, (1997)). Baxter's (1980) survey of his Japanese university students showed that the students overwhelmingly used bilingual rather than monolingual dictionaries.

Dictionaries and language use

In a study of bilingualised dictionaries, Laufer and Kimmel (1997) found that some learners used only the translation in the dictionary entry while others used only the monolingual definition, others varied for different words between using the translation and monolingual definition, and others used both. Laufer and Kimmel argue that, because people use dictionary information in such a range of different ways, a bilingualised dictionary is preferable because it allows for such use.

Laufer and Hadar (1997) found that bilingualised dictionaries

Table 8.1.1. *Features and ways of checking the features of a learners' dictionary to be used for writing or speaking*

Features	Tests
1. There should be ways of finding the appropriate word.	<ul style="list-style-type: none"> • See if the dictionary is bilingual. • See if the dictionary provides ways of accessing the word through thesaurus-like keywords (as in the <i>Longman Language Activator</i>). • See if the dictionary provides opposites, synonyms, superordinates and other related words as a part of an entry.
2. The dictionary should provide information about constraints on use of the word.	<ul style="list-style-type: none"> • See if the dictionary contains frequency information. • See if the dictionary contains codes telling if the word is formal, colloquial, rude or old fashioned. • Look in the introduction to see the range of codes used.
3. The dictionary should provide plenty of understandable example sentences as models for use.	<ul style="list-style-type: none"> • Count how many examples are provided for each word and different uses of a word. • Check if each of the examples for an entry is different enough to provide different kinds of information for use.
4. The dictionary should contain easily understood information about the grammar and collocations of the word.	<ul style="list-style-type: none"> • Look in the introduction to see the range of information provided. The minimum should be part of speech, count/non-count for nouns, and verbs should have their patterns indicated. • See how easy it is to understand the information provided.
5. The dictionary should show the spelling of inflected and derived forms.	<ul style="list-style-type: none"> • See if the entry for the base form provides access to the inflected and derived forms. • See if alternative spellings are provided.
6. The dictionary should show how the word is pronounced.	<ul style="list-style-type: none"> • See if the pronunciation of the word is indicated. • Decide if the pronunciation guide is easy to use.

generally gave better results than bilingual and monolingual dictionaries on comprehension and production tests. The more skilled users were, the better they performed with the monolingual dictionary. However, the bilingualised dictionary users still achieved better results.

Dictionary use and learning

Two major themes of this book are:

- Learning any word is a cumulative process. We cannot expect a word to be learned in one meeting and so we need to see each meeting as a small contribution to learning.
- Learning a word occurs across a range of different learning conditions. The position taken in this book is that those conditions should involve roughly equal proportions of the four strands of meaning-focused input, language-focused learning, meaning-focused output and fluency development. These strands provide partly overlapping, partly differing kinds of knowledge.

We can apply these two ideas to the role of dictionaries in language learning. Dictionary use is a kind of language-focused learning: the deliberate, explicit study of words. It is thus only one of a range of sources of information about words. Dictionary makers and their critics set a very high standard for dictionary production. This is admirable and worth keeping to, because it will improve the information available in dictionaries. Learners, however, will only gain a small amount of information from any one dictionary look-up. This information may usefully add to what is already known and may be added to in later meetings with the word in a variety of ways, including further dictionary use. Expectations of what will be learned about words from dictionary use should not be too high, and teachers and learners should make efforts to see that this knowledge is added to through other encounters with the word. One of the most effective ways of encountering words is through deliberate study, which we will now look at in the final part of this chapter.

Learning from word cards

The term 'learning from word cards' will be used to describe the formation of associations between a foreign language word form (written or spoken) and its meaning (often in the form of a first language translation, although it could be a second language definition or a picture or a real object, for example). This term has been deliberately chosen

to connect this kind of learning with a particular strategy and to avoid confusion with other terms such as ‘list learning’ (Griffin and Harley, 1996), ‘paired associate learning’ (Carroll, 1963; Higa, 1965), and ‘learning word pairs’ (Nation, 1982). As we shall see, list learning is not a desirable strategy if the order of the items in the list cannot be easily changed. Paired associates – referring to the association between form and meaning – is not a very transparent term, and word pairs implies that the meaning has to be expressed as a single word.

In the simplest form of learning from word cards, a learner writes a foreign word on one side of a small, easily carried card and its first language translation on the other. The learner goes through a set of cards looking at each foreign word and trying to retrieve its meaning. If it cannot be retrieved the learner turns the card over and looks at the translation.

Criticisms of direct vocabulary learning

Many teachers and writers about vocabulary learning see the direct study of vocabulary not immediately connected to a particular text as being opposed to learning from context (Larson and Smelley, 1972: 263; Judd, 1978; Turner, 1983; Oxford and Crookall, 1990) and thus consider it not a useful learning activity. Oxford and Crookall’s (1990: 9–10) definition of decontextualising techniques provides the basic reasons for this dismissal of learning from word cards. ‘Decontextualizing techniques are those that remove the word as completely as possible from any communicative context that might help the learner remember and that might provide some notion as to how the word is actually used as a part of the language.’

This comment contains two criticisms: that learning from word cards is not good for remembering; that learning from word cards does not help with use of the word. Before looking at each of these criticisms, it is necessary to make the point that the use of word cards does not exclude the possibility of putting a sample sentence or collocations on the card. Oxford and Crookall (1990) and others however would still regard this as decontextualised learning and thus undesirable because the word is not in a ‘communicative’ context, that is, it is not being used for a communicative purpose.

Decontextualised learning and memory

The first criticism is that lack of context makes vocabulary learning difficult. Judd (1978: 73) comments that words taught in isolation are

generally not remembered. There is evidence that the presence of a sentence context can help with making the word form–word meaning association (Laufer and Shmueli, 1997), but there is also an enormous amount of evidence that shows that even without a sentence context large numbers of words can be learned in a short time and retained for a very long time.

Teachers and course designers greatly underestimate learners' capacity for the initial learning of foreign vocabulary. Thorndike (1908) found that learners could average about 34 German–English word pairs per hour (1,030 words in 30 hours). The least efficient of his learners averaged nine per hour (380 words in 42 hours) and the most efficient 58 per hour (1,046 words in 18 hours). After 42 days more than 60% of the words were still retained. Webb (1962) gained even more spectacular results in a continuous six-hour learning session. Like Thorndike, Webb found wide variation in achievement among learners. Some learners mastered only 33 lists of six English–Russian pairs (198 words) in six hours, an average of 33 word pairs per hour. Other learners mastered 111 lists (666 words) in under four hours, an average of about 166 words per hour. Both Thorndike and Webb found no decrease in learning capacity as learning progressed. Webb found that after five hours of continuous learning, learning and recall were not less than in the first hour of learning. In fact, there was an increase in learning capacity as the experiment progressed. Thorndike (1908), and also Anderson and Jordan (1928), comparing tests covering several weeks, noticed that initially fast learners still retained a greater percentage of words than slower learners. That is, fast learners are not fast forgetters.

The data on the number of repetitions required for learning is just as surprising. Lado, Baldwin and Lobo (1967) found that college students who had completed at least six credits of college Spanish achieved recognition scores averaging 95% and recall scores averaging 65% after meeting each word pair once in a 100-word list. The word pairs were infrequent Spanish words with English translations accompanied by pictures. Crothers and Suppes (1967) found that after seven repetitions of 108 Russian–English word pairs almost all of the learners had mastered all of the words. After six repetitions of 216 word pairs most learners had learned at least 80% of the words. Learning rates also tended to increase as the experiments progressed, thus showing the existence of a 'learning to learn' effect. In their study of indirect vocabulary learning in context, Saragi, Nation and Meister (1978) found that on average the number of encounters required for

most learners to recognise the meaning of a word was around sixteen. In this experiment the learners did not know that they would be tested on the new vocabulary and did not consciously study it while reading.

Studies of very long-term memory show that the results of deliberate learning persist over several years (Bahrick, 1984; Bahrick and Phelps, 1987). Beaton, Gruneberg and Ellis (1995) studied a learner who had learned a 350 word Italian vocabulary using the keyword technique ten years previously but who had not had any opportunity to use the knowledge (the trip to Italy did not happen!). Ten years later it was found he remembered 35% of the test words with spelling fully correct and over 50% with minor spelling errors. After looking at the vocabulary list for ten minutes, recall increased to 65% (fully accurate) and 76% (some minor spelling errors). After one and a half hours' revision, recall was near 100%.

There is thus plenty of evidence that, for the simple word form–word meaning aspect of vocabulary learning, direct learning from word cards is an efficient and highly effective practice. However, critics say that such learning has little to do with language use, the second major criticism of learning from word cards.

Decontextualised learning and use

In chapter 2 we looked at what is involved in knowing a word. In its simplest form, learning from word cards helps with learning the written form of the word, learning the concept of the word and making the connection between form and meaning. These are three of the nine aspects involved in knowing a word. Learning from word cards can also provide some knowledge of the grammar of the word, particularly its part of speech, its spoken form and perhaps one or two collocations.

There are many aspects of knowing a word that are not effectively covered by learning from word cards, especially constraints on use of the word, the full range of collocations and grammatical patterns in which it occurs, the variety of referents and related meanings the word can have and its various morphological forms. Table 8.12 lists the aspects of knowing a word indicating which ones are most helped by learning from word cards, which ones are partly helped, and which are poorly dealt with by this strategy.

Note that word cards can be used for both receptive and productive learning.

A similar table could be designed for incidental vocabulary learning from context where a different range of aspects would be marked. The

Table 8.12. *Aspects of word knowledge dealt with by learning from word cards*

Form	spoken	R	
		P	
Meaning	written	R	✓✓
		P	✓✓
	word parts	R	
		P	
Use	form and meaning	R	✓✓
		P	✓✓
	concept and referents	R	✓
		P	✓
	associations	R	
P			
Use	grammatical functions	R	✓
		P	✓
	collocations	R	✓
		P	✓
	constraints on use (register, frequency . . .)	R	
P			

Notes:

In column 3, R = receptive knowledge, P = productive knowledge.

In column 4, ✓✓ = well dealt with, ✓ = partly dealt with.

point of this kind of analysis is to show that any one way of dealing with vocabulary is not efficient in helping learners gain control of all aspects of word knowledge. It is necessary to see learning from context and learning from word cards as complementary ways of learning which overlap and reinforce each other and which also give rise to some different kinds of knowledge. The strength of learning from word cards is that it is focused, efficient and certain. The strength of learning from context is that it places words in contexts of use, so that the conditions of learning closely resemble the conditions under which the words will need to be used.

Part of the criticism that learning from word cards does not help with the use of the word relates to the nature of word meaning. Some writers take the position that the meaning of words comes from the context in which it occurs. Contexts, not dictionaries, determine meaning (Burroughs, 1982: 54). Firth (1957) however, saw collocation as only one kind of meaning. A similar position is taken in this book.

That is, learners need to know a generalised underlying concept for a word and also need to know the particular uses and range of referents of this underlying concept. Learning from word cards is a very effective way of learning the underlying concept. Meeting words in context makes learners aware of how this concept changes to suit particular contexts and the range of contexts in which the word can be used.

So far, we have looked at two important criticisms of learning from word cards. The first, that word cards are not good for remembering is simply wrong; the research shows otherwise. The second criticism, that word cards do not help with the use of words, is largely correct, but it takes the incorrect view that there are no other things to learn about words. Learning formal features of a word, its meaning, and connecting the form to the meaning are prerequisites for using a word. As well as learning through the use-based strands of meaning-focused input, meaning-focused output and fluency development, there is considerable benefit in learning through language-focused learning of which learning from word cards is one strategy.

The contribution of decontextualised learning

There is a third criticism of the direct study of vocabulary, one mainly put forward by first language researchers (Anderson and Nagy, 1992). Although this criticism focuses mainly on the teaching of vocabulary, it has had the effect of discouraging the teaching of *strategies* for direct vocabulary learning. The argument is that there are so many words in the language and it takes so much time to effectively learn a word that direct study is an inefficient procedure for vocabulary growth. Learners are better off concentrating on reading because their long-term vocabulary growth will be greater as a result of incidental learning from context.

This criticism is largely correct for native speakers of English, who begin school already knowing several thousand words. For the following reasons, it is certainly not true for non-native speakers of English who do not know the high-frequency words of the language, or who need to quickly increase their knowledge of low-frequency words.

Firstly, all words in English are not equally valuable. Higher frequency words are much more useful than low-frequency words; there is a very good return for the time and learning effort spent on high-frequency words. Secondly, learning from word cards can be a way of quickly raising learners' awareness of particular words so that when they meet these words in reading and listening they will be noticed and more easily learned. That is, direct learning is a very useful complement

to learning from context, and just one step in the cumulative learning of a word. In general, critics of direct vocabulary learning need to take a broader view of what is involved in knowing a word and how vocabulary can be learned.

The values of learning from word cards

The values of direct learning of vocabulary are: (1) it is efficient in terms of return for time and effort, (2) it allows learners to consciously focus on an aspect of word knowledge that is not easily gained from context or dictionary use and (3) it allows learners to control the repetition and processing of the vocabulary to make learning secure.

In the section on repetition and learning in chapter 3 (see pp. 74–81), we looked at the amount of learning within a set time and the retention of this knowledge over long periods of time. There are also studies comparing incidental learning with intentional learning which invariably show that a deliberate, intentional approach results in much more learning in a set time than incidental learning. The spacing of repetition and the use of mnemonic devices is best done at learners' leisure when they can choose the most suitable time and the most suitable way to help learning stick. There is no doubt that for certain kinds of knowledge direct learning is highly efficient and enduring.

N. Ellis (1995) argues that learning word meaning and linking the word form to the meaning is especially suited to explicit conscious learning. One reason why this might be so is that learners can make use of deliberate mnemonic strategies like the keyword technique.

The use of word cards provides an opportunity for learners to focus on the underlying concept of a word that runs through its various related uses. This has several values. Firstly, it reduces the number of words to be learned. If a learner can see *kiss* as in *kiss someone's lips* and *kiss* as in *The wind kissed his face* as being essentially the same word even though they might be translated by different words in the first language, then there are fewer words to learn. Dictionaries do not encourage this view, rightly preferring to separate as many different uses as possible in order to make it easier for the reader to find the meaning for a particular context. For example, the entry for *knee* in *Collins COBUILD English Language Dictionary* has the following divisions:

- 1.1. the place where your leg bends
- 1.2. the place around or above your knee when you sit
2. the knee in a piece of clothing

3. to be on your knees
4. to bring a person or country to their knees

All of these uses share a clear common meaning and learners should be aware of this. Learners can do this analysis of underlying meaning as a way of preparing their word cards.

Secondly, looking at the underlying meaning of a word has an educational value. It demonstrates to learners that there is not a one-to-one correspondence between a word in the second language and the first language word. It shows learners that different languages categorise the world in different ways. Deliberate attention to concepts can also reveal the metaphors that users of the second language accept as a normal part of their view of the world (Lakoff and Johnson, 1980).

The word card strategy

Learning from word cards is a way of quickly increasing vocabulary size through focused intentional learning. The strategy is one that many learners already utilise but often their use is not as effective as it could be. The design of the strategy draws heavily on research on paired associate learning, mnemonic techniques and vocabulary learning. In the final section of this chapter, we will look at how learners can be trained in its use but let us now examine the steps in the strategy.

Choosing words to learn

The first step is to choose suitable words to learn.

Learn useful words. Priority should be given to high-frequency words and to words that clearly fulfil language use needs.

Avoid interference. Words that are formally similar to each other, or that belong to the same lexical set, or which are near synonyms, opposites, or free associates should not be learned together (Higa, 1963; Tinkham, 1993 and 1997; Waring, 1997b; Nation, 2000a).

Making word cards

The second step is to prepare the word cards. Small cards (around 5 × 4 cm) should be used so that they can be easily carried around.

Put the word on one side and the meaning on the other to encourage recall. The word or phrase to be learned is written on one side of the card and its meaning on the other. The word can be written in a sentence context instead of as a single item if this makes learning easier.

Use first language translations. Research shows (Lado, Baldwin and Lobo, 1967; Mishima, 1967; Laufer and Shmueli, 1997) that learning is generally better if the meaning is written in the learners' first language. This is probably because the meaning can be easily understood and the first language meaning already has many rich associations for the learner. Laufer and Shmueli found that L1 glosses were superior to L2 glosses in both short-term and long-term (5 weeks) retention, irrespective of whether the words were learned in lists, sentences or texts.

One of the criticisms made of bilingual dictionaries, learning from lists and learning from word cards is that the use of the first language encourages learners to think that there is a one-to-one correspondence between words in the second language and words in the first. Learners need to be shown that this is not so, and looking for underlying meanings is a good way of showing this. Learners also need to be shown that there is not a one-to-one correspondence between a second language word and a second language definition, and between a second language word and a picture. The representation of meaning is a very inexact process and learners should be aware of this.

Use pictures where possible. In some cases, the meaning of a word will be best expressed by a diagram or picture. Experiments involving pictures as a means of learning productive vocabulary indicate that questions like 'Which are more efficient, pictures or translations?' are not appropriate. Pictures and translations have different effects and so should be regarded as complementary sources of meaning rather than alternatives. Thus, for receptive learning, Lado, Baldwin and Lobo (1967) found that simultaneous presentation of both a written and spoken translation *accompanied* by a corresponding picture was superior to other arrangements and alternatives. Experiments by Kopstein and Roshal (1954) and Deno (1968), while favouring pictures over translations, noted the differing effects of pictures and translations under various learning and teaching conditions. Deno concluded that in his experiment pictures were not encoded in the same way as words (*ibid.*: 206). Webber (1978) similarly found a superior effect for pictures.

A further argument for regarding pictures and translations as complementary is that different learners prefer different sources of meaning. Kellogg and Howe (1971) compared pictures and translations for learning Spanish words. They concluded that learning was significantly faster with pictures than with written words (*ibid.*: 92). This however did not apply to all learners. Twenty-five out of 82 learners learned faster with words than with pictures. So, although on average picture stimuli gave better results than words, a significantly

large group within the class learned better from words. A teacher would achieve better results for all the learners by providing both words and pictures rather than by providing the form favoured by the majority.

Not all words are picturable, but for those that are, the actual drawing of the picture on the card could improve memory. A suitable picture is an instantiation of the word and this may result in a deeper type of processing than a first language translation which does not encourage the learner to imagine a real instance of the meaning of the word.

Keep the cards simple. Other kinds of information – collocates, etymology, constraints, grammatical pattern – could be put on the word card, but it is best to see word cards as only one step in the cumulative process of learning a word and not expect too much from this strategy alone.

Suit the number of words in a pack to the difficulty of the words. In a series of experiments, Crothers and Suppes (1967) investigated the effect on learning of different numbers of Russian–English word pairs in a list. If, for example, learners are required to learn 300 foreign word pairs, is it better for the learners to study 100 of them several times first, then study the second 100 several times, and then the third 100, or is it better for the learners to try to learn all the 300 word pairs as one list? When 300 words are learned as one list, the learners go through the whole 300 words once, then start at the beginning of the list again and continue going through the list until all the words are known. Crothers and Suppes studied the following list sizes: 18, 36, 72, 100, 108, 216 and 300 word pairs.

When difficulty was low, it was more efficient to use the largest group of words. When difficulty was high, then the smallest group of words was the best. Difficulty here has several meanings: difficulty is high when there is limited time for learning and learners have no control over the time they can spend on each item; difficulty is high when learners must recall and not just recognise the new words; difficulty is also high when the words themselves are difficult because, for example, they are difficult to pronounce and their English translations are adjectives, adverbs or verbs, rather than nouns (see Rodgers, 1969; Higa, 1965).

Using the cards

The quality of learning from word cards will depend on the way that they are used.

Use recall. Writing the word on one side and its meaning on the other allows the learner to be able to retrieve the meaning of the word from memory. Having to retrieve the meaning results in far superior learning to seeing the word and its meaning at the same time (Baddeley, 1990; Landauer and Bjork, 1978). This is one reason why cards are better than vocabulary lists and vocabulary notebooks as a means of learning. In lists and notebooks, the word form and its meaning are usually both visible together. If lists and notebooks are to be used to help learning, then the meaning needs to be covered up so that learners have the chance to retrieve the item from memory.

Learn receptively, then productively. It is best to learn words receptively (see the word, recall the meaning) first, and then learn them productively (see the meaning, recall the word form). There are two factors to consider here: the difficulty of the learning, and the way the learning will be used. Receptive learning is usually easier than productive learning (but see Stoddard, 1929; Griffin and Harley, 1996; Waring, 1997b). That is, it is usually easier to learn to recall a meaning for a given word than it is to recall a word form for a given meaning. In the early stages of learning a language it is quite difficult to remember vocabulary because there is not much other knowledge of the second language for the vocabulary to fit into. It is thus better to learn vocabulary receptively first and then productively later. Learning productively means turning over the pack of word cards, looking at the meaning and trying to recall the second language word.

Numerous experiments have also shown that recall is better if the direction of learning (receptive or productive) matches the direction of testing. That is, receptive learning favours receptive testing, productive learning favours productive testing. This testing or use effect is much stronger than the learning effect (Stoddard, 1929; Griffin and Harley, 1996; Waring, 1997b). This means that if words are to be learned for listening or reading (receptive use) then receptive learning is best. If words are to be learned for speaking or writing (productive use), then productive learning is best. If both receptive and productive use is needed, then vocabulary should be learned in both ways. Griffin and Harley (1996) suggest that if, for motivational or time reasons, only one direction of learning is possible then learning productively (see the meaning, recall the second language word) is probably best. All the relevant experiments show that learning is bi-directional. That is, by learning productively, some receptive knowledge is also developed, and vice versa.

Keep changing the order of the cards in the pack and put difficult words near the beginning. Learning words from cards involves

making connections, particularly between the word form and its meaning. However, when several words are learned at the same time then other associations may be made between the different words and some of these associations do not help learning. Learning related words together can make learning more difficult because the words interfere with each other. Learning words in a set order can result in serial learning where one word helps recall of the next word in the list. If lists are being learned to be recalled and used as lists, then serial learning is a useful thing. For vocabulary learning, however, serial learning is not useful because each word needs to be recalled independently of others without having to go through a series of words. The way to avoid serial learning is to keep changing the order of the words in the pack.

The order of the words in a list has other effects on learning. In general, items at the beginning and end of a list are learned better than items in the middle. These effects are called the primacy and recency effects (Baddeley, 1990: 52). Putting difficult words near the beginning is also a way of ensuring that they get more attention.

Atkinson (1972) studied the effects of four word sequencing strategies (two of which made use of a computer and so will not concern us here) in learning written English responses to written foreign nouns. In the random order strategy the learners studied the items with no control over the order of the items. In the other strategy the learners decided for themselves which item was to be studied: 'The learner rather than an external controller determines the sequence of instruction' (*ibid.*: 124). The learners could choose items to study that had given them difficulty in earlier trials, but all the words from the earlier trials, both easy and difficult, were tested in the retention test. The learner-controlled strategy resulted in a retention gain of 53% over the random strategy, as measured by a retention test given one week after the learning. Atkinson's experiment shows an advantage of writing each word pair on its own small card rather than learning from one large list: if words are on cards then learners can change their order as a result of previous learning, and can thus give more attention to the more difficult words.

Say the words aloud or to yourself. N. Ellis (1995 and 1997) presents evidence to show that putting items into the 'phonological loop' is a major way in which items pass into long-term memory. According to Seibert (1927), silent rote repetition of vocabulary lists is not the most efficient way of learning. If foreign vocabulary is to be learned for productive purposes, then saying the words aloud brings faster learning with better retention. Seibert found that the result obtained

by studying aloud was, in every case, far better than the results obtained by studying aloud with written recall, and by studying silently. Seibert also measured the time required for relearning after two, ten and 42 days and found that after 42 days learning aloud produced a better result than the other two ways. Gershman (1970) also found that writing had no significant effect on learning. Thomas and Dieter (1987) found that practising the written form of words improved knowledge of the written form but did not contribute significantly to strengthening the word form–word meaning connection.

Put the word in a phrase or sentence or with some collocates. While there are numerous studies that examine the effect of context on vocabulary learning (Grinstead, 1915; Seibert, 1930; Morgan and Bailey, 1943; Morgan and Foltz, 1944; Gipe and Arnold, 1979; Pickering, 1982; Dempster, 1987; Griffin, 1992; Laufer and Shmueli, 1997), they differ so greatly from each other in method, quality of design and quality of reporting that it is impossible to regard them as either supporting or contradicting each other in addressing the question ‘Does context help vocabulary learning?’

If we put aside the poorly reported and poorly conducted studies and take only those that: (1) defined **context** as the target word being in a sentence context, (2) did not involve guessing but provided a gloss of the target word (either in the first language, second language or both), and (3) compared learning in a sentence context with paired associate learning, we are left with only four studies: (Seibert, 1930; Dempster, 1987; Griffin, 1992; Laufer and Shmueli, 1997).

Laufer and Shmueli compared words in isolation, words in a sentence, words in a text and words in an elaborated text. All four treatments involved the learners having access to the word form plus a gloss of the word. The sentence and list presentations were superior in both short-term and long-term retention. Laufer and Shmueli explain this superiority as being one of focus, with list and sentence presentations providing a more direct focus on the words themselves. Laufer and Shmueli tested learning by using a multiple-choice test with only English (L2) synonyms and definitions. There were no other tests looking for other aspects of knowledge that may have particularly favoured learning in a sentence context. Such a measure, for example getting learners to suggest collocates, may have shown the sentence context condition to be even more favourable for learning.

Seibert (1930) compared productive learning of paired associates (English–French), words in a sentence context with a gloss in brackets after the word ‘On met *le mors* (“bit”) dans la bouche du cheval,’ and a mixture of paired associates and context. The learning was tested by

first asking the learners to translate the isolated first language word into the foreign language, and then getting them to translate the first language word given in the original foreign language sentence context into the foreign language. Tests were carried out at intervals of fifty minutes, two days, ten days and forty days. Paired associate learning gave higher scores than the mixed approach and the sentence context approach. No statistical procedures were used beyond finding the mean, standard deviation, and the standard deviation divided by the square root of the mean, and it is likely that the differences between the results of the treatments may not have been significant.

Griffin (1992) examined the effect of a context sentence on learning and testing. He saw the major issue in the use of context sentences as one of transfer. 'What is in question here is the ability of a word learned in a list of word-pairs to cue an appropriate response in a dissimilar test condition' (*ibid.*: 50). Griffin found that for some learners list learning may make transfer to productive use less effective but for others list learning was highly effective. The provision of a sentence context can enhance learning because more information is provided about the word; learners however have to have the ability and motivation to use this information. Griffin found that where the test involved recalling a first language translation for a second language word, there was no advantage for learning in context. The provision of a context sentence can have positive advantages for learners who can make use of it.

Dempster (1987) found no helpful effects for the use of definition plus sentence contexts compared with definition alone when measured by: (1) a definition recall test, (2) sentence completion involving recall of the form of the word and (3) writing a sentence using the word. What Dempster's results show is that presentation of words in multiple contexts does not improve definition recall. Context, however, may contribute to other aspects of word knowledge such as knowledge of the range of possible referents and collocational knowledge. Meeting the word used in different ways in a variety of contexts (Joe, 1998) may strengthen knowledge of the meaning of a word but this would require several measures of word knowledge for each word to determine the strength of the effect.

The few well-conducted relevant studies do not show a striking superiority for sentence context over isolated word but, because of the extra information that a sentence context can provide and the small amount of effort needed to add a sentence context to word cards, it is probably advisable to use such contexts on cards wherever possible.

Wang and Thomas (1995) compared the effect of the keyword technique with the 'semantic-context' strategy which involves seeing the word in a context sentence. Although the keyword technique gave superior learning, as measured by immediate testing, the memory for the words learned by the technique deteriorated more quickly so that, after a two day delay, the sentence context strategy learning was equal to or better than the keyword learning. The results of the keyword technique seem to be fragile over time.

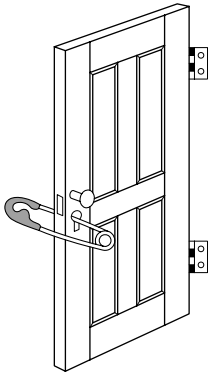
Process the word deeply and thoughtfully. N. Ellis (1995) distinguishes between learning the form of a word (what he calls the input/output specifications) and linking that knowledge of the form to a meaning. Drawing on evidence from memory research and second language learning, he proposes that learning to recognise and produce the spoken and written forms of words in a fluent way is primarily an implicit learning process. That is, it depends on practice and use. Explicit knowledge can guide this learning 'but essentially we learn to drive by driving itself, just as we learn to spell on the job of spelling or speak by speaking' (*ibid.*: 16). Linking knowledge of word forms to meaning, however, is a strongly explicit process which benefits from the use of memory tricks, thoughtful processing, deliberate analysis and elaboration, and conscious connections to previous knowledge. Although these ideas have been around for hundreds of years, it was the levels-of-processing theory by Craik and Lockhart (1972) which brought them into recent prominence.

Experiments investigating the recall of familiar non-foreign words (Craik and Lockhart, 1972; Craik and Tulving, 1975) indicate that words which do not receive full attention and are analysed only at a superficial level do not stay long in the memory. On the other hand, words that are fully analysed and enriched by associations or images stay longer. Craik and Tulving consider (1975: 290) that what learners do while studying words is more important than how motivated they are, how hard they work, how much time they spend and the number of repetitions of each word. These findings cannot be totally applied to foreign vocabulary learning. Foreign vocabulary learning requires repetition even if only because one occurrence of a word will not contain enough information for a learner to master the word. Also, recalling an already known form is a simpler task than learning an unfamiliar word form and connecting it to a given meaning. However, Craik and Lockhart's (1972) theory of the importance of the kind of operations or processing carried out on an item does receive support from experiments on the keyword technique.

The keyword technique

The keyword technique is primarily a way of making a strong link between the form of an unknown word and its meaning. It involves two steps after the learner has met the unknown word and has found or been provided with its meaning. The first step is to think of a first language word (the keyword) which sounds like the beginning or all of the unknown word. The second step is for the learner to think of a visual image where the meaning of the unknown word and the meaning of the keyword is combined. Here is an example.

If an Indonesian learner wants to learn the English word *pin*, the learner could use the keyword *pintu* which is the Indonesian word for 'door'. The learner then thinks of an image involving a door and a pin.



The technique is more clearly seen as a four part process.

1.	2.	3.	4.
unknown word	→ first language keyword	→ a mental image combining the meaning of the unknown word and the meaning of the keyword	→ meaning of the unknown word

Here are some further examples. The keywords have been chosen from a variety of languages including English. Bird and Jacobs (1999) suggest that for languages like Chinese with very limited syllable structure, it may also be useful to choose keywords not only from the first language but from known words in the second language.

1.		2.		3.		4.
fund	→	<i>fun</i> (Thai) meaning 'teeth'	→	a fund of money being eaten by a set of teeth	→	a supply of money for a special purpose
candid	→	<i>can</i> (English) meaning 'container'	→	a can with a label which honestly shows its contents	→	honest and truthful
core	→	<i>hor</i> (Serbo- Croat) meaning 'choir'	→	a choir standing on the core of an apple	→	the most important or central part

Step 2 provides a word form link between the unknown word and the keyword. Step 3 provides a meaning link between the keyword and the meaning of the unknown word. The whole sequence provides a link from the form of the unknown word to its meaning.

The unknown word, because of its formal similarity to the keyword, prompts recall of the keyword. The keyword prompts recall of the image combining the keyword meaning and the meaning of the unknown word. This image prompts recall of the meaning of the unknown word and completes the set of links between the form of the unknown word and its meaning. Instead of an image at step 3, some experimenters (Pressley, Levin and McCormick, 1980) have used a sentence which describes what the image might be, for example, 'There is a *pin* in the *pintu*.'

The keyword technique can be used with ready made keywords and images as in the examples above; this is generally recommended for younger learners and seems to work as well as self created keywords and images (Hall, 1988; Gruneberg and Pascoe, 1996). Some researchers (Fuentes, 1976; Ott, Butler, Blake and Ball, 1973) found that learners in the control group were spontaneously using keyword-like techniques.

There has been considerable research on the keyword technique. It has been found that the technique works with:

1. learners of differing achievement (Levin, Levin, Glasman and Nordwall, 1992; McDaniel and Pressley, 1984) although learners with low aptitude may find it more difficult to use the technique (McGivern and Levin, 1983)

2. learners at a variety of grade levels including very young children (Pressley, Samuel, Hershey, Bishop and Dickinson, 1981)
3. elderly learners (Gruneberg and Pascoe, 1996)
4. educationally disadvantaged learners

The technique has been used with a wide range of languages: English speakers learning English, Spanish, Russian, German, Tagalog, Chinese, Hebrew, French, Italian, Greek, and Latin words, Dutch speakers learning Spanish and Arabic speakers learning English.

The keyword technique can be used in L1 or L2 learning, for learning the gender of words (Desrochers, Gelinas and Wieland, 1989; Desrochers, Wieland and Coté, 1991) and with learners working in pairs or individually (Levin, Levin, Glasman and Nordwall, 1992). When it is used for L1 learning, the unknown word is an L1 word and the keyword is usually a higher-frequency L1 word, for example, *cat* could be the keyword for *catkin*.

The experiments evaluating the keyword technique have compared it with:

- rote learning
- use of pictures (Levin, McCormick, Miller, Berry and Pressley, 1982)
- thinking of images or examples of the meaning – instantiation – (Pressley, Levin, Kuiper, Bryant and Michener, 1982)
- context – the unknown word is placed in sentence contexts and the meaning of the word is provided – (Moore and Surber, 1992; Brown and Perry, 1991)
- added synonyms – the meaning is accompanied by other known synonyms – (Pressley, Levin, Kuiper, Bryant and Michener, 1982)
- guessing from context (McDaniel and Pressley, 1984)

The studies cited above generally show the keyword technique results in faster and more secure learning than other approaches.

The keyword technique has positive effects on both immediate retention and long-term retention (one week to ten years). This finding is not consistent as there are a few studies which suggest that long-term retention is not good with the keyword technique (Wang, Thomas, Inzana and Primicerio, 1993; Wang and Thomas, 1992 and 1995) and so such learning may need to be closely followed by some additional meetings with the words.

The effect of the keyword technique is not limited to receptive recall of a synonym. Studies have shown it to be effective for recall of definitions (Levin, Levin, Glasman and Nordwall, 1992; Avila and Sadoski, 1996), in sentence completion tasks (Avila and Sadoski, 1996), in

story comprehension (Avila and Sadoski, 1996; Pressley, Levin and Miller, 1981; McDaniel and Pressley, 1984), in writing sentences using the words studied (McDaniel and Pressley, 1984) and in productive recall (Gruneberg and Pascoe, 1996; Pressley, Levin, Hall, Miller and Berry, 1980). The keyword needs to overlap a lot in form with the unknown word for productive recall to be successful and repetition may be more effective (Ellis and Beaton, 1993). Learners find using the keyword technique an enjoyable activity (Gruneberg and Sykes, 1991) and can achieve large amounts of learning with it (Gruneberg, 1992: 180; Gruneberg and Jacobs, 1991) with some learners learning 400 words in twelve contact hours and 600 words in four days. It is unlikely that these rates could be sustained but they represent very useful initial achievements.

To be effective, learners need extended training with the keyword technique. Hall (1988) spent a total of three hours over a period of four weeks training learners in the use of the keyword technique and even this was probably not enough. As with all major vocabulary learning strategies, learners need to be brought to a level of skill and confidence where they find it just as easy to use the strategy as not. If their grasp of the strategy is unsure, then it will be rarely used. A fault with many of the experimental studies of the keyword technique is that training seems to have been very short or is not described clearly in the reports.

Several studies show that the keyword technique works well on some words (usually where keywords are easy to find) and not so well on others (Hall, 1988). It would be interesting to see if extended training in the keyword technique results in ease of use with most unknown words or if there are still problems finding keywords for many words and with some languages whose syllable structure differs greatly from the first language. Gruneberg's *Linkword* books provide keywords for a wide range of vocabulary, indicating that the only limit on finding a keyword could be the learner's imagination. In the books learners are encouraged to spend about ten seconds thinking of the image so that there really is visualisation.

The results of the experiments on the keyword technique are not unanimous, but there is a very large amount of evidence supporting its use, and if it is fitted into a balanced programme any possible weaknesses, such as long-term retention and availability for productive use, will be lessened. Research on the technique has continued at a rate far greater than its importance in learning would seem to justify, particularly when one considers other areas of vocabulary learning where we lack the support of experimental findings. Keyword studies now number well over one hundred.

Training learners in the use of word cards

The research reviewed in this chapter shows that there is value in learning vocabulary using word cards. This learning, however, must be seen as part of a broader programme involving other kinds of direct learning as well as the strands of meaning-focused input, meaning-focused output and fluency development. The research also shows that there are ways of maximising learning and learners need to know about these and how to make use of them. Some of Griffin's (1992) studies suggest the importance of informing learners about how to go about learning so that factors like transfer of learning, serial position in a list and item difficulty are taken into account to suit the language learning goal.

- Learners should know about the importance of retrieval in learning and how word cards encourage this by not allowing the word form and meaning to be seen simultaneously. They should know about receptive retrieval and productive retrieval.
- Learners should know the value of repeating and spacing learning and to include long-term review in their learning.
- Learners should know what information to include on their word cards, particularly a sentence context or some useful collocations.
- Learners should know what words to choose to put on their cards, giving particular attention to high-frequency words.
- Learners should know what to do with each word, rehearsing its spoken form and using mnemonic techniques like the keyword technique whenever a word is difficult to remember.
- Learners should keep changing the order of the cards, avoiding serial learning and putting more difficult items at the beginning of the pack so that they get more attention. They should re-form packs, taking out words now known and inserting new items.
- Learners should use small packs of cards in the early stages of learning and bigger packs when learning is easier.
- Learners should be aware of interference effects between semantically and formally related words and avoid including such related items in the same pack.
- Learners should make deliberate efforts to transfer the learning from word cards to meaning-focused language use.
- Learners should know how to monitor and reflect on their own learning, and adapt their learning procedures on the basis of this reflection.

Some of these techniques are easy to learn and require only a little explanation and discussion. Others, like the use of mnemonic devices,

choosing words to go on the cards, avoiding interference and transferring knowledge, require much more time and attention. Training in the techniques can involve:

1. Understanding what should be done. This can be tested by quizzes.
2. Observing and hearing about others' learning experiences and discussing strengths and weaknesses in what was observed.
3. Performing learning tasks using word cards and reporting and reflecting on the experience.
4. Monitoring and training others in the use of word cards.

This training requires planning and a suitable allocation of time. The principle of spaced retrieval should be applied to the training procedure and teachers should plan a mini-syllabus spread over several weeks to train learners in the effective use of word cards.

Teachers should be able to justify to themselves and to others the value of spending time training learners in the use of word cards. These justifications could include the following:

- The word card strategy can be applied to both high-frequency and low-frequency words. It is widely applicable.
- Direct deliberate learning is faster and stronger than incidental learning.
- Direct learning can help incidental learning by raising consciousness of particular words and providing knowledge that can be enriched and strengthened through incidental meaning-focused learning.
- Learners differ greatly in their skill at direct learning. Training is likely to reduce these differences.
- Learners spontaneously do direct learning but they do not always do it efficiently. Training can increase their efficiency.

Learning to use word cards should not be seen as an alternative to other kinds of learning. It should be seen as a useful and effective complement and simply one part of a balanced vocabulary-learning programme.

The three word study strategies examined in this chapter: using word parts, dictionary use and using word cards, are important in helping learners quickly increase their vocabulary size. The deliberate nature of the strategies results in substantial gains. When these are supplemented by opportunities to meet and use these words in listening, speaking, reading and writing, the vocabulary programme has a very strong base.