1 Introduction

1.1 Introduction: the basics

Here we look at the basics of corpus linguistics, from what a corpus is to how to build one. We outline the basic functions of corpus software, such as generating word frequency lists and concordance lines of words and clusters (or chunks). We also try to give an idea of the wide range of applications of a corpus to fields as diverse as forensic linguistics and language teaching. Creating a corpus also brings up a number of issues, for example, whose language it is representing. This is particularly the case in relation to corpora of English in the context of native versus non-native speaker users of the language.

1.2 What is a corpus and how can we use it?

A corpus is a collection of texts, written or spoken, which is stored on a computer. In the past the term was more associated with a body of work, for example all of the writings of one author. However, since the advent of computers large amounts of texts can be stored and analysed using analytical software. Another feature of a corpus, as Biber, Conrad and Reppen (1998) point out, is that it is a *principled* collection of texts available for *qualitative* and *quantitative* analysis. This definition is useful because it captures a number of important issues:

A corpus is a principled collection of texts

Any old collection of texts does not make a corpus. It must represent something and its merits will often be judged on how representative it is. For example, if we decided to build a corpus representing classroom discourse in the context of English Language Teaching (ELT), how do we design it so as to best represent this? Would four hours of recordings from an intermediate level class in a London language school suffice? Great care is usually taken at the design stage of a corpus so as to ensure that it is representative. If we wished to build a corpus to represent classroom discourse in ELT, we would have to create a design matrix that would ideally capture all the essential variables of age, gender, location, type of school (e.g. state or private sector), level, teacher (e.g. gender, qualifications, years of experience, whether native or non-native speaker), class size (large groups, small groups or one-to-one), location, nationalities and so on. It is important to scrutinise how a corpus is designed when considering buying or accessing one, or when evaluating any findings based on it. The design criteria of a corpus allow us to assess its representativeness. Crowdy (1993), Biber (1993), McEnery and

Wilson (1996), McCarthy (1998), Biber, Conrad and Reppen (1998), Kennedy (1998), Meyer (2002), Thompson (2005a), Wynne (2005a), Adolphs (2006) and McEnery, Xiao and Tono (2006), among others, are essential reading if you are considering designing your own corpus.

A corpus is a collection of electronic texts usually stored on a computer

Because corpora are stored on a computer, this allows for very large amounts of text to be amassed and analysed using specially designed software. Language corpora can be composed of written or spoken texts, or a mix of both, and nowadays the capability exists to add multimedia elements, such as video clips, to corpora of spoken language. If it is a corpus of written language, texts may be entered into a computer by scanning, typing, downloading from the internet or by using files that already exist in electronic form.[1] For example, you may wish to build a corpus of your students' written work over a one-year period so as to track their vocabulary acquisition and to compare this with other data. This could be done easily by asking your students to email you their work (see section 1.4 for further details on creating your own corpus).[2] Corpora of spoken language, on the other hand, are much more time-consuming to assemble. For instance, if you wished to build a corpus of your own classroom interactions, you would first need to record the classes and then transcribe them. One hour of recorded speech usually yields approximately between 12,000 and 15,000 words of data and it takes around two days to transcribe, depending on the level of coding you decide to use in transcription (O'Keeffe and Farr 2003 discuss the pros and cons of building versus buying a corpus). For example, a spoken corpus may be coded for different speaker turns, interruptions, speaker overlaps, truncated utterances, extra-linguistic information such as 'giggling', 'door closes in background', 'dog barking' (see section 1.4). More detailed transcriptions include prosodic information as found in the London-Lund Corpus (Svartvik and Quirk 1980), the Lancaster/IBM Spoken English Corpus (Knowles 1990; Leech 2000) and the Hong Kong Corpus of Spoken English (Cheng and Warren 1999, 2000, 2002). Not surprisingly, written corpora are much more plentiful and usually much larger than spoken ones.

A corpus is available for qualitative and quantitative analysis

We can look at a language feature in a corpus in different ways. For example, using a corpus of newspapers, we could examine how many times the words *fire* and *blaze* occur. This will give us quantitative results, that is, numbers of occurrences, which we can then compare with frequencies in other corpora, such as casual conversation or general written English. This might lead us to conclude that the word *blaze* is more frequently used in newspaper articles than in general English conversation or writing, when talking about destructive outbreaks of fire. This conclusion is arrived at through quantitative means. However, another approach is to look more qualitatively at how a word or phrase is used across a corpus. To do this, we need to look beyond the frequency of the word's occurrence.

[1] It is essential to remember that most texts are covered by copyright, and that permission to use a text may need to be obtained before it can be stored or exploited in any way.

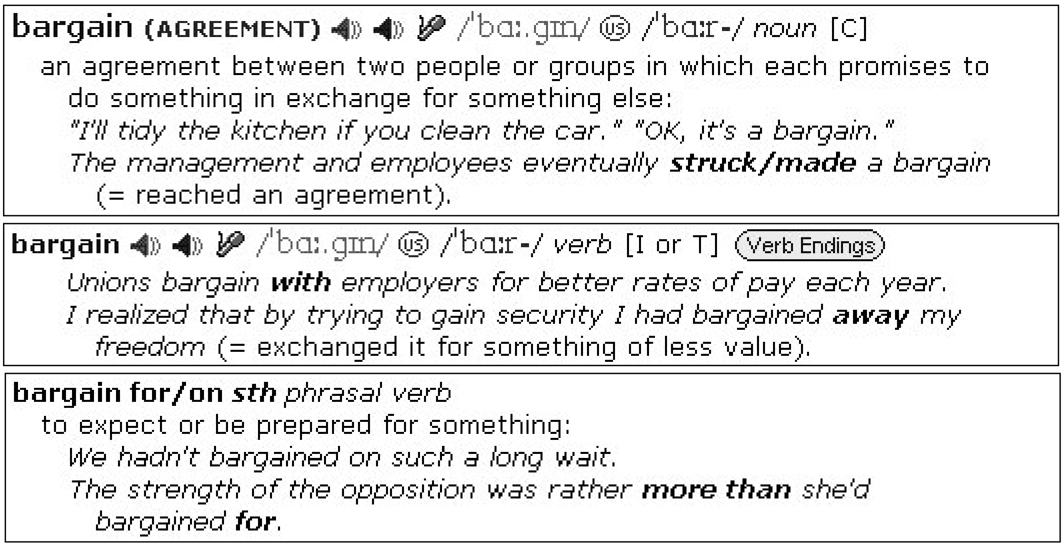
[2] Teachers may find that their institutions have strict ethical guidelines for using students' work in research, and these should always be observed.

As we will exemplify below, looking at concordance lines can help us do this and to see qualitative patterns of use beyond frequency.

1.3 Which corpus, what for and what size?

There is no one corpus to suit all purposes. The one we choose to work with is the one that best suits our needs at any given time. Begin with the question: *why do I need to use a corpus?* The answer to this question will vary widely. For example, some may wish to use a corpus for research purposes to study how a lexical item or pattern is used. Others may wish to compare the use of an item in different language varieties, for example *will* and *shall* in American versus British English (see Carter and McCarthy 2006: 880–881). In such cases, the corpus which is chosen must best represent the language or language variety, and, if comparing varieties, the corpora themselves must be comparable. For example, comparing *will* and *shall* in American and British English using a corpus of American academic textbooks from the 1960s and a corpus of contemporary spoken British English will obviously yield flawed results (unless one is conducting a study of language change and the possible backwash effects of spoken language on written language). In a pedagogic context, a corpus may also be utilised for reference purposes, for example, a teacher may advise students to search a corpus to find out what preposition most commonly follows *bargain* as a verb. Many of these types of questions can also be answered by looking things up in a dictionary. The advantage of looking up a lexico-grammatical query in a corpus is that it provides us with many examples of the search item in its context of use. However, a corpus will not tell us the meaning of the word or phrase. This is something that we have to deduce from the many examples that are generated. Combining a dictionary and a corpus can be a valuable route in a pedagogical context. Let us look the word *bargain* using a dictionary and some corpus examples:

Figure 1: Main entries for *bargain* from the *Cambridge Advanced Learner's Dictionary* (CD-ROM 2003)



bargain (AGREEMENT) 🔊 🔊 /ˈbɑː.gɪn/ US /ˈbɑːr-/ *noun* [C]
an agreement between two people or groups in which each promises to do something in exchange for something else:
"I'll tidy the kitchen if you clean the car." "OK, it's a bargain."
The management and employees eventually ***struck/made*** *a bargain* (= reached an agreement).

bargain 🔊 🔊 /ˈbɑː.gɪn/ US /ˈbɑːr-/ *verb* [I or T] Verb Endings
Unions bargain ***with*** *employers for better rates of pay each year.*
I realized that by trying to gain security I had bargained ***away*** *my freedom* (= exchanged it for something of less value).

bargain for/on *sth* *phrasal verb*
to expect or be prepared for something:
We hadn't bargained on such a long wait.
The strength of the opposition was rather ***more than*** *she'd bargained* ***for***.

Figure 2: Sample of concordance lines for *bargain* from the Cambridge International Corpus (see Appendix 1 for details)

```
1   blic-sector unions have been allowed to bargain away jobs for pay.    In a deal
2   over ... The chancellor also asks us to bargain away whatever obligations or int
3   : your loss is Southampton's gain.    A bargain buy at pounds 1 million this sea
4   weapons; and that the Russians will not bargain for cuts in something that Labou
5   in his shirt front. Scurra has struck a bargain,' he called out as he bustled fu
6   e, and even the possibility of making a bargain,he turned his back on them for
7   tologists had kept to their side of the bargain;he'd make their deaths quick...
8   he airport.'    I see now why this is a bargain holiday. Once the clients have p
9   erm       these really s5 sort of quite bargain holidays where you take+
10        Chuffed.              You little bargain hunter you.              laughs
11    Events' are manna from heaven for the bargain hunter.    When shares get marke
12  ost of the phone calls I took were from bargain hunters,' Steve says.    While L
13   junkies, pop history freaks and casual bargain hunters. Record Collector magazi
14  as keen on trail running as they are on bargain hunting. A spokeswoman for PR co
15   and you'll lose a lot of wine into the bargain.    Reading a champagne label
16  point and got a little success into the bargain, she'll go back to what she was
17   And it's invariably dishonest into the bargain."    So how has he managed to we
18  tanding but seem pretty boring into the bargain.    THERE was a moment about a t
19  t free tickets. He's a widower into the bargain, they say. Quite a catch for som
20  ess accepted separate electorates and a bargain was struck over the distribution
21  chaser and it really is if you like the bargain we will strike and I like to thi
22  ents that they can actually strike up a bargain with a patient. Em and things ca
23   occurred to me that I might be able to bargain with him. If you really are a Ke
24  es."    But you're not. All you have to bargain with now is a copy of the decode
25  added.    The Americans are prepared to bargain with the Russians on almost anyt
26  ers from their beds each day at five to bargain with the    wholesalers, which g
```

As well as illustrating a range of prepositions that follow *bargain*, the concordance lines also give a rich insight into how the word collocates with other words (see below and chapter 2), for example, *to strike a bargain*, or *bargain hunters*. We also find idiomatic usage, such as *into the bargain* meaning 'as well'.

On the question of corpus size, in the case of *bargain*, we had to search over 10 million words of data to find a range of instances. This is because it is not a core vocabulary item in English. If, on the other hand, we were looking at a word or structure that was quite common, a smaller corpus would suffice. Aston (1997), Maia (1997) and Tribble (1997) suggest using a small corpus if we are dealing with a very specialised language register, for words of caution, see Gavioli (2002) (see also chapter 8 which makes a case for using small corpora to look at relational language). In terms of what constitutes a large or a small corpus, it depends on whether it is a spoken or written corpus and what it is seeking to represent. For corpora of spoken language, anything over a million words is considered to be large; for written corpora, anything below five million is quite small. In terms of suitability, however, it is often the design of a corpus as opposed to its size which is the determining factor. For example, a corpus containing only highly technical engineering language will be largely inappropriate for language teacher trainees wanting to investigate general vocabulary. Therefore, while size is an issue, it should be considered hand-in-hand with the appropriateness of corpus design (for further discussion of these and other issues relating to size and corpus design see: Sinclair 1991a; Thomas and Short 1996; Aston 1997; Maia 1997; Tribble 1997; Biber et al. 1998; McCarthy 1998; Biber et al. 1999; Coxhead 2000; Carter and McCarthy 2001; Hunston 2002; O'Keeffe and Farr 2003; Thompson 2005a; Wynne 2005a; Adolphs 2006 and McEnery et al. 2006).

Overview of existing corpora

There are many corpora available and some can be bought, some are free and some are not publicly available (e.g. corpora compiled by publishers for the specific commercial purposes of producing language teaching resources and materials, or corpora where the consent agreement of writers or speakers may only allow for restricted use). Appendix 1 provides an overview of a wide range of language corpora and how to find out more about them. Throughout this book we will be referring to a number of these corpora in our illustrations and analyses.

1.4 How to make a basic corpus

A basic language corpus can be assembled from spoken or written texts and can be used with commercially available corpus software such as *Wordsmith Tools* (Scott 1999) and *Monoconc Pro* (2000), which any average home computer user can manipulate with relative ease. A spoken corpus takes considerably longer to build, as discussed above, because speech has to be transcribed and possibly coded for some of its non-verbal features. Written corpora, on the other hand, can be made very quickly using the internet as a source (though international copyright must always be respected in the usual ways).

Stages of building a spoken corpus

1 *Create a design rationale*

Your corpus will need some design principle (see above on representativeness). When considering the design of a spoken (or written corpus), considerations of feasibility (what is available, what is ethical, what is legal?) will need to be a guiding factor also. Decide what it is you wish to represent and consider how best you can represent this for your purposes. This will guide your decision as to how much data you want to collect. For example, you might wish to create a corpus of news reports to use in class. You could decide to collect ten news reports or a hundred. You may wish to only record business reports or political reports and so on.

2 *Record data*

It is useful to keep in mind that one hour of continuous everyday, informal conversation yields approximately 12,000 to 15,000 words. The mode of recording is also worth consideration. There are a number of options including analogue cassettes, digital media and audiovisual digital recorders. Traditional analogue, though they are inexpensive, have a number of drawbacks. They are cumbersome to store and unlike digital recordings, they cannot easily be computerised and aligned with the transcription later. Using digital devices leaves open the option of aligning sound (and image if you use an audiovisual recorder) with your transcription. Permission to record should be cleared in advance with the speakers and consent forms should be signed off authorising the use of the recordings for research or commercial pedagogical materials, etc. It may be necessary to specify how the recordings will be used when obtaining permission; for example, is the speaker signing permission just for the transcript to be used, or for his/her actual voice to be used in research or any publication?

3 Transcribe recordings and save as text files

Spoken data needs to be manually transcribed and this is what makes corpora of spoken language such a challenge. They are best stored as 'plain text' files, as this offers the maximum flexibility of use with different software suites. As mentioned above, every one hour of recorded speech can take approximately two working days to transcribe. In most cases, every word, vocalisation, truncation, hesitation, overlap, and so on, is transcribed, as opposed to a cleaned-up version of what the speakers said. The level of detail of the transcription is relative to the purpose of your corpus. If you have no requirement to know where overlapping utterances and interruptions occur, then there is no point in spending time transcribing to that level of detail. Figure 3 shows an example of an extract from a transcript from the Limerick Corpus of Irish English (LCIE) (see appendix 1). Our data extracts in this book will use these conventions to a greater or lesser extent:

TRANSCRIPTION CODING KEY

<$1>, <$2>, etc.	these mark the different speakers in the order in which they appear on the recording
+	interruptions can be marked from where they occur and from where the utterance is resumed (often called 'latched turns')
=	unfinished or truncated words can be marked, for example, yester=
<?>	unintelligible utterance
<$E> laugh <\$E>	extralinguistic information such as 'laughing', 'sound of someone leaving the room', 'coughing', 'dog barking' can be useful background information

Figure 3: Extract of a transcript of a recording of family members changing a printer cartridge while looking at the instruction manual (from LCIE)

```
<$1> Oki Jet. Isn't that what we have?

<$2> Yeah but that's not the <$E> pause one second <\$E> there's a <?>. Here it is.
     Here Brendan. Here. Look. <$E> intercom goes off in the kitchen <\$E>

<$1> Knock that off now. <$E> sound of intercom being switched off <\$E>

<$2> There's about six different languages.

<$1> So what's the problem?

<$2> We needed to replace the print head.

<$1> Oh right.

<$2> So that's the problem. <$E> noise of printer in background <\$E>

<$3> <$E> shouting from another room <\$E> Hello.

<$2> <$E> looking at printer manual <\$E> Changing the ink cartridge <?>

<$3> <$E> from the other room <\$E> Change the+

<$1> Changing the ink cartridge yeah. What does it say abou=

<$2> Open the printer cover.

<$1> All right.

<$2> <$E> reading from the instruction manual <\$E> The print head carriage will move
      automatically to the head loading replacement position of the empty print head.

<$1> Right.

<$2> <$E> reading from the instruction manual <\$E> Release only the ink cartridge
      from the print head casing pulling gently outwards the lateral+

<$1> Press the green button first Brian

<$2> That's the black one. No that's fine. If you put that back in+

<$1> There's no print head on it.
```

4 *Database texts*

Transcription files need to be organised so that source information can be traced. For example, it may be useful to be able to retrieve information such as gender, age, number of speakers, place of birth, occupation, level of education, where the recording took place, relationship of speakers and so on. This information can be stored at the beginning of each transcript as an information 'header' (see Reppen and Simpson 2002: 98–99), or in a separate database, where the information is logged with the file name.

5 *Check transcription*

Finally, the transcription needs to be checked with the original recording for accuracy.

Stages of building a written corpus

1 ***Create a design rationale***

As discussed above, start with a design rationale. Decide what it is you want to represent and how many texts you need to do this, from how many sources and over what period.

2 ***Input texts***

Depending on what form they are in, written texts may need to be re-typed or scanned. They may already be in electronic format or may be downloadable from the internet, and may have special copyright restrictions on their use. Once they are in electronic form, they need ideally to be saved as 'plain text' files; once again, this will offer the maximum flexibility of use with different software suites.

3 ***Database texts***

Any individual text in a corpus needs to be traceable to its source information (that is, who wrote it, where and when it was published, genre, number of words and so on, especially for purposes of subsequent use in relation to copyright). As discussed above, this can be stored at the beginning of each file (as 'header information') or in a separate database.

1.5 Basic corpus linguistic techniques

Here we overview some of the basic techniques that can be used on a corpus, using standard software such as *Wordsmith Tools* (Scott 1999) and *Monoconc Pro* (2000). Applications of these techniques will be illustrated throughout the book.

Concordancing

Concordancing is a core tool in corpus linguistics and it simply means using corpus software to find every occurrence of a particular word or phrase. This idea is not a new one and many scholars over the years have manually concordanced the Christian Bible, for example, painstakingly finding and recording every example of certain words. With a computer, we can now search millions of words in seconds. The search word or phrase is often referred to as the 'node' and concordance lines are usually presented with the node word/phrase in the centre of the line with seven or eight words presented at either side. These are known as Key-Word-In-Context displays (or KWIC concordances). Concordance lines are usually scanned vertically at first glance, that is, looked at up or down the central pattern, along the line of the node word or phrase. Initially, this may be disconcerting because we are accustomed, in Western cultures, to reading from left to right. Concordance lines challenge us to read in an entirely new way, vertically, or even from the centre outwards in both directions. Here are some sample lines from a concordance of the word *way* using the Limerick Corpus of Irish English (LCIE):

Figure 4: Concordance lines for *way* from LCIE

```
 ether in northern Ireland is no different in a way then em what they were desperately
     you see it?  Some of you anyhow?  Now in a way 'What Dreams may come' it's not
     subject to study in college in fact it's a way of life and you find this right
      and how could he present things in such a way that he would persuade people.
ul and the purpose of life is to live in such a way that when you die your soul is
t he was obviously he obviously lived a certain way of live and they wanted to know
  lem that they had to deal with in a different way they couldn't deal with it by
asically in football stadium that's the easiest way to describe it. There is a large
sking for you ok I find this the most effective way.  Ok now today em you have as well
speculative because there is no evidence either way.  You can't have evidence about
 e theologian starts from the top and works his way down.  The theologian will have
 rts from the ground so it speaks and works its way up.  The theologian starts from
```

Most software allows the number of words at either side of the node word or phrase to be adjusted to allow more of the context to be viewed and you can usually go back very easily and quickly to the source file containing the full text or transcript. Software normally facilitates the sorting of the concordance lines so that we can examine the lexico-grammatical patterns which occur before and/or after the node word. When sample concordance lines for *way* are sorted alphabetically to the left of the screen for example the following patterns emerge:

Figure 5: Sample concordance lines for *way* from LCIE, sorted to the left of the screen

```
 ether in northern Ireland is no different in a way then em what they were desperately
     you see it?  Some of you anyhow?  Now in a way 'What Dreams may come' it's not
     subject to study in college in fact it's a way of life and you find this right
      and how could he present things in such a way that he would persuade people.
ul and the purpose of life is to live in such a way that when you die your soul is
t he was obviously he obviously lived a certain way of live and they wanted to know
  lem that they had to deal with in a different way they couldn't deal with it by
asically in football stadium that's the easiest way to describe it.  There is a large
sking for you ok I find this the most effective way.  Ok now today em you have as well
speculative because there is no evidence either way.  You can't have evidence about
 e theologian starts from the top and works his way down.  The theologian will have
 rts from the ground so it speaks and works its way up.  The theologian starts from
```

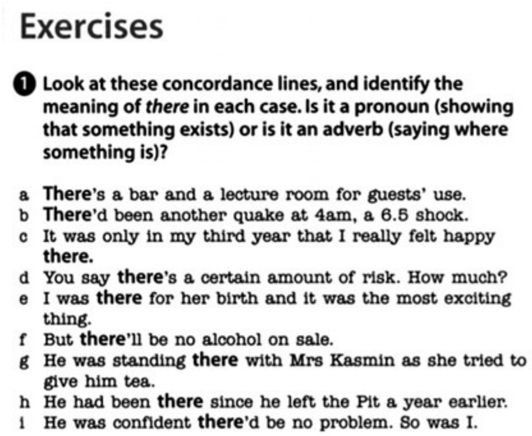
Another random sample from the concordance lines of the word *way*, sorted to the right of the screen, shows a systematic pattern with *from*:

Figure 6: Sample concordance lines for *way* from LCIE, sorted to the right of the screen

```
 would acquire an unlimited right of way from Abattoir Road to our client's land along
h Hampton magistrates ah just up the way from ah from the Silverstone circuit am the
And then there's one over across the way from Centra.        Oh right.         And
ah oh yeah.         +to come all the way from Frank's house do you know. So it's a
ead here      laughing       all the way from here all the way to the back myself and
    there's a bad test it's a bad go way from it don't bother with it cause it's this
ntion a request that came in all the way from Sweden it it it's sort a it has put a
day and John said he drove the whole way from the top lights to the bottom traffic
                   sobbing the whole way from the church to the hotel sobbing
 third last.      Now there's a long way from the third last isn't there to the
h.         Yeah then you can go that way from there as well.         Can we?
```

Because concordance lines can provide many examples of patterns of use, they have application to the language classroom and are now being used in ELT materials. For example, here is an extract from the entry on *there* in *Natural Grammar* (Thornbury 2004: 155), where concordance lines have been adapted for an inductive grammar task:

Figure 7: Extract from *Natural Grammar* (Thornbury 2004: 155)



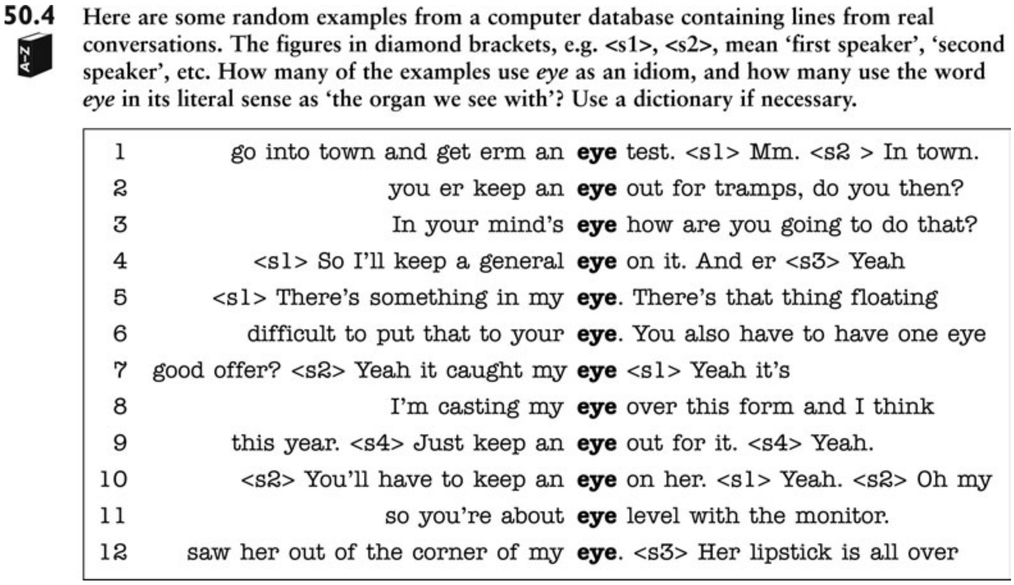
Exercises

1 Look at these concordance lines, and identify the meaning of *there* in each case. Is it a pronoun (showing that something exists) or is it an adverb (saying where something is)?

a **There**'s a bar and a lecture room for guests' use.
b **There**'d been another quake at 4am, a 6.5 shock.
c It was only in my third year that I really felt happy **there.**
d You say **there**'s a certain amount of risk. How much?
e I was **there** for her birth and it was the most exciting thing.
f But **there**'ll be no alcohol on sale.
g He was standing **there** with Mrs Kasmin as she tried to give him tea.
h He had been **there** since he left the Pit a year earlier.
i He was confident **there**'d be no problem. So was I.

Another example is found in McCarthy and O'Dell (2002), where students are invited to look at an extract from a concordance for the word *eye* and to decide which of the occurrences are idiomatic/metaphorical.

Figure 8: Extract from *English Idioms in Use* (McCarthy and O'Dell 2002: 109)



50.4 Here are some random examples from a computer database containing lines from real conversations. The figures in diamond brackets, e.g. <s1>, <s2>, mean 'first speaker', 'second speaker', etc. How many of the examples use *eye* as an idiom, and how many use the word *eye* in its literal sense as 'the organ we see with'? Use a dictionary if necessary.

1	go into town and get erm an	**eye**	test. <s1> Mm. <s2 > In town.
2	you er keep an	**eye**	out for tramps, do you then?
3	In your mind's	**eye**	how are you going to do that?
4	<s1> So I'll keep a general	**eye**	on it. And er <s3> Yeah
5	<s1> There's something in my	**eye**.	There's that thing floating
6	difficult to put that to your	**eye**.	You also have to have one eye
7	good offer? <s2> Yeah it caught my	**eye**	<s1> Yeah it's
8	I'm casting my	**eye**	over this form and I think
9	this year. <s4> Just keep an	**eye**	out for it. <s4> Yeah.
10	<s2> You'll have to keep an	**eye**	on her. <s1> Yeah. <s2> Oh my
11	so you're about	**eye**	level with the monitor.
12	saw her out of the corner of my	**eye**.	<s3> Her lipstick is all over