We cannot begin to evaluate someone's reasoning if we do not understand it, or if we understand the words but fail to grasp that reasons are being offered for accepting a point of view. The skills upon which this chapter focuses – recognising reasoning, and identifying conclusions, reasons and assumptions – are the most basic abilities, upon them the important skills involved in evaluating reasoning (the focus of our next chapter) depend.

**RECOGNISING REASONING AND IDENTIFYING CONCLUSIONS**

Reasoning is, of course, presented in language, but not all communications in language involve reasoning, so we need to be able to pick out those features of language which tell us that reasoning is taking place. It is clear that we use language for a variety of purposes. For example, we may use it to tell a joke, to insult someone, to report factual information, to describe a scene or a personality, to tell a story, to express our feelings, to explain why we have acted in a particular way, to ask questions, to issue orders. What most uses of language have in common is the attempt to communicate something to others.

Sometimes we want to persuade others to accept the truth of a statement, and one way of doing this is to offer them reasons or evidence in support of this statement. This is the essence of argument. The simplest examples of arguments occur when someone who believes some statement will present reasons which aim at persuading others to adopt this same point of view. In more complex cases, someone may wish to assess and evaluate someone else's reasoning, or someone may be reasoning about their own or someone else's reasoning. We all use language in this way, often without thinking of what we are doing as being something as grand as 'presenting an argument'. For example, someone might say:

He must be older than he says he is. He told us he was forty-two, but he has a daughter who is at least thirty years old.

Here reasons are being offered for the conclusion that 'he must be older than he says he is'. So this simple, everyday piece of communication is an argument.

Here are some more very simple examples of argument. As you read through these examples, think about which statement the author is trying to get you to accept (that is, the conclusion), and which statements are being offered as reasons for accepting the conclusion:

The bus is late. It must have broken down.

That bird can’t be a robin. It doesn’t have a red breast.

You should try to appear confident in your job interview. The employers are looking for someone who can speak confidently in public.

Children learn languages much more quickly and speak them more fluently if they start to learn them at an early age. So if you want your children to be bilingual, you should speak two languages to them from the time they are born.

She didn’t turn up for their date. She obviously doesn’t really want to be his girlfriend. If she’d wanted a serious relationship with him she wouldn’t have missed the date.

‘Argument indicator’ words

The language of reasoning can be very complex, but there are some relatively simple linguistic clues which can signal that reasoning is taking place. Certain characteristic words are used to indicate that someone is presenting a conclusion, the most commonly used being ‘therefore’ and ‘so’. For example, the argument presented in the first paragraph of this section could be written as:

He told us he was forty-two, but he has a daughter who is at least thirty years old.

So, he must be older than he says he is.

‘Hence’ and ‘thus’ can also function in the same way as ‘so’ and ‘therefore’, though they are less commonly used. Other words may indicate the presence of a conclusion, for example, ‘must’, ‘cannot’. In the original version above, the word ‘must’ is used to show that the reasons offered force us to draw the conclusion. The word ‘cannot’ could function in a similar way, since the conclusion could have been expressed as follows: ‘He cannot be as young as he says he is’. Sometimes the word ‘should’ can signal that someone is presenting a conclusion, because arguments often make a recommendation. This is shown in two of the examples above; the third, which recommends appearing confident in a job interview, and the fourth, which recommends speaking two languages to babies. All of these ‘conclusion indicator’ words have other uses in addition to their function in arguments, so their presence in a written passage does not guarantee that an argument is being offered. However, they are useful indicators in assessing whether a passage contains an argument.
Recognising arguments without argument indicator words

Some passages which contain arguments have no argument indicator words. In order to recognise them as arguments, it is necessary to consider the relationships between the statements in the passage, to assess whether some of the statements can be taken to support a statement expressing a conclusion. For example, the following passage can be construed as an argument:

Knowing the dangers of smoking is not sufficient to stop people from smoking. One-third of the population still smokes. Everyone must know that smoking causes lung cancer and heart disease.

This passage is clearly presenting as a statistical fact that one-third of the population smokes, and as an obvious truth that everyone must know the dangers of smoking. It is using these reasons to support the conclusion that knowing the dangers is not sufficient to stop smokers from smoking.

Note that the only candidate for a conclusion indicator – the word ‘must’ – appears not in the conclusion, but in one of the reasons. Yet, we can be clear that the last sentence is not the conclusion, because no appropriate evidence (for example, that there have been programmes to educate the public about the dangers) is offered. Note also that in this example, as well as in our first example, the conclusion does not appear at the end of the paragraph. We need to be aware that conclusions can appear anywhere within a passage, even though it is possible for us to ‘tidy up’ an argument by writing out the reasons first and ending with a conclusion introduced by ‘so’ or ‘therefore’.

We have now considered two things we might look for to identify the conclusion of an argument:

- conclusion indicator words;
- the claim for which reasons appear to be offered.

Note that if we have identified a conclusion, we have also identified the passage as an argument or as something which is intended to be an argument. If we have identified the conclusion by finding conclusion indicator words, then it is reasonable to regard the author as intending to present an argument. Earlier, we introduced the term ‘argument’ as one way in which people use language when they are attempting to persuade or convince others of the truth of something – that is to say, when they have a particular purpose. However, when trying to assess whether a written passage presents an argument, we are not solely trying to guess the purpose of the author in writing the passage. We can also attempt to interpret the way in which this piece of language functions: this is what we are doing when we identify the conclusion by the second method, that is to say by looking for the claim for which reasons appear to be offered. If a passage can be written out as a series of reasons supporting a conclusion, then it can be construed as an argument, even if the author did not quite intend it in that way.

Nevertheless, it is often useful as a first step to consider the purpose of a passage when trying to decide whether it is an argument. If you ask yourself, ‘What is the main point which this passage is trying to get me to accept or believe?’, you can then underline the sentence which you think expresses the main point. The next step is to check whether the rest of the passage contains a reason or series of reasons which support the main point. You do not need to worry too much at this stage about whether they give conclusive support, because you are not yet attempting to evaluate the reasoning. Consider whether they are relevant to the main point, and whether they support it, rather than count against it. Do they provide the kind of evidence or reasoning which one would need to present in order to establish the truth of the main point? If you are satisfied on these matters, then you can take it that you have identified a conclusion of an argument, and thereby decided that the passage is an argument. You may find it useful to tidy up the argument by writing it out as a series of reasons, followed by your chosen conclusion, introduced by ‘so’ or ‘therefore’.

Identifying conclusions

In this section are some examples in which we put these recommendations into practice.

The new miracle drug Amotril has caused unforeseen side effects of a devastating nature. Careful testing of the drug prior to its marketing could have prevented the problems caused by these side effects. Therefore, no new drugs should be released for public consumption without a thorough study of their side effects.

(Law School Admission Test, 1981)

This argument presents its conclusion in a straightforward way, and this helps to make it an easy passage to analyse. We first notice that the word ‘Therefore’ introduces the last sentence, so it is obvious that the conclusion we are being led to accept is:

no new drugs should be released for public consumption without a thorough study of their side effects.

The reason given for this is that careful testing of Amotril before it went on sale could have prevented the problems caused by its devastating side effects. In this case, we do not need to tidy up the argument, since it is clear what claim is being made. Moreover, the reason gives good support for the conclusion, provided we assume that one could not find out about a drug’s side effects without thorough study, and that it is never worth taking the risk of offering a drug for sale unless we are as certain as we can be that it has no serious side effects.

Here is another example:

People who diet lose weight. Falstaff cannot have dieted. He hasn’t lost weight.
In this case, we do not have a conclusion indicator such as ‘so’ or ‘therefore’, but we do have the word ‘cannot’. Is it being used to signal a conclusion? We must consider whether the sentence in which it occurs is the main point which the passage is trying to establish. It seems that the passage is trying to convince us that Falstaff cannot have dieted, and we seem to have a clear argument if we rearrange it to read:

People who diet lose weight. Falstaff hasn’t lost weight. Therefore, he cannot have dieted.

This is the most natural way to read the passage.

But suppose we had started out by assuming that the main point which the passage was aiming to get us to accept was that Falstaff has not lost weight. Then, we would have set out the argument as follows:

People who diet lose weight. Falstaff cannot have dieted. Therefore, he hasn’t lost weight.

But this is an unnatural reading of the passage, in two respects. First, it would not be natural to use the words ‘cannot have dieted’ in the second sentence if the meaning it aimed to convey was that Falstaff has been unable to diet. Second, even if we replaced ‘cannot have dieted’ with ‘has been unable to diet’, the first two sentences would be insufficient to establish the conclusion, since Falstaff may have lost weight by some means other than dieting, for example by taking exercise. Moreover, the kind of evidence which one would have to use in order to establish that Falstaff had not lost weight would be evidence, not about whether or not he had dieted, but about what he weighed in the past compared with what he weighs now.

Here is another example in which there are no conclusion indicators such as ‘so’ and ‘therefore’:

We need to make rail travel more attractive to travellers. There are so many cars on the roads that the environment and human safety are under threat. Rail travel should be made cheaper. Everyone wants the roads to be less crowded, but they still want the convenience of being able to travel by road themselves. People will not abandon the car in favour of the train without some new incentive.

What is the main point which this piece of reasoning tries to get us to accept? Clearly it is concerned with suggesting a way of getting people to switch from using cars to using trains, on the grounds that it would be a good thing if people did make this switch. We could summarise the passage as follows:

Because the large numbers of cars on the roads are bad for the environment and human safety, and because people will not abandon the car in favour of the train without some new incentive, we need to make rail travel more attractive. So, rail travel should be made cheaper.

Notice that the word ‘should’ appears in the conclusion. This may have helped you to see which sentence was the conclusion. Now that we can see more clearly what the argument is, we may question whether it is a good argument. For example, is it the cost of rail travel which deters motorists from switching to using trains, or is it because rail travel is less convenient? Would reducing rail fares really make a difference? Are there any alternative measures which would better achieve the desired effect? Setting out the argument in this way can help us to see what questions we need to ask when we begin to evaluate arguments.

Judging whether a passage contains an argument

Sometimes the subject matter of a passage may make it appear at first sight that an argument is being presented when it is not. Consider these two passages, one of which can be construed as an argument, whereas the other cannot.

The number of crimes reported to the police is rising. The overall crime rate may not be rising. Traditionally, only a quarter of what most people regard as crime has been notified to the police.

Most crime is committed by those aged under 21. But most people aged under 21 are not criminals. Some people aged over 21 are persistent offenders.

Let us consider the first passage and ask what main point it is making. Does it try to convince us that the number of crimes reported to the police is rising? It presents no evidence for this, but simply presents it as a fact. Does it try to convince us that traditionally, only a quarter of what most people regard as crime has been notified to the police? Again, no evidence is offered for this. Does it offer evidence for the claim that crime is rising overall? Well, it gives us information which shows that this is a possibility. The fact that reported crime is rising may make us suspect that crime is rising overall. But when we are told that there has been a tendency for only a quarter of what is regarded as crime to be reported, we can see that if this tendency has changed in such a way that a greater fraction of what is perceived as crime is now reported, then the overall crime rate may not be rising after all. We can write this argument as follows:

Traditionally, only a quarter of what most people regard as crime has been notified to the police. So, although the number of crimes reported to the police is rising, the overall crime rate may not be rising.

Notice that the original version of this passage did not contain any of the ‘argument indicator’ words which we have listed, but it is nevertheless an argument.
Now let us look at the second passage. What does it aim to get us to believe? It presents three comments about statistics on crime, each of which, in a sense, it aims to get us to believe, since it asserts them as being true. However, it does not have a single major point to make, in the sense that none of the statements supports any of the others. You will see this if you try for yourself writing out the three possible ways of treating one of the statements as a conclusion. So this is a passage in which three pieces of information about the same subject-matter are not linked in any process of reasoning; but because of the kind of information presented, that is to say, because it refers to statistics, we may at first be tempted to think of it as an argument, because the use of statistics is a common move in argument. We need to be aware, then, that argument is not just a matter of presenting information — it is, rather, a matter of presenting a conclusion based on information or reasons.

Summary: Is it an argument?

1. Look for conclusion indicator words, e.g. ‘so’, ‘therefore’, ‘must’, ‘cannot’, ‘should’.
2. If there are no conclusion indicator words, look at each sentence in turn and ask, ‘Does the rest of this passage give any extra information which tells me why I should believe this?’ If the answer is ‘no’, then the sentence is not a conclusion.
3. If none of the sentences in a passage is a conclusion, then the passage is not an argument. No conclusion, no argument. If one of the sentences is a conclusion supported by reason(s) in the rest of the passage, then the passage is an argument.
4. When you have found a conclusion, rewrite the passage with the conclusion at the end, introduced by ‘So’. Read through the rewritten passage. If it makes sense, then you can be sure that it is an argument.

(Do not worry at this stage about whether the reasons are true or about whether they give conclusive support to the conclusion.)

Exercise 1: Identifying arguments and conclusions

For each of the following passages:

(a) decide whether it is an argument;
(b) if it is an argument, say what the conclusion is.

1. Pets are good for you. Research has shown that pet owners are less likely than other people to be depressed or to suffer from high blood pressure.
to ensure that such limits are enforced. But, because this would inconvenience the
majority who drive safely, this would be an unacceptable solution to the problem of
careless drivers who are unsafe at current speed limits.
13 In the Victorian era, cannabis was used to treat all kinds of conditions, such as muscle
spasms, menstrual cramps and rheumatism. Now its use, even for medicinal pur-
poses, is illegal. It has been found to be helpful in relieving the symptoms of multiple
sclerosis.
14 Training can improve one’s performance in sport, and advances in the technology of
sporting equipment can help athletes to break world records. But this does not mean
that the right training and the right equipment can help anyone to excel. Scientists
have identified genes that give some individuals an advantage in athletics, for example
a gene that helps the body to use oxygen efficiently, and thus helps the muscles to
work well for longer periods.
15 Some social historians have claimed that the 1914–18 war enhanced the status of
women in Britain, because they were able to leave demeaning jobs in domestic service
to work in munitions factories, thus gaining independence and a sense of self-worth.
However, the work in these factories was unskilled, repetitive and dangerous – not
at all the environment to encourage self-belief. And after the war, women workers
were told to give up their jobs to returning soldiers. Many simply returned to
domestic service. The reality was thus quite different from what some social
historians claim.

Answers to Exercise 1 are given on pp. 161–163

### IDENTIFYING REASONS

We use reasons in a number of ways, for example to support conclusions of arguments, to
support recommendations, to explain why something has happened, or why someone has
acted in a particular way. This section focuses on the use of reasons to support conclusions
of arguments.

If we have identified a conclusion of an argument which has no argument indicator words,
then it is likely that we will already have some idea as to why the reasons of the argument
are, since in order to identify the conclusion, we will have had to assess which parts of the
passage could be taken to give support to the chosen conclusion – hence which parts are
the reasons. This is what you were doing when you worked through Exercise 1. But if we
identify the conclusion by the presence of argument indicator words, then we will have to
look again at the passage in order to identify the reasons.

Sometimes we will find characteristic words which indicate the presence of reasons, e.g.
‘because’, ‘for’, ‘since’. For example, our earlier argument about Falstaff could have read as
follows:

People who diet lose weight. Since Falstaff hasn’t lost weight, he cannot have dieted.

In this example, the word ‘Since’ signals that ‘Falstaff hasn’t lost weight’ is being offered as
a reason for the conclusion that Falstaff cannot have dieted. Sometimes a phrase will be
used which tells us explicitly that a reason is being offered, a phrase such as ‘the reason for
this is’; and sometimes reasons are listed, introduced by the words ‘first . . . second . . . (and
so on)’.

Arguments often use hypothetical or conditional statements as reasons. These are state-
ments which begin with ‘If’ and which say that something is true, or will be true, or will
happen, provided that (on the condition that) something else is true or something else
occurs – for example, ‘If I read without wearing my glasses, I will get a headache’. When
you see a sentence beginning with the word ‘If’, think about whether this is being offered
as one of the reasons for a conclusion. It is important to remember that it is the whole
statement which is being presented as a reason. You should not attempt to break the
statement down into two reasons. Sometimes an argument has a hypothetical statement
for a conclusion, so you cannot just assume that any hypothetical statement is being
offered as a reason.

In common with ‘conclusion indicator’ words, these ‘reason indicator’ words can be used
in ways other than to introduce a reason, so their presence cannot guarantee that a reason
is being offered – but it can be a useful clue. Sometimes, however, we will find no such
words or phrases, and will have to rely on our understanding of the meaning of the passage.
It may be useful to ask yourself, ‘What kind of reason would I have to produce in order to
provide support for this conclusion?’ You should then look in the passage to see if such
reasons are offered.

In addition to the hypothetical statements already mentioned, many different kinds of
statements can function as reasons. They may be items of common knowledge, general
principles, reports of the results of experiments, statistics, and so on. What they have in
common is that they are put forward as being true. Not all the reasons offered in an
argument can be given support within that argument. That is to say, that arguments have
to start somewhere, so every argument must offer at least one basic reason for which no
support is offered. Thus those who present arguments will often take as a starting point
something which is obviously true, or the truth of which can easily be checked by others.
However, this is not always the case. People may present something which is contentious
as a basic reason, and they may fail to give support for such a statement precisely in order
to conceal the contentious nature of their argument. So the evaluation of reasoning, which
will be discussed in the next chapter, will require us to consider whether the basic reasons
presented in any argument are true.

### The structure of arguments

The reasons in an argument can fit together in a number of ways. Sometimes there may be
only one reason supporting a conclusion, for example:
Falstaff is thinner. So he has probably been dieting.

In our original Falstaff argument, there are two reasons:

Reason 1: People who diet lose weight.

Reason 2: Falstaff hasn't lost weight.

These two reasons, taken together, support the conclusion:

Falstaff cannot have dieted.

Neither reason on its own would be sufficient to support the conclusion. The number of reasons used in this way in an argument need not be limited to two. An argument could have three, four or a whole string of reasons which need to be taken together in order to support the conclusion.

However, sometimes when there are two (or more) reasons, they are offered not as jointly supporting the conclusion, but as independently supporting it, for example:

It is right to ban cigarette advertising because it encourages young people to start smoking. But even if it had no such influence on young people, it would be right to ban it because it could give existing smokers the mistaken impression that their habit is socially acceptable.

In this case, the conclusion that it is right to ban cigarette advertising could be supported either by the claim that it has the adverse effect of encouraging young people to start smoking, or by the claim that it has the adverse effect of making smokers think that their habit is socially acceptable. This differs from the Falstaff argument in that the author of this argument does not regard it as necessary to offer both reasons, and would claim that the argument had established its conclusion if either reason could be shown to be true. But when an argument offers reasons as jointly supporting the conclusion, then evaluating the argument requires an assessment of the truth of all the reasons.

In the two examples we have just presented, it is clear that in one case joint reasons, and in the other case independent reasons, are being offered. But in some arguments it will be debatable whether the reasons are intended to support the conclusion jointly or independently. Consider the following example:

Our 40,000 GIs stationed in South Korea support a corrupt regime. The savings in dollars which would result from their coming home could make a sizable dent in the projected federal deficit. Furthermore, the Korean conflict ended 30 years ago. Hence it is time we brought our troops home.

(James B. Freeman, *Thinking Logically*, p. 165)

In this case each one of the first three sentences presents a reason for the conclusion, which appears in the last sentence. Because they are all quite strong reasons for the claim that the troops should be brought home, it may be that the author regards them as independently supporting the conclusion. On the other hand, if they are taken jointly, they present a much stronger case for the conclusion. We could interpret the argument either way here, but it should be remembered in cases like this that, provided all the reasons are true, the argument could be judged to be stronger if it is regarded as presenting joint rather than independent reasons.

Arguments can become much more complicated than the above examples. Reasons may be offered for a conclusion which is then used, either on its own or together with one or more other reasons, in order to draw a further conclusion. It is useful to make a distinction in such cases between an *intermediate conclusion* and a *main conclusion*. Here is an example of an argument with an intermediate conclusion.

A majority of prospective parents would prefer to have sons rather than daughters. So, if people can choose the sex of their child, it is likely that eventually there will be many more males than females in the population. A preponderance of males in the population is likely to produce serious social problems. Therefore, we should discourage the use of techniques which enable people to choose the sex of their child.

The main conclusion here, signalled by ‘Therefore’, is that

we should discourage the use of techniques which enable people to choose the sex of their child.

The immediate reasons given (jointly) for this are:

if people can choose the sex of their child, it is likely that eventually there will be many more males than females in the population,

and

a preponderance of males in the population is likely to produce serious social problems.

The first of these two reasons is itself a conclusion, signalled by the word ‘So’, which follows from the basic reason.

A majority of prospective parents would prefer to have sons rather than daughters.

Thus an analysis of this passage reveals that the first sentence is a basic reason, which supports the *intermediate conclusion* expressed in the second sentence, which in turn, taken jointly with the additional reason offered in the third sentence, supports the *main con-
clusion in the last sentence. Unfortunately, not all arguments will set out their reasons and conclusions in this obvious order of progression, so you cannot simply take it for granted that basic reasons will always appear at the beginning, with intermediate conclusions in the middle and main conclusion at the end.

We have mentioned two important approaches to identifying the reasons which are being offered in an argument – first, asking what kind of reason could give support to a particular conclusion, and second, attempting to sort out the way in which the reasons in a passage hang together. It may seem that detailed knowledge of the subject matter will be necessary before one can begin to analyse the argument, and no doubt it is true that the more familiar you are with the subject matter, the more readily will you be able to work out the structure of the argument. However, on many topics, most people will be able to go a long way towards understanding arguments which they encounter in newspapers and textbooks, and they will improve at this task with the kind of practice afforded by the following sets of exercises.

Summary: Identifying reasons in an argument
1 Look for reason indicator words, i.e. words such as ‘because’, ‘for’, ‘since’ ‘if . . . then’.
2 Identify the conclusion and ask ‘What kind of reason would I have to produce in order to support this?’
3 Reasons may be items of common knowledge, general principles, reports of results from experiments, statistics, etc.
4 Reasons can be offered as jointly or as independently supporting the conclusion.
5 Some reasons also function as intermediate conclusions.

Exercise 2: Offering reasons for conclusions
Working with a partner, take it in turns to think of a simple claim which you think you have good reason to believe. (For example, you may think that there should be speed limits lower than 30 mph on all housing estates, because cars travelling at 30 mph on streets where children play can easily cause road deaths.) Tell your partner what your ‘conclusion’ is (in this example ‘Speed limits on housing estates should be lower than 30 mph’). Your partner must then try to offer a reason for this. They may not come up with your reason, but they may come up with another good reason. What you are practising in this exercise is thinking about the relevance and the strength of potential reasons. You may not come up with the strongest reason, but you should aim to produce something which is clearly relevant, and gives some support to the conclusion, rather than being neutral or counting against it.

Exercise 3: Identifying reasons
This exercise also gives you practice in assessing what could count as a reason for a given ‘conclusion’. In each question, pick the answer which could be a reason for the conclusion, and say why this is the right answer, and why the other options are wrong. Note that you are not to worry about whether the reason is true. You must just consider whether, if it were true, it would support the conclusion.

1 Conclusion: Blood donors should be paid for giving blood.
(a) The Blood Donor service is expensive to administer.
(b) People who give blood usually do so because they want to help others.
(c) There is a shortage of blood donors, and payment would encourage more people to become donors.

2 Conclusion: When choosing someone for a job, employers should base their decision on the applicants’ personalities, rather than on their skills.
(a) Personalities may change over time, and skills go out of date.
(b) Skills can easily be taught, but personalities are difficult to change.
(c) Some skills cannot be acquired by everyone, but everyone can develop a good personality.

3 Conclusion: Light-skinned people should avoid exposure to the sun.
(a) Ultra-violet light from the sun can cause skin cancer on light skins.
(b) Light-skinned people do not suffer as a result of exposure to the sun.
(c) Light-skinned people can use sun creams in order to avoid sunburn.

4 Conclusion: Installing insulation in your house may be economical in the long run.
(a) Less fuel is needed to heat a house which has been insulated.
(b) In a house which has been insulated the air feels warmer.
(c) Some types of insulation cause houses to be damp.

5 Conclusion: In order to reduce crime, we should not use imprisonment as a punishment for young offenders.
(a) Young offenders could be taught job skills whilst in prison.
(b) It would be expensive to build new prisons to relieve prison overcrowding.
(c) Young offenders are more likely to re-offend if their punishment has been a term of imprisonment.

6 Conclusion: Sam could not have committed the murder.
(a) Sally had both the opportunity and a motive to commit the murder.
(b) Sam could not have gained anything by committing the murder.
(c) Sam was several miles away from the scene of the murder when the victim was stabbed to death.

7 Conclusion: A vegetarian diet may be beneficial to health.
(a) A vegetarian diet lacks certain important vitamins.
(b) A vegetarian diet excludes animal fats which can cause heart disease.
(c) A vegetarian diet excludes fish oil which is thought to be beneficial to health.

8 Conclusion: Parents should be strongly advised to have their children vaccinated against polio.
(a) Some parents think that there is a risk of harmful side effects from the polio vaccine.
(b) If a substantial percentage of the population is not vaccinated against polio, there will be outbreaks of the disease every few years.
(c) The risk of becoming infected with polio is very low.

9 Conclusion: Those people who die from drowning are more likely to be swimmers than to be non-swimmers.
(a) People who cannot swim are much more likely than swimmers to avoid risky water sports.
(b) Many deaths from drowning occur because people on boating holidays fail to wear life-jackets.
(c) Even those who can swim may panic if they fall into the sea or a river.

10 Conclusion: Some types of chewing-gum are bad for the teeth.
(a) Some chewing-gums are sweetened with sorbitol, which helps to neutralise tooth-rotting acids.
(b) The action of chewing gum can get rid of particles of sugar trapped between the teeth.
(c) Some chewing-gums are sweetened with sugar, which causes tooth decay.

11 Conclusion: A worldwide epidemic amongst humans of the H5N1 strain of bird flu is unlikely to occur.
(a) People can catch the H5N1 strain of bird flu from contact with infected birds.
(b) The H5N1 strain of bird flu cannot be transmitted easily between people.
(c) Scientists are working on the development of a vaccine against the H5N1 strain of bird flu.

12 Conclusion: Studies of the effects of diet on health which rely on people reporting everything they have eaten may give inaccurate results.
(a) Some people in the study may not enjoy eating healthy foods.
(b) Some people in the study may not remember what they have eaten.
(c) Some people in the study may have been unhealthy when the study began.

13 Conclusion: If you want to save electricity, you should switch the light off whenever a room is unoccupied for however short a time.
(a) Turning a light on and off frequently has no damaging effect on the bulb.
(b) Using less electricity saves you money and reduces carbon emissions.
(c) Starting up a light requires very little electrical power.

14 Conclusion: Playing computer games can be beneficial for children.
(a) Children who play computer games are less interested in reading.
(b) The visual skills of children improve when they first start playing computer games.
(c) Watching television is no more educational for children than playing computer games.

15 Conclusion: The fall in the percentage of married couples who divorce in the UK is not evidence that the percentage of unloving marriages has fallen.
(a) The total number of marriages per year in the UK has been steadily falling.
(b) People who live together without marrying are more likely to split up than those who are married.
(c) Some couples remain married simply because divorce is regarded as too expensive.

Answers to Exercise 3 are given on pp. 164–167.

Exercise 4: Identifying parts of an argument

For each of the following arguments, identify the main conclusion and the reasons. Say whether there are any intermediate conclusions. Say whether the reasons are intended to support the conclusion jointly or independently.

1 There’s no good reason to object to paying for admission to museums and art galleries. After all, you have to pay to go to the theatre or to listen to a concert.
2 A study by psychiatrists at the Royal Free Hospital in London compared treatments for two groups of about seventy patients suffering from depression. In one group, patients were given twelve sessions of psychotherapy; in the other, they were given routine care from their general practitioner. They all improved significantly over the next nine months, and there were no differences between the two groups in the rate and extent of improvement. Psychotherapy is thus no more effective than chatting with your GP.

3 The ban on smoking in public places in the UK is likely to be accepted without much protest. In Spain and Italy, countries in which the percentage of smokers is higher than in the UK, there have been no major problems arising from a similar ban.

4 Testing drugs on animals cannot give us the information we need in order to assess safety for humans, because animals are too different from humans. The evidence for this is that some drugs which appeared safe in animal tests have been harmful to humans, and that aspirin and penicillin are poisonous to cats.

5 The birth rate in European countries is declining very fast. This means that even though people are living longer, eventually the size of the population will fall, and there will be fewer and fewer people of working age to sustain an ageing population. Either it will be necessary to raise the retirement age, or younger people will have to increase their productivity at work.

6 The introduction of tests on drivers for drugs such as cannabis is being considered, and it has been suggested that a zero limit may be set. The result would be that someone with even a small amount of cannabis in the bloodstream could be prosecuted. This would be unfair because some people whose driving was not impaired could be prosecuted, since cannabis can remain in the bloodstream for up to four months. So if drug tests are introduced, the limit should not be set at zero.

7 It is clear that global warming is occurring, but we cannot be confident that it is caused by the burning of fossil fuels which produce high levels of carbon dioxide. The earth has experienced warmer climates and higher levels of carbon dioxide in previous ages, long before the current high level of fuel use.

8 Smoking related illnesses don’t really cost the state as much as is often claimed. If no one smoked, the revenue from taxes would be massively reduced, and many smokers will die before collecting their full share of health and retirement benefits.

9 Transplanting animal organs into humans should not be allowed. These transplants are expensive to perform, and the risk of animal diseases being transmitted to humans cannot be ruled out. It should be possible to solve the shortfall of organs available for transplant by persuading more people to carry organ donor cards. A human organ must give a human being a better chance of survival.

10 If killing an animal infringes its rights, then never may we destroy, for our convenience, some of a litter of puppies, or open a score of oysters when nineteen would have sufficed, or light a candle in a summer evening for mere pleasure, lest some hapless moth should rush to an untimely end. Nay, we must not even take a walk, with the certainty of crushing many an insect in our path, unless for really important business! Surely all this is childish. In the absolute hopelessness of drawing a line anywhere, I conclude that man has an absolute right to inflict death on animals, without assigning any reason, provided that it be a painless death, but that any infliction of pain needs its special justification.


11 The number of people likely to die as a result of eating infected meat during the epidemic of BSE (‘mad cow disease’) in the late 1980s is much lower than originally expected. First predictions were that thousands would die over the following 50 years. If this had been an accurate estimate, many more than the 129 cases so far reported in Britain would have occurred by now.

12 Environmentalists who are concerned about the likelihood of extinction of many animal and plant species suggest that protected areas should be introduced world-wide. But in some poor countries this would prevent people using the only natural resource available to them. Economic aid should be given to such countries, in addition to setting up protected areas, because without such aid the poor would be paying the price of conservation, rather than the international community.

13 It is sometimes said that men are better than women at navigating. The evidence for this is that men are better at mentally rotating maps, and can solve mazes faster. However, the claim that this makes men the best navigators is too simplistic. Women are much better than men at remembering landmarks, an important skill in finding one’s way around a new area.

14 It is ludicrous to claim that Wikipedia, the so-called ‘encyclopaedia’ of the Internet, is a reliable source of knowledge in the same way that encyclopaedias are. Unlike entries in an encyclopaedia, the entries in Wikipedia can be written by anyone, regardless of whether the author has any expertise in the subject.

15 Road traffic continues to increase. Building new roads or widening existing roads simply encourages more traffic. Motorists will change their habits only if there is some financial disincentive to using the car. The solution to traffic congestion is to introduce charges for road use.

Answers to Exercise 4 are given on pp 168–173.

Exercise 5: Thinking about assumptions

Here is a slightly longer passage of reasoning taken from an article in a newspaper, discussing whether Bill Clinton, who was the President of the United States from 1992 until 2000, should be criticised for his alleged sexual involvements with women other than his wife. The article was written some years before Clinton’s liaison with Monica Lewinsky – an affair to which he eventually admitted, after having lied on oath about it. The following points may make it easier to understand the passage:
recognise the assumptions upon which an argument relies. We have discussed the two most basic components of arguments – reasons and conclusions – but our understanding of arguments will not be complete unless we can recognise the assumptions upon which an argument relies.

• The author uses the word ‘syllogism’ in the second sentence, but it is used inaccurately. A syllogism is a particular form of argument. What the author describes as a syllogism is simply a hypothetical statement.
• In the first paragraph the author refers to Richard Nixon, a former President of the United States, and says that ‘the American people could not be sure where he was during the day’. This is a reference to the widespread perception of Nixon as being an untrustworthy politician. His nickname was ‘Tricky Dickie’.

Now read the passage, say what you think is its main conclusion, and write down a list of assumptions which you think it makes.

Two justifications are generally given for the examination of a politician’s sex life. The first is the prissy syllogism that ‘if a man would cheat on his wife, he would cheat on his country’. But John F. Kennedy and Jimmy Carter were, by most accounts, strong husbands but weak Presidents. I would guess that Pat Nixon knew where Dick was every night. The problem was that the American people could not be sure where he was during the day. Conversely, it is a sad but obvious fact that, to many of those men to whom he gave unusual political nous, God handed out too much testosterone as well.

The second excuse for prurience towards rulers is that leaders, tacitly or explicitly, set examples to the nation and thus their own slips from grace are hypocritical. But Bill Clinton, unlike many senior US politicians, has never publicly claimed that he has led an entirely decent life.

And if the US does wish to impose strict standards of sexual morality on its leaders, then it must properly address the Kennedy paradox. A month ago in Dallas, I watched people weep and cross themselves at the minute of the 30th anniversary of JFK’s assassination. If only he had lived, they said then, and millions of middle-aged Americans say it daily. They construct a cult of stolen greatness. But if JFK had lived, he would have been trashed weekly by bimbo anecdotes in the supermarket magazines. If he had run for President in the Eighties, he wouldn’t have got beyond New Hampshire before the first high-heel fell on television.

So we must tell the snipers not to fire at Bill Clinton (because of his sex life).

(Mark Lawson, The Independent, 30 December 1993, adapted)

IDENTIFYING ASSUMPTIONS

Defining ‘assumption’

In order to clarify what is meant by the word ‘assumption’ in the context of reasoning, let us first consider what we might mean in everyday conversation by talking about ‘assuming’ something. Suppose you tell me that you are going to the post office before lunch, and I say, ‘Take the car, because it will take you too long to walk’. You might reply, ‘You’re assuming it will take me too long to walk, but you’re wrong’. Here you would be referring to something which I have just stated, and telling me that I was mistaken. Hence, everyday usage of the term ‘assumption’ can imply that an assumption is something which is explicitly asserted, but is not, or may not be, true. One connotation of ‘assumption’, as people normally use the word, is of a belief that we hold in the absence of strong evidence for its truth – that is to say that the term may mark a distinction between what is known and what is merely believed.

If we interpret the term ‘assumption’ in this way, we might think that ‘assumption’ can refer to reasons and conclusions of arguments – that is, to things which have been stated but which may or may not be true. However, those concerned with argument analysis typically make a distinction between reasons, conclusions and assumptions in an argument, and we shall be accepting this distinction here. Moreover, our use of the word will not imply a distinction between what is known and what is merely believed.

For the purpose of our discussion of assumptions in reasoning, we shall use the word ‘assumption’ to mean something which is taken for granted, but not stated – something which is implicit rather than explicit. It is the fact that an assumption is unstated which distinguishes it from a reason. There may, or may not, be strong evidence for the truth of an assumption in an argument, and this is a characteristic which it has in common with a reason.

Sometimes in the process of evaluating arguments, the term presupposition is used instead of assumption. We prefer the term assumption, because of the possibility of confusion between ‘presupposing’ and ‘supposing’. Usually when arguments tell us to ‘suppose that x is true’, they are neither stating nor assuming that x is true; they are merely exploring what would follow from the truth of x, and often they are doing this precisely in order to show that x must be false. So we must not take the presence of the word ‘suppose’ in an argument to indicate that an assumption is being made. Indeed, since we are using the term ‘assumption’ to denote something which is not stated, there are no special words in arguments which are used to indicate the presence of this kind of assumption.

In the sense of ‘assumption’ set out above, arguments have many assumptions. For each argument we encounter, there will be a whole host of shared background information – for example, the meanings of the words in which the argument is expressed, and general knowledge which gives support to the reasons which are presented. Sometimes these assumptions will be so uncontentious that we will not be interested in making them explicit. Sometimes, however, we will suspect that an argument rests upon a dubious assumption, and it will be important for us to express exactly what that assumption is in order to assess the argument.
We shall say more later about assumptions concerning the meanings of words, assumptions about analogous or comparable situations, and assumptions concerning the appropriateness of a given explanation. But for this chapter, we shall focus on the following two important ways in which assumptions function in an argument: first, in giving support to the basic reasons presented in the argument; second, as a missing step within the argument — perhaps as an additional reason which must be added to the stated reasons in order for the conclusion to be established, or perhaps as an intermediate conclusion which is supported by the reasons, and in turn supports the main conclusion. Let us explore these two uses of assumptions by looking at some examples.

Assumptions underlying basic reasons

The following argument (used in a slightly different form on p. 27 as an example of an argument without a conclusion indicator word) provides an example of the use of an assumption in the first sense, that is to say as something which is intended to support one of the basic reasons of the argument.

One-third of the population still smokes. Everyone must know that smoking causes lung cancer and heart disease. So, knowing the dangers of smoking is not sufficient to stop people from smoking.

This piece of reasoning presents two (basic) reasons for its conclusion:

**Reason 1**: One-third of the population still smokes.

**Reason 2**: Everyone must know that smoking causes lung cancer and heart disease.

In such arguments, the basic reasons may be well-established facts, or they may make the kind of factual claim which we could easily check. Reason 1 seems to be of this nature — that is to say that either it is a generally accepted fact, backed up by reliable statistics, or the author of the argument has made an error about the statistics, and the fraction of the population who smoke is something other than one-third. But we do not need to worry about the reasonableness or unreasonableness of assumptions in relation to Reason 1, because we would be able to seek confirmation as to the correct figure, and in any case, the exact figure is not crucial to establishing the conclusion. Provided that some of the population still smoke — and our own experience confirms the truth of this — and provided Reason 2 is true, then Reason 1, taken together with Reason 2, gives support to the conclusion.

Reason 2, however, seems a less straightforward factual claim than Reason 1. What lends support to this statement? The claim that ‘everyone must know . . .’ suggests that there is an underlying reason for expecting people to be well-informed on this topic, and the obvious candidate is that there has been widespread publicity on the dangers to health of smoking — on television, in newspapers and by means of posters in the waiting rooms of doctors and hospitals. Yet, the move from the doubtless true claim that there has been publicity about the dangers to the further claim — that everyone must know about the dangers — depends upon an assumption that everyone has absorbed this information, is capable of understanding the messages which are being put across, and accepts the truth of those messages.

This may seem a reasonable assumption to make, but there may well be those who would wish to challenge it by pointing out that, despite publicity campaigns, some people may not believe that there is a causal link between smoking and ill-health, because they think that the statistics are inconclusive. Even if you do not regard this assumption as controversial, the example illustrates the way in which we can attempt to identify potentially controversial assumptions underlying the basic reasons presented in an argument. Clearly the identification of such assumptions is closely associated with evaluating the truth of reasons, which will be discussed further in the next chapter.

Another example of assumptions which underlie basic reasons is provided by the passage below:

Occupational accidents will never be eliminated because all human activity entails risk. But the total number of accidents could be greatly reduced, and the surest way of achieving such a reduction is to penalise, with fines or even imprisonment, those employers on whose premises they occur. Such a policy might result in cases of individual injustice, but it would be effective in securing safer workplaces.

Before reading on, ask yourself what this passage is recommending, and why.

The passage is recommending the imposition of penalties on employers on whose premises occupational accidents occur, on the grounds that this would be the best way to reduce the number of such accidents. There is an obvious unstated assumption here that the threat of penalties would influence the behaviour of employers. But there is a further assumption, since the existence of penalties would not reduce the number of accidents if it were beyond the power of employers to prevent some of the accidents which now occur. So the argument assumes that it is possible for employers to take measures which will prevent the occurrence of some accidents.

Both these assumptions function as reasons which need to be taken together in order to support the claim that the threat of penalties would reduce accidents; and both are reasonable assumptions to make. However, even with these assumptions, the conclusion is too strong, since nothing has yet been said to support the idea that introducing penalties is the surest way of achieving a reduction in accidents. So there is yet another assumption — that no other method would be as effective in reducing the number of accidents — and this assumption is more controversial than the others, since it may be possible to get employers to take appropriate action by offering them incentives.
Assumptions as unstated reasons or conclusions

The second type of assumption is one which is needed to fill a gap within the argument, either as an additional reason, without which the reasons which are offered do not fully support the conclusion, or as a missing link between the reasons and the conclusion. Here is an example of an argument which illustrates the former:

In tests designed to investigate the effect of a time delay on recalling a list of words, subjects remembered fewer words after a 30-second delay than after a 10-second delay. Therefore, after a 60-second delay, we would expect subjects to remember even fewer words than after a 30-second delay.

Before going on, ask yourself what is being assumed. Write down any assumption you can identify.

The argument gives just one reason for its conclusion that subjects can be expected to remember fewer words after a 60-second delay than after a 30-second delay. The reason is the piece of evidence that fewer words are remembered after 30 seconds than after 10 seconds. But this piece of evidence supports the conclusion only if it is true that the ability to recall goes on declining after a 30-second delay. So the argument is relying on this assumption in order to draw its conclusion. If we did not make this assumption explicit, we might happily accept the conclusion as obviously following from the evidence. Even when the assumption has been identified, we may consider it a reasonable assumption to make. Nevertheless, it is possible that subjects would be able to remember just as many words after 60 seconds as after 30 seconds, perhaps because the number of words still retained in the memory was a manageable number for the memory to hold. Self-respecting psychologists would not be prepared to draw a firm conclusion without carrying out an appropriate further test.

Here is another example in which one of the reasons has been left unstated:

When cigarette advertising is banned, cigarette manufacturers save the money they would otherwise have spent on advertising. Thus, in order to compete with each other, they reduce the price of cigarettes. So, banning cigarette advertising leads to an increase in smoking.

Before reading further, think about the reasoning in this passage. What conclusion is it trying to get us to accept? What basic reason does it offer? Is there an intermediate conclusion? Can you identify a stage in the argument which has not been stated?

The argument starts with a basic reason:

When cigarette advertising is banned, cigarette manufacturers save the money they would otherwise have spent on advertising.

Thus, in order to compete with each other, they reduce the price of cigarettes.

It then draws the main conclusion:

So, banning cigarette advertising leads to an increase in smoking.

The main conclusion would not follow from the intermediate conclusion if a reduction in the price of cigarettes made no difference to the numbers of cigarettes bought and smoked. So an assumption underlies this move — that when cigarettes are cheaper, smokers smoke more, or non-smokers become smokers. The conclusion does not say exactly what it means by ‘an increase in smoking’, so we cannot be sure whether the assumption is:

When cigarettes are cheaper, smokers smoke more,

or

When cigarettes are cheaper, more people smoke,

or perhaps both of these. However, it clearly requires at least one of these assumptions in order to support the conclusion, and perhaps both assumptions are questionable. This is a case of an assumption which, taken together with an intermediate conclusion, gives support to the main conclusion of the argument.

In some pieces of reasoning, an intermediate conclusion may be left unstated. Imagine the following report being made by a policeman to his superior officer about a theft from an art gallery.

The burglar must have left by the fire escape. This person is not in the building now, but has not been seen leaving the building, and there are guards posted at each entrance.

What intermediate conclusion is the policeman drawing which he has not actually stated? Is this a reasonable conclusion to draw?

The policeman gives three reasons which, taken together, are intended to support the conclusion that the burglar must have left by the fire escape:

Reason 1: This person is not in the building now

supports the claim that the burglar must have left the building. But

Reason 2: (the person) has not been seen leaving, and

Reason 3: there are guards posted at each entrance
example of advertising demonstrates that some things shown on television affect behaviour. In that case, in drawing its conclusion, it relies on the wholly implausible assumption that if some things which are shown on television affect behaviour, then violence shown on television must be one of those things.

The discovery that this argument does not give strong support to its conclusion does not establish that its conclusion is false. Perhaps violence shown on television does affect viewers’ behaviour, but, if this is so, it is a truth which cannot be established by means of this particular argument. The ability to identify the mistakes in other people’s reasoning is a valuable skill which will be discussed in more detail in the next chapter.

The examples discussed above have been of specific assumptions relating to the subject matter of particular arguments. There are some assumptions which form the whole context in which an argument is presented, but which may not be made explicit, so that someone unfamiliar with the context will find it more difficult to understand the argument. Consider the following passage:

It has been claimed that powdered rhinoceros horn has aphrodisiac properties, but scientists investigating its effects have been unable to find any chemical effect on the human nervous system. Also, an experiment was carried out in which 100 people ate powdered rhinoceros horn, and another 100 people ate powdered rice, without knowing what they were eating. Very many more of those who ate the rice reported feeling an increase in sexual arousal than did those who ate the rhinoceros horn. This demonstrates that rhinoceros horn probably does not have aphrodisiac properties.

In describing the experiment, and making the claim about what it demonstrates, this argument does not bother to state that powdered rice is not an aphrodisiac. But we can understand that this is being taken for granted, if we reason as follows:

If rhinoceros horn has aphrodisiac properties, then more people should report an increase in sexual arousal after eating rhinoceros horn than after eating powdered rice, which we know does not have aphrodisiac properties. But this did not happen in the experiment. So rhinoceros horn does not have aphrodisiac properties.

Someone familiar with the way in which such experiments are carried out — the use of a control group of people with which to compare those on whom the rhinoceros horn is tested, the attempt to eliminate irrelevant psychological effects by keeping subjects ignorant of which substance they are eating — will readily understand why the conclusion is being drawn, and will see that there is an unstated assumption that powdered rice is not an aphrodisiac.

Someone unfamiliar with the context of experiments may find it more difficult to understand what is going on. They may, of course, notice that nothing is said about the aphrodisiac properties of powdered rice, and they may reason as follows:

There are two possible interpretations of the passage, each of which rests on a dubious assumption. It may be suggesting that because television advertising affects viewers’ behaviour, everything shown on television, including depictions of violence, must affect behaviour. In that case, the dubious assumption is that if one aspect of television output affects behaviour, all aspects must. Alternatively, it may be suggesting that the
Powdered rice either does or does not have aphrodisiac properties. If it does, then the experiment cannot tell us whether rhinoceros horn has no aphrodisiac properties or merely weaker aphrodisiac properties than does powdered rice. If it does not, then the experiment does indicate that rhinoceros horn does not have aphrodisiac properties, because if it did have such properties, the number of those reporting an increase in sexual arousal should have been higher amongst those who ate rhinoceros horn than amongst those who ate powdered rice.

However, this is a complex piece of reasoning, and, rather than hitting upon this, readers of the argument might instead imagine a context in which it is not known by the experimenters whether either substance has aphrodisiac properties. They might then conclude that the experiment appeared to indicate that both substances have aphrodisiac properties, although the powdered rice had much stronger aphrodisiac properties than the rhinoceros horn. So they might regard the conclusion of the argument as mistaken, even though, provided one assumes that powdered rice is not an aphrodisiac, it is a reasonable conclusion to draw from the evidence.

This is an example, then, of an argument with a specific unstated assumption, which it will be more difficult to identify if one is unfamiliar with the context – the whole set of background assumptions – in which the argument is set. This indicates the value of understanding certain contexts of arguments, and that it is valuable to ask certain questions about any argument which cites experimental evidence – for example, what is the purpose of any comparison which is being made between different groups of people, what differing conclusions could be drawn on the basis of one set of assumptions as opposed to a conflicting set of assumptions?

We have said little here about assumptions as to the meanings of words and phrases used in reasoning, but we shall discuss this in greater detail in Chapter 5. The following exercises will enable you to practise the skill of identifying assumptions.

**Summary: Identifying assumptions in an argument**

1. In Critical Thinking, an assumption of an argument is something that has not been stated, but upon which the argument depends.
2. Within an argument, an assumption can function as a basic reason, as an additional reason or as an intermediate conclusion.
3. Assumptions in an argument may or may not be true.

**Exercise 6: Identifying someone else’s assumptions**

Sometimes we may find it more difficult to identify the assumptions underlying our own reasoning than to identify the assumptions upon which others are relying. This exercise aims to make you more aware that there may be unstated beliefs in your own reasoning which others would wish to challenge. Suppose, for example, you were to say that the police force should devote more of their time to patrolling on foot in rural areas and suburbs, and, as your reason for believing this, you said that crime has increased in these areas. Someone may point out to you that you are assuming that the presence of policemen on the streets and country lanes can deter potential criminals from committing crimes.

Work with a partner for this exercise. From the following list, choose a statement with which you agree, and give your partner just one reason why you believe this. Your partner must then try to identify any unstated assumptions upon which your view depends.

1. The ban on smoking in public places is a good thing.
2. Boxing is a barbaric activity.
3. Fox hunting should not have been made illegal.
4. Coarse fishing is a pointless pastime.
5. The older one gets, the wiser one becomes.
6. Newly qualified drivers should not be allowed to drive on motorways.
7. The pattern of family life has changed in recent years.
8. Schools should be required to provide sex education.
9. Too many new motorways are being built.
10. It was a good idea to set up the National Lottery.

You can continue this exercise choosing your own topics. Choose something which is of general interest, but about which you know people tend to disagree.

**Exercise 7: Identifying assumptions in arguments**

For each of the following passages, identify any unstated assumptions, and say whether they are assumptions which underlie a basic reason, or assumptions which function as an additional reason, or assumptions which function as an intermediate conclusion.

1. Men are generally better than women at what psychologists call ‘target-directed motor skills’, but what the rest of us call ‘playing darts’. Many people would say that this is not due to innate biological differences in the brain, but is due to the fact that upbringing gives boys more opportunities to practise these skills. But there must be some innate difference, because even three-year-old boys are better than girls of the same age at target skills.
2. Allowing parents to choose the sex of their children could have serious social costs. There would be a higher percentage of males who were unable to find a female partner. Also, since it is true that 90 per cent of violent crimes are committed by men, the number of violent crimes would rise.
3. When people live in a house for a long period of time, they develop a strong commitment to the local neighbourhood. So a fall in house prices may have a
beneficial effect. The middle classes will become enthusiastic campaigners for better schools, and against vandalism, traffic congestion and noisy neighbours.

4 If the money has been stolen, someone must have disabled the alarm system, because the alarm easily wakes me if it goes off. So the culprit must be a member of the security firm which installed the alarm.

5 The campaign to eradicate measles has been so successful that many doctors have never seen an actual case. Ironically, this puts those few people who do contract the disease in greater danger than they would have been before. The disease can cause serious complications, and it is difficult to diagnose without previous experience because the symptoms are similar to those of several other diseases.

(Law School Admission Test, December 1984)

6 There is a much higher incidence of heart attack and death from heart disease among heavy cigarette smokers than among people who do not smoke. It has been thought that nicotine was responsible for the development of atherosclerotic disease in smokers. It now seems that the real culprit is carbon monoxide. In experiments, animals exposed to carbon monoxide for several months show changes in the arterial walls that are indistinguishable from atherosclerosis.

(Law School Admission Test, March 1985)

7 Patients on the point of death, who either died shortly afterwards or were revived, have often reported visions of places of exquisite beauty, intense feelings of peace and joy, and encounters with loved ones who had predeceased them. These experiences clearly suggest that there is life after death. Skeptics often claim that such phenomena are caused by changes in the brain that precede death, because these phenomena resemble certain altered states of consciousness that can be induced by drugs or organic brain disease. This objection fails, however, because most of the patients whose experiences of this nature have been reported were neither drugged nor suffering from brain disease.

(Law School Admission Test, October 1985)

8 The growth in the urban population of the US has put increasing pressure on farmers to produce more food. Farmers have responded by adopting labour saving technology that has resulted in a further displacement of population to cities. As a result, the farm population, formerly a dominant pressure group in national politics, has lost political power.

(Law School Admission Test, February 1983)

9 Human beings have the power either to preserve or to destroy wild plant species. Most of the wonder drugs of the past fifty years have come from wild plants. If those plants had not existed, medicine could not have progressed as it has, and many human lives would have been lost. It is therefore important for the future of medicine that we should preserve wild plant species.

10 Thirty years ago the numbers of British people taking holidays in foreign countries were very small compared with the large numbers of them travelling abroad for holidays now. Foreign travel is, and always has been, expensive. So British people must on average have more money to spend now than they did thirty years ago.

11 Athletes should not be banned from taking performance enhancing drugs. Since they are allowed to improve their performance through training and coaching, we are already a long way from rewarding winners simply on the basis of their natural talent. If these drugs really do improve performance, and if athletes were allowed to take them, then everyone would improve by the same amount. Thus no-one would have an unfair advantage as a result of taking drugs.

12 The number of students who get good results in GCSE science examinations is in decline. To respond to this by making examination questions easier is a big mistake, because one consequence would be that science teaching in schools would demand much less intellectual effort from students. If we want to keep Britain at the forefront of scientific and technological achievement, we must not weaken the scientific culture of the country.

13 It is clear from the latest figures on women in the work force that women are still being prevented from getting top jobs due to prejudice against them. Although women make up 45 per cent of the national work force, and 30 per cent of its managers, they are barely represented in the very top jobs in law, the police and business.

14 In a recent study of 210 adults, psychologists assessed the personalities of the subjects by means of personality tests, and also asked them to list the number of sexual contacts they had had. The results showed that those who had been judged ‘socially cold’ had listed more sexual partners than those with other types of personality. Thus it is evident that people who are socially cold prefer to have a large number of superficial sexual relationships rather than an emotionally demanding sexual relationship with just one person.

15 Instead of being locked up, people who commit murder when they are in a psychotic state should be treated with drugs to change their condition. When in a psychotic state, they have no control over their own actions. So punishing them is not appropriate because it cannot make them change their behaviour. Thus locking them up in prisons or secure units is pointless.

Answers to Exercise 7 are given on pp. 174–180.

Exercise 8: Re-working Exercise 5

Read again the passage for Exercise 5 (p. 23). Identify its conclusion, reasons and unstated assumptions. Compare the list which you originally wrote for Exercise 5 with the unstated assumptions which you have now identified.

Answers to Exercise 8 are given on pp. 180–183.