CRITICAL THINKING

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Your Essential Guide

ONE

UNDERSTANDING THE REASONS BEHIND THINGS

Why does reasoning matter (and how can you spot an argument)?

↓

How do you spell out the reasoning behind an argument?

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How do you draw out a logical conclusion from your premises?

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How do you draw out a probable conclusion from your premises?

↓

How can you select and test the best explanation of something?

↓

How should you assess evidence and plan your reading strategy?

DON'T RAISE YOUR VOICE, IMPROVE YOUR ARGUMENT.

DESMOND TUTU

#TalkCriticalThinking

FIVE THINGS YOU'LL LEARN IN THIS CHAPTER

1   The significance of *reasoning* in work and research
2   How to identify *arguments* and their *conclusions*
3   How to create *clear descriptions*, *summaries* and *examples*
4   How to tell the difference between *arguments* and *explanations*
5   How to distinguish between *better* and *worse explanations*

We have defined critical thinking as the opposite of uncritical thinking. Rather than automatically believing what you read or are told, it entails pausing and carefully evaluating what is really going on. When we think critically, we are searching for the best account we can currently offer of the way things actually are. This involves two related questions:

• **Why** we should accept something as true, and…
• …**How** things came to be the way they are.

Another way of putting this is that we are interested in identifying and making good arguments, coming up with reasonable explanations – and rejecting bad examples of both.

Critical-thinking books often place a great deal of emphasis on arguments, and we'll explore why in this chapter, but they are far from the whole story. We also need to be able to think critically about other kinds of communication and expression – and to be especially alert to the kind of reasoning that lies behind explanations, theories and the scientific method of investigation.

WHAT IS AN ARGUMENT? PERSUASION THROUGH REASONING

Why does reasoning matter so much? To answer this, let's first look at something different: assertions. Here is an **assertion** about keeping animals as pets:

> It is wrong to keep animals as pets.

Assertion: a statement of fact or belief, provided without support or justification

An assertion is a statement of fact or belief, provided without support or justification. It's also something that, on its own, does little other than impart information.

By contrast, an argument does something more useful. Consider this line of argument about keeping animals as pets:

> It is wrong to keep animals as pets, because this means they are not free and cannot lead dignified lives. All living creatures deserve the dignity of freedom.

Now, we are looking not only at a claim about the way things are, but also at a line of reasoning seeking to justify this claim. This attempt to provide reasonable justification for a particular

conclusion is important. When someone asserts that 'it is wrong to keep animals as pets', we have no way of knowing why they think this. They might have an amazingly convincing reason that would change our lives if we heard it. They might simply be saying it because their mother used to say it. We don't know. As soon as they make an argument, however, we can start to do all kinds of interesting things. We can:

- gain a fuller understanding of their view of the situation
- work out whether or not we agree with their reasoning
- compare different arguments to see whether something else is more convincing
- investigate to see whether they have ignored important information or ideas
- debate with them and attempt to change their minds – or change our own.

Argument: an attempt to persuade someone through reasoning that they should agree with a particular conclusion

When someone makes an argument, they are attempting to persuade you that you should accept a particular conclusion – and they are doing so by presenting one or more connected propositions that (they claim) support it. Here, then, is a working definition of an argument in critical thinking: an **argument** is an attempt to persuade you of the truth of a particular conclusion using reasoning.

We can break this down into two key elements:

- You are presented with a line of reasoning that…
- …seeks to convince you to accept a particular conclusion.

Conclusion: the final point that someone making an argument is trying to convince you of; the final proposition in any argument, supported by its premises

The **conclusion** of an argument is its final point: the point that everything else leads towards. One argument's conclusion can be the starting point of another; but each argument only has one final conclusion.

Below are three different ways in which I might talk to you about a job you are looking to fill. Only one of them is an argument in the sense I've just described: presenting both a conclusion and a line of reasoning. Try to identify which one:

		Yes	No
1	Hi! My name is Tom, and I'm the right man for this job!	◯	◯
2	I'm the right person for the job. I'm the best qualified and I'm available now..	◯	◯
3	I have plenty of work experience from around the world; I'm a great worker...	◯	◯

Let's go through them in order, seeing whether they have both reasoning and a conclusion:

1   This definitely has a conclusion – 'I'm the right man for this job!' – but no reasoning is provided to support it. I may have provided a cheerful introduction, but I haven't offered any reasons in support of my conclusion: I have simply asserted it.

2   This has both reasoning and a conclusion: it may sound informal, but it still counts as an argument. The first sentence provides our conclusion – 'I'm the right person for the job'; while the second sentence provides two reasons supporting it – 'I'm the best qualified' and 'I'm available now'.

3   This presents what you might think of as a line of reasoning – 'I have plenty of work experience' – but there is no explicit attempt to link it to a conclusion, or indeed to persuade you. I'm simply making an assertion about my experience and abilities.

Note that, if this third example came in the context of a general conversation about jobs, you might decide that my implicit conclusion is so evident that my words *do* count as an argument. If, for example, you had just said 'I really need a new employee with global experience' and I instantly replied 'I have plenty of work experience from around the world', then the conclusion I wanted to convince you of would be obvious enough for this to qualify as an argument. What does and doesn't count as a line of argument is, in other words, heavily dependent upon its context. It takes practice to identify when a line of reasoning is being assumed in everyday speech – and when it's worth making this reasoning explicit in order to analyse it.

For each of the examples below, try to identify whether an argument is being made or not. If one is, try to explicitly spell out what reasoning and conclusion are being presented:

	Yes	No
1 Come on in, the water's lovely!	◯	◯
2 Beware of the dog: he's angry and might bite your hand.	◯	◯
3 You wouldn't want to meet my brother when he has a hangover.	◯	◯

Although (1) sounds informal – 'come on in, the water's lovely!' – it does qualify as an argument once we spell it out. It's an effort to persuade you of the conclusion that you should come into the water, using the reasoning that the water is lovely. As to whether you find this convincing – you may want to dip a toe in to test the temperature before diving in.

Example (2) also contains an argument. It's an effort to persuade you of the conclusion that you should beware of the dog, using the reasoning that he is angry and might bite you. Again, the informality of the tone means we need to paraphrase things to be clear about what is going on.

Finally, example (3) is not an argument, although it sounds similar to one: 'You wouldn't want to meet my brother when he has a hangover.' Taken on its own terms, this statement simply entails my telling you some information about my brother that you may choose to believe, or not.

If, however, I had said 'my brother has a hangover, you should just ignore him because he's bound to be in a bad mood' – or if this meaning was clear from the wider context of our conversation – it would count as an argument. I would be trying to persuade you of a conclusion (that you should ignore my brother) using reasoning (that he has a hangover and is bound to be in a bad mood).

SPOTTING ARGUMENTS BY SEARCHING FOR A CONCLUSION

Searching for a conclusion: when you're trying to work out whether someone is making an argument, begin by seeing if there is a particular conclusion they want to convince you of

You may have noticed that, in each of the examples above, I began analysing all of them by **searching for a conclusion**. This may sound like doing things backwards, but – as we will explore in more detail in the next chapter – this is often the most useful way to begin when trying to work out whether you are dealing with an argument.

Look at the three passages below and try using conclusion-spotting as a technique to help you determine whether they are arguments or not.

	Yes	No
1 You should definitely let me look after your cat while you're on holiday. I love cats. And cats love me. I have lots of cats at home and know how to look after them. I have 12 cats, and I talk to them all the time. I'm a real cat expert.	○	○
2 For a surprisingly large number of clinical trials, scientists cannot reproduce the original result when a study is repeated. This suggests that something may be seriously wrong with the system of peer review and publication around clinical trials.	○	○
3 I have a large number of friends who work in the finance industry: horrid people, insecure profession. But we do go out for some excellent dinners.	○	○

Example (1) is an argument. Here, the conclusion comes in the first sentence: 'you should definitely let me look after your cat while you're on holiday.' The rest of the paragraph then provides some reasoning as to why you should accept this conclusion – the fact that I love cats, have lots of cats and know how to look after them – alongside some less relevant (and frankly alarming) information about my cat-related habits.

Example (2) is also an argument. The first sentence sets out a line of reasoning around the fact that scientists cannot repeat the results of some clinical trials. The second sentence presents a conclusion supported by this line of reasoning – that something may be wrong with peer review and publication. Spotting the conclusion allows us to work backwards and see that the first sentence comes before it, and that an argument is being made.

Example (3) is not an argument. The ideas presented do not fit in any particular order, and one is not the conclusion of a line of thought suggested by another. It may very well be the case that I have what I believe to be good reasons for concluding that finance is an 'insecure profession' – but in this case it is simply asserted, without any reasoning in support of it.

In real life, you will be dealing with longer and more confusing arguments than these examples – making it useful, as in the case of reasoning, to bear in mind a number of indicator words that point towards a conclusion. There is no firm rule about using indicator words, and sometimes there will not be any. Often, however, a final conclusion will either be indicated by words like 'because' and 'since' or will appear prominently at either the start or end of a piece of writing.

Now try reading the following passage. Does it contain an argument, complete with reasoning and a conclusion? If so, see if you can spot any indicator words that show where each is to be found:

> Expenditure on early childhood education varies greatly from country to country. By some measures, the UK spends more than any other country on this first educational stage – but then drops behind when it comes to primary and secondary education. Given that there is a lack of direct evidence around the impact of spending on educational outcomes, and that evidence-based policymaking is especially important in the educational space, detailed comparative research into the impact of spending on attainment at each level across different countries would thus make a valuable topic for rigorous investigation.

Close reading is vital for teasing out the key points being made here. As the phrase 'given that' indicates, the main reasoning of this argument is that 'there is a notable lack of direct evidence around the impact of spending on educational outcomes' and that 'evidence-based policymaking is especially important in the educational space' – while, as the word 'thus' indicates, its conclusion is that 'detailed comparative research into the impact of spending on attainment at each level across different countries would thus make a valuable topic for rigorous investigation'.

Non-argument:
any element of a piece of writing that does not attempt to persuade you of a conclusion through reasoning, and thus doesn't qualify as part of an argument

Did you come up with the same analysis as me? If not, don't worry. Arguments aren't always easy to spot – and doing so means paying as much attention to what *isn't* an argument as to what *is* one. In the following sections, we're going to look at several key types of **non-arguments**: types of writing that do not count as arguments, because they don't involve trying to persuade you of a conclusion through reasoning.

....**SMART STUDY 1.1**

Spotting the words that indicate conclusions and reasoning

Certain words and phrases often indicate where an argument's reasoning and its conclusion are. When trying to identify a line of reasoning, look for phrases such as 'given that', 'based upon', 'considering', 'since', 'because' and other words that mobilize information in support of an idea rather than simply presenting it as fact. When trying to spot a conclusion, look for indicator words and phrases like 'thus', 'therefore', 'and so', 'overall' and 'which shows that'.

....

WHAT ISN'T AN ARGUMENT? INFORMATION WITHOUT REASONING

We've said that an argument means using reasoning to support a particular conclusion. If this is not taking place, something other than an argument is being presented.

When we are presented with information but no explicit reasoning, the crucial question is how far we believe this information to be **accurate** and **relevant** to the particular topic we are engaging with. This section explores four different types of information that we commonly find in writing and speech:

* descriptions
* summaries
* opinions and beliefs
* clarifications and illustrations.

Descriptions

Consider the following statements. Are any of them arguments?

		Yes	No
1	According to the World Health Organization, the world's leading cause of death is coronary heart disease.	○	○
2	My grandfather died of coronary heart disease at the age of 90.	○	○
3	Coronary heart disease affects more men than women.	○	○

ANY HUMAN POWER CAN BE RESISTED AND CHANGED BY HUMAN BEINGS.

URSULA K. LE GUIN

#TALK CRITICAL THINKING

Description: simply reporting information without any attempt at evaluating, commenting on or using the information to persuade

As you probably guessed, none of the statements above is an argument. Instead, they are **descriptions**: they report information about something, but they don't perform any kind of reasoning – and nor do they explicitly pass judgement on or analyse the information they contain.

You might think that saying 'coronary heart disease affects more men than women' does include some kind of reasoning or evaluation. But even this simply provides descriptive information: I am not telling you what I think; I am simply passing on information.

A good **description**, at least in an academic context, aims to provide clear information without introducing any evaluation, reasoning or persuasion: its purpose is to convey relevant information as clearly and neutrally as possible. Compare the following two descriptions.

Which is better?

1   A lot of people in our experiment found it difficult to work out what was going on.   ◯

2   Eight out of the ten subjects in our experiment found the instructions they were given sufficiently unclear that they failed to perform the task correctly.   ◯

Both of the sentences above describe the same thing, but it's clear that the second sentence is a better description than the first. It is more detailed, more precise and clearer: it offers a more useful record of what happened. Paying close attention and writing detailed, useful descriptions is quite an art – not least because it means deciding what is worth paying attention to in the first place.

In the example above, it is useful to know that eight out of ten people found the instructions they were given unclear. It would be even more useful to know exactly what each of them found unclear within the instructions. It would probably not, however, be useful to know what colour clothes they were each wearing, or how tall they were. In any situation, there are an almost infinite number of things we could choose to describe – and so the question of what it is most relevant to include and exclude is of the utmost importance.

When reading or writing a description yourself, try to bear these questions in mind:

* What was the person writing this description in a position to know?
* What within this description is useful or relevant to what I want to know?
* What other details have been left out that might be useful or important?
* Is the description precise and clear, or is it vague, unclear or exaggerated?

Summaries

Here's an extended example of a particular kind of description often used in academic work and research:

The experiment entailed dividing 100 volunteers into two groups of 50. The groups were selected at random in advance and allocated to two different rooms in which they would sit an identical test. Half an hour was allowed for completing the test, which consisted of 30 multiple-choice questions based on correctly identifying the next symbol in a sequence. The first group was permitted, before sitting the test, to eat as many freshly baked cookies as they wished from five trays placed in the room. The second group had identical trays of cookies placed in their room, but were told that they could not eat until they had finished. Overall, those who were allowed to eat immediately averaged 75 per cent correct results in the test compared to 55 per cent among those who were not allowed to eat until the end.

This passage is a **summary**, in this case of a fictional experiment (based very loosely on a real psychological experiment conducted by Baumeister, Bratslavsky, Muraven and Tice at Case Western Reserve University in 1998).[4] Like any description, it conveys information without offering analysis or reasoning; but the particular point of writing a summary is to concisely cover all the main points in an area.

Summary: a brief outline of key information, often setting out the main points covered in a longer piece of work

Being able to write (and to identify) good summaries and descriptions is an important skill – and one that requires plenty of reasoned engagement, even if this reasoning isn't explicitly spelled out. Why? Because it entails engaging critically with several complex questions. What is and isn't relevant? What can and can't be stated clearly and definitively? What does it mean to ensure you don't introduce biases, arguments, opinions and other extraneous materials where they do not belong? Compare the summary above to this very different account of the same scenario:

The experiment entailed dividing 100 volunteers into two groups of 50 that we ended up thinking of as the 'greedy' and the 'hungry' groups. Each group was forced to sit an identical and extremely boring test. I'm not sure all of them understood it, and am worried that the results might be invalid given how many of them seemed to crash the system or get stuck and not bother finishing. Anyway, the first group ate lots of cookies which we had put on a table while the others didn't, and it was amazing what a difference this made; being hungry is clearly bad for the brain, although actually the best performer was in the 'hungry' group. Then again, I think they cheated and stole a cookie or two before the time was up.

This is a pretty poor summary of an experiment compared to the first version (although I will admit that it's a livelier read). It's confused and confusing in terms of structure. It doesn't tell us everything we need to know to get a clear picture of what happened. It mixes things like opinion and evaluation in with the description ('being hungry is clearly bad for the brain'). And it contains irrelevant details, like speculation about whether one person stole cookies, while missing out key information – such as what the overall results were.

Ultimately, a **good summary** carefully and clearly sets out relevant information – and covers all the key points as briefly as possible, while introducing nothing that is irrelevant or confusing. When reading or writing a summary, ask yourself:

- What is the purpose of this summary?
- What are the key points needed to understand what is going on?
- Is there any irrelevant detail that can be left out – or some essential information that needs to be added – in order to make this as concise and clear as possible?

Opinions and beliefs

If I express an opinion or a belief, then I am describing something nobody else has access to: my own personal feelings about the status of something. I may or may not possess strong reasons – or be aware of strong evidence – for holding a particular opinion. But if I say, for example, 'Italians make the best ice cream in the world!' then I am expressing a personal position that goes beyond any evidence I could possess.

To express an **opinion** or a **belief** is to present a personal point of view. Opinions tend to be personal judgements about particular topics, while beliefs tend to be convictions based on morality, faith or cultural context

Opinions and beliefs range from the trivial to the profound. I may have strong opinions about politics and sport, or about morality and architecture. I may believe in some things deeply, while being unsure or prepared to change my mind about others. In general, the word 'beliefs' tends to describe something people are convinced is true or fundamental, while 'opinions' tend to be more loosely held or entail more everyday topics. But both terms can be used interchangeably; and both ultimately express judgements or preferences that go beyond objective reasons and evidences. In other words, they describe a subjective aspect of one particular person's worldview – or the shared worldview of a group – which may conflict with others' views in ways that no amount of external evidence can resolve.

Consider these three statements. Each one, in its own way, presents either an **opinion**/**belief** or a more neutral piece of description. See if you can tell which is which:

		Opinion	Description
1	Governments are morally obliged to lead the fight against heart disease.	◯	◯
2	In her recent speech, the Prime Minister declared that governments are morally obliged to lead the fight against heart disease.	◯	◯
3	Your diet is awful: you ought to stop eating so much bacon!	◯	◯

The first example doesn't contain the words 'I think that', but it's clear that saying 'governments are morally obliged to lead the fight against heart disease' is not simply a neutral description of something the speaker has noticed. It's not like saying 'there is a lot of heart

disease in the world': it presents a particular individual's view about the way things ought to be, and thus expresses an opinion/belief.

The second statement, by contrast, doesn't convey a personal belief on the part of the speaker. Instead, it's a description of a belief expressed by the prime minister – and should thus be evaluated on the basis of how accurately and clearly it does, or doesn't, convey the gist of this speech.

The last of my three examples is an opinion directly addressed to someone else, saying what I think they ought to do – 'your diet is awful: you ought to stop eating so much bacon!' We can classify this as a piece of **advice** or a **warning**: a special kind of opinion that describes not only someone's point of view, but also their point of view about what ought to be done.

Advice and **warnings**: opinions about what someone should, or should not, do

In the real world, we spend much of our time dealing with beliefs and opinions – and expressing our own. We only tend to offer reasoning for our point of view occasionally; and even when we do, we are often not so much trying to persuade someone else that we are correct, as seeking to explain why we did or believe something. Indeed, most acts of reasoning ultimately involve certain beliefs about what is important or irrelevant, better or worse, right or wrong, fair or unfair, and so on. And as we'll explore later in this book, being 'reasonable' is more about acknowledging and analysing such beliefs than about pretending there's such a thing as perfect impartiality. When encountering an opinion or a belief, ask yourself:

- Why might someone hold this belief – and how far do you think they're reasonable to do so?
- What effect is holding such a belief or opinion likely to have?
- What different opinions or beliefs is it possible to hold, or are held by others, about this subject?

Clarifications and illustrations

Clarifications and illustrations are often used to help us understand ideas and arguments. Here is an example of each – read them closely and see if you can tell them apart:

	Clarification	Illustration
1 By coronary heart disease, I mean a group of diseases that involve reduced blood flow to the muscles of the heart itself, resulting from the narrowing of the coronary arteries.	◯	◯
2 Cultures all around the world celebrate dancing in public. In China, many couples used to perform publicly in parks to ballroom dancing music played through loudspeakers.	◯	◯

Clarification: spells out what is meant by a particular phrase, idea or line of thought

The first is an example of a **clarification**: it takes a phrase or an idea (in this case, coronary heart disease) and clarifies what is meant when it is used. The second is an **illustration**. Having made a point – that cultures all around the world celebrate dancing in public – a specific example of the point is supplied in order to show how the point may apply in a particular instance.

Illustration: a particular instance of a general point

A clarification may sound similar to supplying the definition of a word or concept, but it can also apply to a more general explanation of what an author is interested in or means. For example, if I am writing an essay on research ethics in sociology, I might begin by clarifying my focus:

> Research ethics is a contentious field. For the purposes of this essay, I will largely be referring to research ethics within the field of sociology; this is not to suggest that many other fields do not face their own version of these challenges.

We can think of illustrations as a special kind of clarification: a particular example is used to illustrate what is meant by a larger idea. In my essay on research ethics, I might use a particular case to illustrate a general principle:

> Before starting any research, you must obtain ethics approval in the form of written confirmation from your department – bearing in mind that standards can vary from country to country. One recent piece of research involving questionnaires about intimate sexual behaviour was successfully approved in Australia, but had to be substantially rewritten before it could be approved in America.

An illustration may simply sound like a posh term for an example – and in many ways it is – but it puts a useful emphasis on the fact that not every example can illustrate a general point effectively, and that a good example is one selected for both its relevance and its usefulness in clarifying a larger point.

EXPLANATIONS: THE BUSINESS OF REASONING BACKWARDS

Having looked at some forms of non-argument that do not feature reasoning, it's now time to consider one that does: explanations. Explanations can be difficult to distinguish from arguments, because both of them offer reasons in support of something. Indeed, some textbooks treat explanations as a special kind of argument. In this book, however, I've decided to keep them separate, both because this keeps us closer to the everyday sense of each word – and because they entail fundamentally different forms of reasoning.

Explanation: a suggestion for the reason or reasons that something came to be the way it is

What's the fundamental difference between arguments and explanations? While an argument attempts to persuade you that a particular conclusion is true through reasoning, an **explanation** takes it for granted that something is true – then sets out to explain how or why it happened.

In a sense, explanations are an inversion of arguments: they reason *backwards* from a conclusion that is assumed to be true. In effect, an argument addresses the question of *what reasonably follows* from certain premises that are believed to be true; while an explanation addresses the question of *how* something you believe to be true can *reasonably be accounted for.*

Well-reasoned explanations are both a vital form of reasoning and a major element of most scientific and philosophical research. Most worthwhile enquiries will at some point entail the question 'why?': why the world is like it is, why one thing happened rather than another, why someone did something. Everyday life and speech are full of explanations too. Here's a simple example:

I stopped eating lots of bacon because I was worried about my heart.

Even though this includes the word 'because', I am not making an argument, because I am not trying to persuade you of the fact that I have stopped eating lots of bacon. Rather, I have begun with a statement of fact that I expect you to accept as true – 'I stopped eating lots of bacon' – and have then offered an explanation of how this fact came to be: 'because I was worried about my heart'.

Is my explanation the whole truth? Almost certainly not. The reasons behind even an apparently simple decision are likely to be more complex than I can express in a single sentence. Why did I become worried about my heart? Why did this make me stop eating bacon in particular? What other factors are involved? A 'why' invariably involves further 'whys'.

Another way of putting this is that explanations are stories – and there are always more stories to be told. In this sense, they're one of the most contested and slippery ways we can use our reasoning. Consider the following three examples: are these explanations or arguments?

		Explanation	Argument
1	Tom read on the British Heart Foundation website that healthy eating and staying active help keep your heart healthy. As a result, he decided to change his diet and to go jogging twice a week.	○	○
2	Her husband no longer eats butter or drinks full-fat milk. She showed him a picture of clogged arteries which frightened him into changing his eating habits.	○	○
3	I go running twice a week because it helps me keep my life feeling balanced.	○	○

None of these is, in fact, an argument! In the first example above, I am offering an explanation rather than an argument because I am not trying to persuade you that something is true. I am simply reporting the fact that Tom is now going jogging twice a week, and that the explanation for this is some material he read about the importance of staying active.

In the second example, it's the same story. It is presented as a fact that her husband no longer eats butter or drinks full-fat milk – and the explanation for this is that he was shown a picture of clogged arteries which frightened him into changing his habits.

Finally, the third example offers in a single sentence an explanation for why I go running twice a week: because it helps me keep my life feeling balanced. You may or may not believe what I am saying; if you wish to offer a rival explanation, however, you'll need to produce some pretty compelling evidence.

One reason that explanations can be tricky to tell apart from arguments is that they have a similar structure, and use similar words, such as 'because' and 'since'. If you're trying to distinguish between them, ask:

- Is someone trying to persuade me that something is true (argument) or simply trying to inform me why something is the way that it is (explanation)?
- Is the thing for which reasons are being offered a completed event in the past that is presented as a fact (explanation) or a possibility that I am being asked to agree with (argument)?

Explanations are significant in critical thinking, and it's a mistake to treat them as less complex than arguments. Deciding between rival explanations is one of the most important everyday critical thinking tasks most people face – and one that often demands evidence-based investigation. In Chapter 5, we'll look at this kind of investigation in more detail. For now, here are two general principles for comparing the quality of explanations:

- A good explanation is able to account for all the evidence in a particular case, and does not simply ignore inconvenient facts.
- A good explanation tends to be economical: it has no unnecessary steps or assumptions. In general, a simpler explanation that accounts for all the facts is preferable to a more complex explanation that does the same.

For example, imagine that I have just been caught driving too fast by the police, and you are required to decide between the four possible explanations below as to why I was driving like this. Here's some information from an imaginary police report to help you choose:

Upon inspection, the car's speedometer turned out to be working perfectly; a phone call revealed that the driver's mother was perfectly healthy; and a search of the police database revealed that it was not his first time being caught speeding.

Best explanation

1   I was driving too fast because of temporary freak weather conditions.   ◯

2   I was driving too fast because I have a fast car and love driving it fast.   ◯

3   I was driving too fast because I'm dashing to see my sick mother.   ◯

4   I was driving too fast because my speedometer is faulty.   ◯

Based on the information above, the second explanation – that I was driving too fast because I have a fast car and love driving it fast – looks like the best fit. Importantly, this doesn't mean it's definitely correct. But it does mean that I would need to come up with something else that explained all the facts more efficiently and effectively if I wanted to change your mind (or that of the police).

SMART STUDY 1.2

Six key types of content

Here is a list of the different kinds of information and expression we have looked at in this chapter, with a brief summary of each. We have looked at four types of information presented without reasoning:

Description: purely reporting information in a direct way	**Opinion/Belief**: reporting a personal judgement or preference
Summary: providing a brief outline of key information	**Clarification/Illustration**: spelling out or demonstrating a particular concept

And we have also looked at two types of information presented with reasoning:

Argument: persuasion through reasoning in support of a conclusion	**Explanation**: reasoning backwards from something assumed to be true

Between them, these classes of content describe much of what is likely to be relevant and meaningful within a piece of work you are studying or writing yourself. Try to classify each example below as either a description, a summary, an opinion/belief, a clarification/illustration, an argument or an explanation. Two are arguments; and there is at least one example of every other type of content:

1   An odd number of participants means that someone will always be left out when picking two balanced teams: for instance, five people means two teams of two and one person left out; seven people means two teams of three and one left out; and so on.

2   My cake burned to a crisp because I accidentally left it in the oven for 13 hours.

3   The IKEA wardrobe gently collapsed as I stepped back to admire my handiwork; it was almost majestic to behold its gravitationally induced self-disassembly.

4   Here is how I built the wardrobe: first, I threw away the instructions; second, I fitted all the round bits into the little holes; third, I screwed together everything that looked like it needed screwing; fourth, I hit all the remaining parts with a hammer.

5   It's immoral to buy incredibly cheap clothing on the high street.

6   It's immoral to buy incredibly cheap clothing: people work long hours for terrible pay in overcrowded factories in order to produce it.

7   The clothing we buy is only incredibly cheap because the people making it are paid so little.

8   He ran rapidly and gracefully out of the water because he had a crab attached to his face.

9   You ought to buy copies of this book for all your friends: it is excellent value and will almost certainly make them all cleverer.

10   I only wrote the previous example because I was running out of ideas.

The two arguments are: (6), which attempts to persuade you that it's immoral to buy cheap clothing, using the reasoning that the people who make it work in terrible conditions; and (9), which attempts to persuade you that you should buy this book for your friends, using the reasoning that it is excellent value and will make them cleverer. Whether either of these constitutes a good argument is something for you to ponder.

Among the rest, (1) is a clarification/illustration: a general point is made, and then illustrations provided of particular cases that show how it works. Number (2) is an explanation: I am explaining why it is that my cake burned to a crisp. Next, (3) is a simple description (of a wardrobe collapsing), while (4) offers a summary outlining the process by which I built the wardrobe so badly, and (5) is an opinion/belief – it's probably most accurate to call it an opinion about the immorality of cheap clothing, likely to be based on underlying beliefs about what is right and wrong.

As we've already seen, (6) is an argument (notice that it takes the opinion expressed in (5) and turns it into an argument by expressing reasons to support that point of view) while (7) is an explanation on the same theme – it simply seeks to explain the fact that the clothing we buy is incredibly cheap. Similarly, (8) is an explanation of why someone ran out of the water. Finally, (10) is also an explanation, providing an account of why it is that I wrote the previous example.

Overall, how many did you correctly identify out of ten? If it was fewer than seven, I'd recommend you look briefly again over the ones you found most difficult.

THINK ABOUT THIS 1.1

Can you think of other kinds of information offered without attempts at persuasion beyond those listed in this chapter? How might you classify them?..

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WHAT ISN'T AN ARGUMENT? PERSUASION WITHOUT REASONING

While arguments are an attempt to persuade us of something using reasoning, **rhetoric** is an attempt to persuade us by other means. Rhetoric is a general term for the art of persuasive speaking or writing, dating back to the ancient Roman and Greek world. A great variety of rhetorical techniques are deployed by speakers and authors, with the intention of bringing their audience around to a particular conclusion or point of view. We'll examine rhetoric in depth in Chapter 7 – for now, it's worth running through a few of its basic features.

Rhetoric: the attempt to persuade by appealing to emotion rather than to reason

In practice, most of the arguments (and the non-arguments) we encounter in real life will have some rhetorical elements to them. Rhetoric isn't inherently a bad thing, but we need to pay very close attention to how the **style** in which something is written and presented can affect our thinking in ways that have nothing to do with reasoning.

Everyone writes in a different style, and there are different styles appropriate to different subjects. When we are writing a message to friends, we use different words and phrases than if we are writing to our parents. If you were writing a story, a lyric or a poem, you would do very different things with language than if you were writing an essay or describing a scientific experiment.

Style: the way something is written – its words, phrases and the structures of its language; different topics and audiences require very different styles

In general, academic writing requires a style that is as clear as possible: that says exactly what you mean and that is not confusing. A degree of difficulty is an inevitable feature of academic disciplines that demand specialist terms and high-level understanding. Unfortunately, some academic writing can also be needlessly difficult – either in terms of its structure and vocabulary, or in terms of its length and the complexity of its sentences.

This lack of clarity can itself be a rhetorical manipulation: a way of suggesting that you are an expert, and that only experts can deal with the complexities of your subject. In general, it's a good idea to be wary of very difficult writing. It may be concealing a lack of precision, understanding, evidence – or simply the fear that expressing something too clearly devalues expertise. Then again, even the use of rational and reasonable language can itself be a persuasive technique ('I am a serious scientist: you can trust me'). One of the first things you need to do when looking at any piece of writing is thus to ask:

- What style of writing is this?
- What are the intentions behind this style: how does the author want me to feel?
- Is there rigorous, convincing reasoning behind what's being presented, or am I being asked to accept it on other grounds?

Beyond style and tone, rhetoric can also encompass elaborately emotive forms of reasoning and appeal. Here are a few examples. In each case, how might you describe the particular manipulation I'm using to try to make my case?

1 You look great today! So professional, so powerful. You should let me come and work with you, given that you're such a brilliant leader and entrepreneur.

2 It's time for a change: for something new and for someone fresh and keen in your workplace – and that someone is me.

3 I'm fending off job offers from a dozen potential employers right now – but it's you I really want to work for. What do you say?

4 If you don't give me a job, I really don't know what I'm going to do – I've got nothing. You are my only hope. Please.

5 If you don't take someone like me on in the current business climate, your company will fail; just see if it doesn't. You're in trouble and you need my help.

6 I've worked with some major-league disruptors in the disintermediation space. I know how to radically rethink verticals and horizontals. I can add real value.

 In order, these examples embody:

1 **Flattery**: praising someone in order to get them to do what you want.
2 **Appeal to novelty**: saying that something is new and so it must be good.
3 **Appeal to popularity**: saying that something is popular, so it must be good.
4 **Appeal to sympathy**: playing on the heartstrings.
5 **Appeal to fear**: trying to frighten someone into agreement.
6 **Jargon**: using fancy, largely meaningless words in order to sound smart.

There's plenty more where this came from. When it comes to critical thinking, you need to recognize as far as possible the rhetorical elements of any text you are engaging with – and then to disentangle the underlying reasoning from the materials surrounding it.

Let's take a look at a rhetorical piece of writing, sentence by sentence. Can you see where the author is attempting to persuade you using emotional appeals and rhetorical devices rather than rigorous reasoning?

(1) The world of business is crazy! (2) Everyone is always talking about disruption, new ideas and new technology. (3) They say artificial intelligence is going to put half of the world's workers out of a job. (4) But I don't believe it. (5) I think that we are going to end up with a world where everything we do involves smart machines, but these smart machines allow us to find all kinds of interesting new work. (6) After all, people have always been afraid of new technology. (7) Just look at the Luddites, smashing up cotton mills during the Industrial Revolution back at the start of the 19th century. (8) Yet everybody didn't stop working. (9) They just couldn't imagine what all the new kinds of work would look like – until technology created it.

Sentence (1) is pure rhetoric: 'The world of business is crazy!' This is emotional language, complete with an exclamation mark for emphasis. It's trying to get you on the author's side: to create the expectation that you're about to hear some zany stuff about the world of tech, and to create an informal rapport with the author.

Sentence (2) is also rhetorical rather than an attempt to provide reasoning or make an argument: 'Everyone is always talking about disruption' we are told, which is unlikely literally to be true. The author is using **exaggeration** to set the stage: in this case, to suggest that 'everyone' is 'always' saying one thing, but that you are about to be presented with an exciting alternative point of view.

Sentences (3) and (4) deliberately contrast what 'they say' with the fact that 'I don't believe it'. This is conversational language, designed to create a sense of drama and engagement – so that by the time we finally get to sentence (5) and find out what 'I think', we are ready to start nodding our heads, even though we have as yet seen no reasoning or evidence. Sentence (5) contains the concluding idea that the author wants you to believe – although it's only after you get to the end of the passage that you are likely to work this out.

As often happens in everyday prose, the reasoning in support of this conclusion is presented after, rather than before, that conclusion (it can be more rhetorically effective to start with your conclusion, and then to justify it). 'After all' begins sentence (6), before telling us that people have 'always been afraid of new technology' – a piece of reasoning expressed in the form of an **over-generalization**.

Sentences (7) and (8) further support the conclusion by inviting us to 'look at the Luddites' in the 19th century – making the assumption that the way things were 200 years ago is automatically relevant to the way things are today. This isn't a strong form of reasoning.

Exaggeration: over-stating your case, often as a rhetorical tactic; like over-generalization, this is a way of making a far bigger claim than is actually the case

Over-generalization: suggesting that something is more generally true than it actually is, often as a rhetorical tactic; making a far broader claim than is the case in reality

ONE

FIRST AND FOREMOST: **SLOW DOWN.** CUT YOURSELF SOME SLACK! DOES WHAT'S IN FRONT OF YOU **MATTER** AND REQUIRE DEEP **THOUGHT?** **IF SO, PAUSE.** IT DESERVES A STRATEGY. IF NOT, **DON'T WORRY** TOO MUCH. GET ON WITH IT, **GET IT OUT THE WAY.**

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The example may or may not be relevant, but we need further details if we are to be convinced. Finally, sentence (9) offers the observation that people in the early 19th century 'couldn't imagine what all the new kinds of work would look like' – which is hardly surprising, but may not be as strong a piece of reasoning as the author thinks.

Overall, we might strip away the rhetoric and express the ideas at the heart of this example like this: 'People have always feared new technology. For example, the Luddites in the 19th century couldn't imagine the opportunities new technology would create. But their fear was misguided. And the same is true today when it comes to fears around technology and jobs.' This is a less exciting piece of prose – but it's far easier to engage with its strengths and weaknesses as an argument. This process of stripping down and clarification is the focus of our next chapter, and the foundation of critical engagement with others' ideas.

THINK ABOUT THIS 1.2

What are the main differences in your writing style between everyday communication – email, messages, status updates – and formal academic writing? Why do these differences exist? ....
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SUMMARY

An **assertion** is a statement of fact or belief, provided without support or justification.

An **argument** is an attempt to persuade someone through reasoning that they should agree with a particular conclusion. You can split this into two key elements when identifying arguments:

- **Reasoning** is being used to…
- …make the case for a particular **conclusion**.

Arguments are important for critical thinking. By providing reasoning, seeking to justify a particular claim, arguments allow us to work out whether or not we agree with this reasoning – and to compare different arguments in order to see which one we find the most convincing.

When you're trying to work out whether someone is making an argument, it's often best to begin by seeing if you can **find a conclusion** that they're trying to prove.

It's important to distinguish between arguments and attempts at **persuasion without reasoning**. **Rhetoric** is the attempt to persuade by making an emotional appeal rather than

by using rigorous reasoning. Paying close attention to writing **style** is important when reading critically: don't be deceived by vagueness, exaggeration or difficulty.

Much of the time, you will also encounter **information without persuasion**. It's important to be able to identify and evaluate this material separately from arguments. We've looked at four main types of information that don't entail persuasion:

1   **Descriptions** simply report information without evaluation or comment.
2   A **summary** provides a brief outline of key information, often setting out the main points covered in a longer piece of work.
3   An opinion or belief presents someone's point of view without offering reasoning. **Opinions** tend to be personal judgements based on facts; while **beliefs** tend to be convictions based on morality, faith or cultural context.
4   A **clarification** spells out what is meant by a particular phrase, idea or line of thought, while an **illustration** offers a particular instance of a general point.

Finally, **explanations** are a special form of reasoning that works backwards from a claim about the world – telling the story of how something happened.

An explanation suggests the reasons that something came to be the way it is. The **best explanations** are able (1) to explain all the available evidence in (2) as simple a way as possible.

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