

3

Underpinning psychological theories

Synopsis

Chapter 1 states that psychology is the study of the human mind and its functions as it relates to human cognition, behaviour and experience. The chapter also examines in detail the social determinants of health and disease. It is argued that because a number of behaviours are associated with ill health and behaviour change is seen as a viable way of tackling behaviours associated with health inequalities, pharmacists should therefore be equipped with the tools required to affect their patients' health and illness-related behaviour at the individual level.

This chapter explains human behaviour by exploring psychology in some detail. It presents an overview of a number of underpinning psychological theories relevant to pharmacy practice. The perspective taken is principally that of cognitive psychology – as opposed to, for example, a biological or evolutionary perspective. The key feature of this chapter is that it uses examples to illustrate psychological theories in a pharmacy practice context – something that is developed in Chapters 4 and 5. Another key feature is the arrangement of the chapter into two main parts, with the first providing a basic framework for relating thought to decision making and behaviour, and the second part providing a basic framework for understanding the role of emotion in behaviour.

Learning outcomes

You should be able to demonstrate knowledge and understanding of the following after working through this chapter:

- the relationship between thoughts and the decision-making process
- the interplay of thoughts and emotions.

Introduction

The current chapter focuses on providing the underpinning psychological knowledge. Because decisions can impact on health behaviours, this chapter first examines the mechanism through which thoughts influence decisions. There is then an exploration of emotion and its interrelationship with thought and behaviour. The influence of thought on behaviour and therefore on health can be understood with the help of cognitive psychology, which is a branch of psychology concerned with the operation of the human mind. Social cognition is helpful too, as it links cognition with the social world in situ. Human cognitive processes include perception, attention, memory, learning, thinking, problem solving, decision making and language (Braisby and Gellatly 2005). Although not all of these subjects can be tackled in one chapter, cognitive psychology can be explored for its explanation of information processing in the mind as it relates to decision making.

How can thoughts influence human decisions?

How do people make decisions? Normative theories of decision making centre on ideal decision making – what ought to happen in a perfect model (Thornton *et al.* 1992). Although normative theories attempt to define the perfect decision, they are dependent on a specific view of human rationality, where it is in fact possible to make an ‘optimal’ decision. Rationality is the ability to use reason to make decisions, for example, regarding possible actions or to determine the optimal choice. But people can also make decisions in the absence of clear information and these decisions can appear irrational to others. In fact, in the real world, people are often faced with information that is either partial or vague, and so decisions are made by what appear to be ‘leaps in the dark’. A possible explanation is that, unlike what is suggested by normative theories, people do not operate with machine-like logic, so they resort instead to thought processes that appear to be reasonable to them at the time.

Exploring the concept: decision making in an imperfect situation

For example, imagine being asked to take part in a health questionnaire on your next visit to the supermarket. You might be tempted to take part when you hear that all completed surveys are entered into a prize draw. You imagine that your entry might win you a holiday to Florida. On the other hand, if you stop to complete the survey, you might miss your scheduled bus, which would mean a long walk home

in the dark or the rain. What if the confidentiality of the information you provide is breached and your health insurance is affected? What if you win the holiday and meet your future partner in Florida? What are all the pros and cons of completing or indeed not completing the survey and how likely are they to occur? What is the value you attach to each outcome? Normative theories assume it is possible for people to apply this level of analysis when faced with unclear choices and that indeed a perfect decision exists. But how can ideal decision making be possible for humans without the application of a sophisticated algorithm or an exhaustive comparison of all available options? An alternative view is that, under conditions of uncertainty, choices are based on rules-of-thumb. The last time you completed a health questionnaire, it took you too long and you didn't win the prize – decision made. You politely decline and move on.

One justification for this line of thinking is that people build models of the world – schemata – which they then use to understand subsequent social interactions (Miell *et al.* 2007). From a biological perspective it is thought that humans need to keep cognitive processes minimal to make the best use of the processing capacity in the brain, which has resulted in the formation of schema theory. People's schemata are their own generalised representations of social phenomena based on shared knowledge about people/events/roles/objects as stereotypes. A schema about something (e.g., a type of profession) helps people recognise and understand it better the next time they encounter an example of it (building a picture of a physiotherapist in the mind, including what to expect can help in later interactions with the same or indeed other physiotherapists). You might think of this process as stereotyping. Another helpful concept here is that of heuristics, which relates in particular to judgement and decision making when knowledge is vague (Gigerenzer and Gaissmaier 2011). Heuristics are strategies based on readily available mental representations of the world, which can be evoked during decision making to make the process more efficient. It is thought that people's access to heuristics helps them make decisions under uncertainty. This approach is in contrast to normative theories, which, as briefly outlined above, are based on the attainability of the perfect choice.

The idea of heuristics relies on a more pragmatic view of rationality, which is that cognitive processes are not designed to return rational decisions so cannot be guaranteed to ever produce 'optimal' outcomes. This view of cognition is known as 'bounded rationality' – the notion that in truth human rationality is limited by the mind's ability to completely process all the information necessary to arrive at the perfect 'rational' choice (Chase *et al.* 1998).

Since thorough and exhaustive scrutiny of all available information is not normally achievable, the concept of bounded rationality necessitates the use of alternative systems, for example, heuristics, to arrive at decisions. Heuristics draw on people's propensity to access readily available mental representations, for example, rules-of-thumb or schemata, to inform their choices. The idea of heuristics enables rationality to operate outside of normative theories, to fall in line with real-life experiences.

A brief examination of heuristics

An array of heuristics has been investigated and proposed (Braisby and Gellatly 2005). Psychologists investigating people's decision making under conditions of uncertainty have identified, for example:

- the anchoring and adjustment heuristic
- the availability heuristic
- the representativeness heuristic.

Anchoring and adjustment heuristic

The anchoring and adjustment heuristic operates when people estimate the answer to a question based on an initial value presented to them as part of the question.

Exploring the concept: the anchoring and adjustment heuristic

Imagine the supermarket example again but this time in the context of the pharmacy counter. In fact, you are the locum pharmacist and today, a Saturday, is your first day at the store. On signing the responsible pharmacist register, the technician makes a comment about the number of pharmacists who locum at the store. She asks if you can guess whether this number is higher or lower than 20. You make an estimate and guess 17. What if the technician had asked whether you think the number is higher or lower than 5? According to the anchoring and adjustment heuristic, the initial value posed in such a question (the anchor) acts as a basis for the answer, albeit it is adjusted to some extent to yield the final estimate.

Availability heuristic

The availability heuristic operates when people predict the likelihood of something by the ease with which similar instances can be recalled.

Exploring the concept: the availability heuristic

Now imagine you are halfway through the same locum-day and a patient asks you for the best over-the-counter product for a chesty cough. The (fictional) brand Best-for-Cough comes to mind. The recent television advertisement claimed this product is effective in 95% of cases. You immediately reach for Best-for-Cough's new Chesty Mucus Cough formulation. Is the product more likely to work compared with any other product or are you making the recommendation because the words in the advert come to mind? According to the availability heuristic the frequency or probability of an event (e.g., the probability of the product being effective) is judged by the number of instances of it that can easily be brought to mind. Other products may be just as effective but if they are not 'on the radar' so to speak, they are less likely to be recommended.

Representativeness heuristic

The representativeness heuristic is used when people categorise things/events by considering their similarity to the group/category.

Exploring the concept: the representativeness heuristic

Finally, and again in the same scenario, imagine being told in advance that although hectic, Saturdays provide one relief because the two very difficult customers who are sisters and can be identified by their characteristic beret and cape, and who insist on buying multiple packs of codeine, normally only visit during the week. Then imagine an elderly lady approaches the pharmacy counter near closing time to ask for a strong painkiller, preferably containing codeine. You might well think that this lady is one of the 'difficult' sisters you were warned about earlier because she fits the general perceived characteristics. According to the representative heuristic people estimate the probability that an item belongs to a category by judging the degree to which the item is representative or typical of the category.

A brief examination of cognitive biases

The human propensity to use heuristics, although helpful, can also lead to erroneous judgements because of a concept known as cognitive bias, the by-product of making decisions under bounded rationality (Tversky and Kahneman 1974). For example, mainly through experimental research,

heuristics have been linked to the following biases, which have been recognised in medical practice – for example, see Klein (2005) and Bornstein and Emler (2001) (Fig. 3.1):

- the overconfidence bias
- the base-rate fallacy
- the conjunction fallacy
- the sample size fallacy
- the regression fallacy
- the framing effect.

Using the experimental method to study social cognition must of course be treated with some degree of caution, as studying phenomena (which are social) in the laboratory rather than in situ can lead to questions of ecological validity – with the potential that results produced in the laboratory are not exact reflections of the social *truth*. After all, people in the laboratory are not faced with any sense of real urgency and are not connected emotionally with the experimental scenarios, as they would normally be in the outside world. Nonetheless, where a positivist epistemology is subscribed to and questions are framed appropriately, the experimental method does enable social phenomena to be studied in a less complex and more controlled manner.

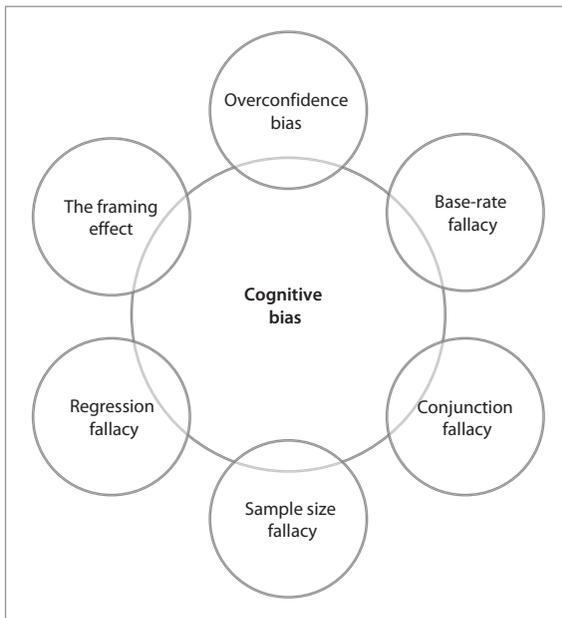


Figure 3.1 Examples of different types of cognitive bias associated with the use of heuristics.

Overconfidence bias

Now returning to the different types of erroneous judgements, the overconfidence bias concerns claims that people's expressions of confidence in the accuracy of their own judgements are largely unreliable, resulting in higher confidence ratings when measured against actual correctness.

Exploring the concept: the overconfidence bias

Let's return to the supermarket pharmacy where you are a locum on that Saturday. Imagine being asked by a patient whether it is paracetamol or ibuprofen that is safer in early pregnancy. What about aspirin versus ibuprofen or paracetamol versus aspirin? How confident would you be of the accuracy of your judgement each time? The overconfidence bias concerns claims that people's expressions of confidence in the accuracy of their own judgements are largely unreliable, resulting in overconfidence when measured against correctness. What are the consequences of the overconfidence bias for patients involved in self-care, for example?

Base-rate fallacy

The base-rate fallacy is the failure to take account of the prior probability of an event when making a judgement.

Exploring the concept: the base-rate fallacy

Remember the thinking, again in a previous example, that the elderly patient approaching the counter was one of the 'difficult' sisters, despite the fact that staff had explained the sisters only normally visited during the week (the baseline probability of a visit was low). A base-rate fallacy could have occurred, as a result of the failure to take in the actual probability of a visit by the sisters when making the judgement.

Conjunction fallacy

The conjunction fallacy is an error according to which a combination of two or more attributes is judged more probable than either attribute on its own.

Exploring the concept: the conjunction fallacy

Now supposing a patient came into the pharmacy expressing concern that based on her symptoms and information on the internet she fears

a diagnosis of ulcerative colitis. She has read about treatment options and also fears that if the doctor makes this diagnosis and prescribes her the relevant medication, she will experience the severe side-effects she has read about. In fact, she strongly believes that if she visits the doctor she is more likely to end up with an exacerbation of her symptoms due to side-effects of medication than just be diagnosed with ulcerative colitis. This is a fallacy because the concurrence of being diagnosed with ulcerative colitis and finding herself with worse symptoms caused by the medication cannot exceed the probability of the diagnosis alone. The conjunction fallacy is an error according to which a combination of two or more attributes is judged more probable than either attribute on its own.

Sample-size fallacy

The sample-size fallacy is also important. It describes the failure to take account of the sample size when estimating the probability of obtaining a particular value in a sample obtained from a particular population.

Exploring the concept: the sample-size fallacy

Imagine in this same scenario that normally around 300 patients visit the pharmacy every day to purchase an over-the-counter product from the healthcare assistant. What is the likelihood that an unusually high number of patients will ask to consult with you, the pharmacist, in any one day? What would be the likelihood if you worked there for a week or a month or a year? You might think the probability is the same in all cases but in actual fact the probability of an unusually high sample average is much greater in a small sample (one day) than in a larger one (one month) – think of the normal distribution. The sample-size fallacy is a failure to take account of sample size when estimating the probability of a particular rate in a sample taken from a larger population. This erroneous pattern of belief is explained by the use of the representativeness heuristic, which is not sensitive to sample size. A common form of the sample-size fallacy is people's inclination to think that a small sample is typical of its parent population.

Regression fallacy

The regression fallacy is a mistaken assumption that interprets regression towards the mean as attributable to something other than chance.

Exploring the concept: the regression fallacy

Now suppose a particular patient does ask to see you, and interestingly, with a theory about her visits to the pharmacy. On speaking with her, you discover she has formed a particular belief relating to her experience of the pharmacy, which does not quite ring true. The patient explains that when she visits the pharmacy during the week, the pharmacist sometimes makes extra time to speak with her and so the patient leaves feeling very ‘looked after’ and content. Yet if the patient has a particularly good interaction with the pharmacy one day, when she returns the next time, she somehow ends up leaving the premises less satisfied. Curiously, the next visit after that will usually lead to a better interaction again and so on. In fact, the patient has come to believe that a good interaction is somehow counterproductive to her future experiences of the pharmacy and that a colder interaction is in some way better overall. In reality, because of a regression towards the mean, good or bad experiences are just as likely to be followed by an average one, which explains the resultant feeling. The regression fallacy is a mistaken assumption that interprets natural regression towards the mean as attributable to something other than chance.

Framing effect

Finally, the framing effect describes the impact that the explanation, labelling or arrangement of a problem can have on responses to the problem. This is particularly important in pharmacy, where patient information leaflets attempt to convey medication-related facts in product packaging, and where advertising is used to convey effectiveness data for medicines on the market.

Exploring the concept: the framing effect

A final example using the locum pharmacy scenario, involves an interesting interaction with a patient who brings in a cutting from a well-known national tabloid. The cutting is in fact an advert for a new ‘miracle cure’ for arthritis, claiming it to be 33% better compared with prescription-only anti-inflammatory medication. On closer examination you note the advert in fact relates to the purported safety of the herb *Boswellia*. The small print reports the outcome of a small study where 15 of 100 patients taking non-steroidal anti-inflammatory drugs (NSAIDs) reported stomach problems compared with only 10 of 100 patients taking *Boswellia*. Taking these numbers at face value,

the 33% relates to the relative risk reduction in reported stomach pains. Using the same data, the absolute risk reduction in stomach pains would be expressed as 5%. This is not as impressive and yet the patient is clearly impressed with *Boswellia*. Is it likely that the absolute risk reduction figure would have been used in the advert? Would your patient's response have been the same? The framing effect describes the impact that the explanation, labelling or arrangement of a problem can have on responses to the problem.

What is attribution theory?

An interesting and related concept concerns the interplay between schemata and motivation in the form of attribution theory. The psychologist Fritz Heider believed that people use schemata to build models of the world, which they then use to understand *why other people do what they do* – this particular idea is known as ‘attribution theory’ (Braisby and Gellatly 2005). Attribution theory can help us understand the way in which people perceive and explain their social environment, specifically in relation to the reasons they give for other people's behaviour in the form of feelings, beliefs and intentions. Although it may appear from the discussions earlier in the chapter that schemata effectively dominate people's thinking, Ruscher *et al.* (as cited in Buchanan *et al.* 2007), through carefully planned experiments, showed that *motivation* can also play a role when considering, in particular, people's decisions about others. So, for example, a simple conceptualisation of schema theory might be too reductionist and as such not take account of the human capacity to think outside of the confines of their biology. Fiske and Taylor (as cited in Buchanan *et al.* 2007) suggested people act as ‘motivated tacticians’ and ‘fully engaged thinkers who have multiple cognitive strategies available and choose among them based on goals, motives and needs’.

Theories of attribution have been developed to understand the reasons behind ours and others' actions. The experimental method has been used extensively in relation to attribution theory and related research – to develop generalisable theories about the social world. One of the earlier experiments used by Heider and Simmel (as cited in Buchanan *et al.* 2007) provides convincing evidence that people form narratives to match their observation of others and events. In terms of understanding other people's behaviour, Heider argued that people ascribe internal or external causes to others' behaviour, along a continuum of causality. Jones and Davis (as cited in Buchanan *et al.* 2007) contributed to this work by suggesting that people tend to ascribe internal causes to others' behaviour more than to their own, in an attempt perhaps to understand the person rather than merely their action.

Exploring the concept: attribution theory

Imagine receiving the wrong medication from your own local pharmacist. What would be your reaction in terms of apportioning blame? Would you think the pharmacist a careless and sloppy worker or might you blame their employer for not providing sufficient staff to help with second-checking of dispensed items? A comment relating to the pharmacist's character, as a sloppy worker, for example, is an internal attribution of blame (there is something internal within the pharmacist that has resulted in the accident) whereas blaming the working conditions is an external attribution.

Harold Kelley went so far as to devise a *co-variation matrix* suggesting that, in struggling to make sense of other people's actions and in wanting to assign the cause of specific behaviour as internal or external, people fit knowledge of others' past actions to current situations in a systematic manner using three variables of consistency, distinctiveness and consensus. This structured approach has enabled scientific verification of Kelley's theory through experimental methods, for example, through the use of vignettes that offer selective information, based on which participants form causality judgements (as cited in Buchanan *et al.* 2007). Using vignettes is an example of an experimental method with potentially low ecological validity, since reduction of events to much controlled levels can mean detachment from real, everyday experiences.

Exploring the concept: Kelley's co-variation matrix

Kelley believed people combine three types of information to explain behaviour: consensus, consistency and distinctiveness. Imagine coming into work one Monday to find one of your technicians smelling of alcohol, acting out of character and upsetting the healthcare assistants. In relation to this behaviour, consensus is the behaviour's similarity to other people's behaviour – how unusual is this behaviour in general? In the context of pharmacy, it would be fair to say it's unusual to find technicians arriving at work drunk on a Monday morning! However, is drinking to excess particularly unusual? Consensus might therefore be judged as high (this behaviour is perhaps not that unusual for the general UK population?) Consistency is the degree to which this particular event is similar to the person's past behaviour in a similar situation – is this typical behaviour for the technician on a Monday morning? From the above information, it does not seem that this is the

technician's typical behaviour at work. Consistency is therefore also low (not typical of the technician in this situation). Distinctiveness is the extent to which the behaviour is uncharacteristic in general. Does the technician normally drink excessively, say outside of work? Imagine the technician normally abstains from drink. Distinctiveness is therefore high (this is not something the technician does in other circumstances). According to Kelley, people attribute others' behaviour to external, situational causes when consensus is high, consistency low and distinctiveness high – such as in this example – whereas they attribute internal causes when consensus is low, consistency is high, and distinctiveness is low.

Critics have pointed out with some evidence that Kelley's theory overstates the rationality of people's reasoning, perhaps because the experimental method cannot take into account the complexity of social life. For example, in everyday situations, as alluded to above, people explain the behaviour of others using internal attributions, a tendency known as *fundamental attribution error* – whereas they tend to select external attributions for explaining their own behaviour (known as the *actor/observer effect*). But fundamental attribution error may not have universal application. Miller (as cited in Buchanan *et al.* 2007) has shown through experiments using American participants versus Indian Hindu participants that culture and ideology may underlie attributional preferences. Western culture is more individualistic than many cultures in the East and may be impacting on people's attention when attributing cause, and thus causing fundamental attribution error. (Attributing internal causes to others' behaviour may just be unique in the West, where the culture is more individualistic.)

Exploring the concept: fundamental attribution error and the actor/observer effect

We will return here to the dispensing error example, above. According to fundamental attribution error, you (the patient) would be much more likely to blame the pharmacist for the dispensing error, a flaw in their character or style of working perhaps, than any external factors. According to the actor/observer effect, however, the pharmacist is much more likely to blame something external to themselves for the error, such as the working conditions or a sudden rush of patients.

Another aspect of attribution research that helps us understand the way in which people perceive and explain their social environment is related to the

self-serving bias of causal attribution, where successes are related to internal causes and failures to external ones. Self-serving bias has in fact been linked to cognitive bias – where attributions are based on thought processes, such as those relating to expectations rather than objective facts. Another way in which self-serving bias has been explained is through motivational bias linked to a need to present explanations in the best possible light, perhaps to boost self-esteem. There are difficulties with such theories though. For example, while Shrauger (as cited in Buchanan *et al.* 2007) found that those with higher self-esteem tended to make more self-serving attributions than those with low self-esteem, the direction of causation is unclear since either high self-esteem or self-serving attributions could be the cause or the effect. Nonetheless, there is evidence that attribution can impact on people's sense of self.

Exploring the concept: the self-serving bias

Imagine you are a hospital pharmacist in charge of medicines information services. An overhaul of your department means queries are now dealt with more efficiently than before. A review of the services returns an excellent rating. According to the self-serving bias, you are much more likely to attribute this 'success' to your and your team's hard work than any external factors (and why not!). On the other hand, imagine that the overhaul means queries take longer to deal with and the review returns a poor rating. According to the self-serving bias, you are much more likely to blame external factors for this rating than yourself – for example, you might make a case that the number of queries has unexpectedly increased in the period since the overhaul, or that budget cuts have lowered the total human resource available to answer the queries.

Human decision making can be error-prone, and research investigating people's performance on making formal judgements can suggest that humans are fundamentally irrational in their decision making. Yet there is also compelling evidence that humans do manage to live and operate in an uncertain world alongside one another. Indeed in real life, decisions are made using 'fast and frugal heuristics', simplified and speedy processing of information under bounded rationality (Gigerenzer and Gaissmaier 2011). Here, human decision making has been found to be highly accurate so it is important to consider heuristics and biases in the context in which they are naturally used, rather than contrived experimental settings. One natural setting of course relates to decision making in relation to health, which is the focus of Chapter 4. Here, building on this basic overview of thought and decision making, the interplay of emotion and thought is examined next.

What is the interrelationship between emotions and thoughts?

An exploration of emotion and its impact on thought and behaviour warrants particular consideration in the context of ill health, as does the converse relationship, which is the effect of thoughts and behaviour on emotion. Thus, before examining models that relate specifically to people's experiences of health and disease management in Chapters 4 and 5, the mechanisms through which emotion and thought interrelate will be examined. A typical view is that the concept of emotion is different from that of cognition – cognition is concerned with knowledge acquisition whereas emotion relates to feelings and mood. In addition, the field of psychology has traditionally focused to a greater extent on studying and defining cognitive processes than it has on emotion. However, research on emotion and specifically the interplay between cognition and emotion is also important, especially in relation to ill health where it is not uncommon for people to experience an initial or ongoing emotional response to their condition. How someone feels can influence their thoughts but interestingly how they think can also affect their feelings, and so on, but how closely linked are these two concepts?

Emotion relates to feelings and mood, which can be conceptualised in a number of ways (Izard 2009). The experience of emotion can be related to three components: subjectively experienced feelings, expression of emotion via a behavioural response, and a physiological response to emotion (Fig. 3.2). For example, fear of visiting the doctor can involve an unpleasant subjective experience of dread, a behavioural response that drives the person away from the doctor's practice, and a measurable physiological response such as increased blood pressure. The different types of emotion can be conceptualised in terms of basic emotions, such as the five emotions of anger, fear, sadness, disgust and happiness, or in a more sophisticated dimensional manner, as an interaction between emotion-related valence (pleasant/unpleasant) with arousal (calm/aroused). Evolutionary psychologists have even proposed a role for emotion in goal attainment, in mobilising physiological resources and in communication, and emotion is even considered by some as a source of information (Braisby and Gellatly 2005).

Can emotion influence thought and behaviour and vice versa?

Psychologists have been able to study and demonstrate with strong and varied evidence that emotion can affect thought. Experiments have been used to demonstrate the impact of (the processing of) emotion on different cognitive processes including memory, attention and semantic interpretation (construal of meaning) (Braisby and Gellatly 2005) (Fig. 3.3). Briefly, emotion can affect memory by influencing the coding of memory and indeed the recall of memory. In fact it has been found that clinically depressed patients, or

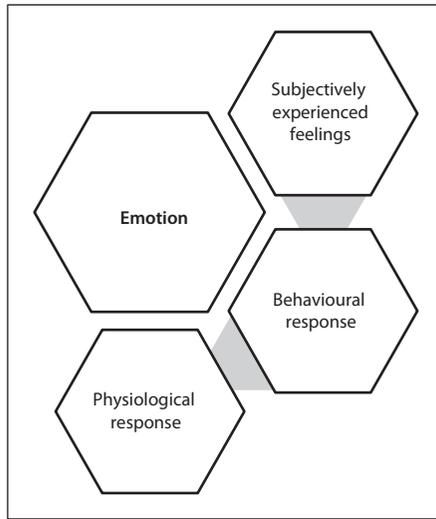


Figure 3.2 Conceptualising the experience of emotion. (Data from Izard 2009.)

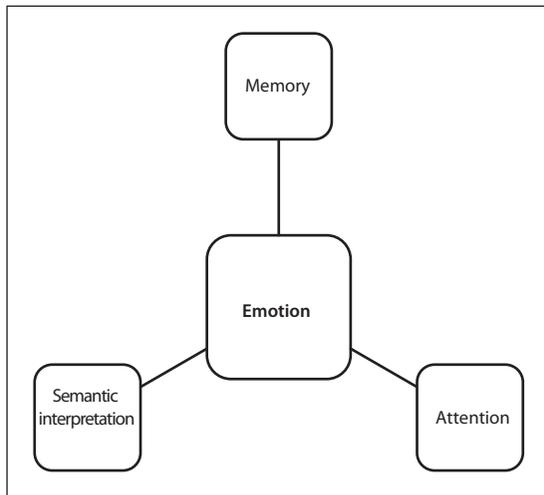


Figure 3.3 Conceptualising the effect of emotion on thought processes. (Data from Braisby and Gellatly 2005.)

those in constantly low mood, all show a negative ‘bias’ in terms of coding memory (i.e., are more likely to code negative material), despite the fact that ‘normal’ individuals have a positive (rather than neutral) bias towards memory. It has been suggested that the bias itself acts to reinforce depression in a vicious cycle. Indeed, such theories have formed the basis of interventions that attempt to break the cycle and thus alter cognition in order to *impact on emotion*.

Exploring the concept: the impact of emotion on memory

Imagine you are experiencing a period of work-related stress because your department is under-resourced. Then you become involved in an altercation with one of the clinical pharmacists about the ward rota. Your colleague suggests that while you have carried out thorough and careful wards visit that morning, you have neglected to cover all the wards assigned to you. You become annoyed at the insinuation that you have somehow neglected to do your job properly and begin to recall other instances of what you consider to be ‘harassment’ by the same colleague. On later describing the event, you recount a very negative interpretation of the disagreement, neglecting to recall any of the positive comments your colleague made about your work ethos. The distressed frame of mind during the argument meant that not only did you recall other instances of unconstructive events but your mind also worked to embed to memory only the negative elements of the interaction. What impact might the relationship between mood and memory have on the way distressed patients deal with information about their illness?

In addition to memory, the effect of emotion on attention, another aspect of cognition, has also been studied through experimental research. There is evidence of an *anxiety-related attentional bias* in certain individuals (i.e., in those who have an anxious trait, and indeed in clinically anxious patients such as those with post-traumatic stress disorder) (Braisby and Gellatly 2005). This means that anxious individuals are more likely to pay attention (depending on the experimental design) to emotional, negative or threatening words. Therefore, here researchers have suggested the existence of another vicious cycle in real life similar to that described above, where the emotion-induced *cognitive bias* then actually further impacts on emotion, reinforcing, in this example, the anxiety of the individual. Indeed, there have been some experimental attempts to reverse the effect of this bias, with some success.

Exploring the concept: the impact of emotion on attention

Imagine a patient diagnosed with type 2 diabetes, who has not been coping at all well with their diagnosis and disease management. The pharmacist conducts a Medicines Use Review, making sure to

explain the continuing need for regular eye checks, foot care and blood pressure measurements as well as ensuring a healthy diet. The pharmacist follows his normal style and attempts to reinforce his message by explaining the consequences of failing to act in accordance with his advice. If the patient is already worried, they may focus more on the negative effects of diabetes, as emphasised by the pharmacist, than on the more positive words relating to prevention or postponement of these effects. This could further affect the patient's emotional state.

The final cognitive process thought to be influenced by emotion and considered here, is that of semantic interpretation of meaning (Braisby and Gellatly 2005). Again, through experimentation, researchers have unearthed an emotional impact on cognition, in the form of an interpretative bias, where, for example, participants who are anxious might be more likely to form a negative interpretation of words that have multiple meanings. Conversely, non-anxious participants display a positive bias, leading to the concept of protective processing styles such as attribution theory and the self-serving attribution bias. Here one could argue that the existence of the positive bias has a role in helping maintain good mood and a positive self-image.

Exploring the concept: the impact of emotion on semantic interpretation

Imagine a distressed patient overhearing a dispensary conversation. The pharmacist is talking with their pre-registration trainee about red, sugar-coated tablets. The trainee mentions excipients and red dye and the pharmacist repeats 'Yes, that's a good point, definitely dye'. According to the theory linking emotion to semantic interpretation, the patient might be more likely to attach negative meanings to words with multiple meanings, if they are anxious at the time. On hearing this excerpt, the patient might hear *die* instead of *dye*.

The above examples all focus on the impact of *cognition on emotion* as an indirect and iterative consequence of bias that results from the effect of *emotion on cognition* in the social context. That is, a patient making a negative interpretation through their thought processes can experience a further negative effect on their emotion – the negative interpretation itself arising from a negative emotional state due to illness. A separate argument

relates to a more fundamental question of whether or not cognition (thought) is necessary before an emotional response is ever elicited.

Three main theories are summarised – for a recent review see Friedman (2010). First, the James–Lange theory (William James and Carl Lange) argues that emotion is a response to stimulus (i.e., behaviour precedes conscious cognition, leading to emotion), while second, the Cannon–Bard theory (Walter Cannon and Philip Bard) argues that autonomic arousal can occur in parallel to the experience of the emotion. Central to the James–Lange theory is the concept that emotion depends on the bodily reaction that follows an event, meaning different physiological signatures are required to produce different feelings. Indeed, there is some evidence to support this idea from patients with spinal injury who are unable to experience physiological changes and emotions despite the presence of emotional stimuli. Yet, Cannon and Bard were also able to provide support for their theory by citing that those with damaged spinal cords where a physiological response to stimuli is prevented, could still respond emotionally (Braisby and Gellatly 2005).

Exploring the concept: the James–Lange theory and the Cannon–Bard theory

Applying the James–Lange theory to a pharmacy situation, we might say that a patient is feeling sorry because they have just cried – or indeed that a pharmacist faced with a threatening client is scared because they have just trembled. Conversely, according to the Cannon–Bard theory, the bodily expression of the patient’s emotion (crying), governed by signals from the brain to the muscles and glands, occurs at the same time that the emotion (sadness) is felt.

A third view that contrasts both models above relates to that of Stanley Schachter and Jerome Singer, who proposed a crucial role for the cognitive appraisal of stimuli *before* the experience of emotion takes place. Schachter–Singer thus introduced the concept that cognition can control emotion. For example, they were able to demonstrate that although injecting participants with adrenaline can lead to the experience of emotion, the emotional response could also be controlled by individuals through cognitive processes and also that the experience of emotion was strongly linked to the social and physical experience of study participants. Other appraisal theorists have since shared this notion, that emotions are experienced as they are because of individual assessment of the stimuli, yet theorists have tended to suggest different sets of dimensions used by people when making such appraisals (Braisby and Gellatly 2005). For example, there are the Schachter appraisal criteria.

Exploring the concept: the Schachter–Singer theory

Imagine you are away and staying on the fifth floor of an old hotel in a room at the far end of the corridor. Exactly at midnight, you are woken up by the loud siren of the hotel's fire alarm. You will undoubtedly experience a range of emotions such as fear and anger as you try to leave your room. On the other hand, imagine the same experience. This time you have the prior knowledge that owing to a fault in the hotel's system, you should expect to hear the sound of the fire bell at exactly midnight. In fact, because of the anticipated inconvenience, your night's stay is half the normal price. With this prior knowledge, is it likely that you would experience the same range of emotions on being woken up at midnight? According to the Schachter–Singer theory, cognitive appraisal of stimuli takes place before emotion is experienced. That is, a person's interpretation (cognitive evaluation) plays a key role in determining the ensuing emotion.

Historically, Richard Lazarus, whose theories will also be discussed in Chapter 5, was a proponent of appraisal theory, and was strongly challenged by Robert Zajonc – who in turn did not believe that appraisal was a necessary precursor of emotion, sparking a debate about whether cognition precedes emotion or *vice versa*, referred to as the primacy debate (Braisby and Gellatly 2005). Although Lazarus and Zajonc were able to provide some experimental evidence in support of their individual positions on this, more recently Joseph LeDoux (cited in Braisby and Gellatly 2005) has demonstrated that both positions may be valid. LeDoux has suggested the existence of two alternative pathways in the brain taking information from the point where stimuli are perceived to where the emotional response is elicited. The first, a primitive 'lower' route, bypasses the higher brain structure and takes information from the sensory thalamus region to the amygdala via one synapse to elicit a fast emotional response; the second, a 'higher' more evolved route, while also taking the information from the thalamus to the amygdala, does this via the sensory cortex. The lower route maps on to Zajonc's ideas, whereas the higher route maps on to ideas put forward by Lazarus, enabling the moderation of emotional response via more sophisticated cognitive processes involving thought and appraisal.

Proposals relating to cognitive processes that could be used by individuals to *regulate emotional responses* also warrant brief discussion. For example, Gross and colleagues (cited in Braisby and Gellatly 2005) have contrasted *behavioural* and *cognitive* regulation, the former relating to the suppression of expressive behaviour and the latter to whether the stimulus can be attended to or interpreted in a manner that limits emotional response.

One concept relating to the cognitive regulation of emotion proposes a hypothetical continuum that has at one end attentional control and at another cognitive change (Ochsner and Gross 2005). Attentional control has examined evidence that paying less attention to stimuli can change processing in the amygdala, for example, to influence the emotional appraisal system. Here, both selective attention, focusing on a particular feature of the stimuli, and attentional distraction, limiting attention to emotional stimuli, have been studied. Evidence for attentional control of emotion does exist but it has not shed light on the exact mechanisms and context governing this regulatory effect.

Exploring the concept: the attentional control of emotion

Imagine a patient finds an unusual mole on their skin that appears to be getting larger, potentially indicating early signs of a melanoma. They visit their GP, who refers them to a specialist but that appointment is not for another two days. This delay upsets the patient enormously and they find themselves getting more and more anxious during the wait. If the patient could somehow pay less attention to their mole, would the ensuing two days would be easier to bear? Attentional control has examined evidence that paying less attention to stimuli can influence the emotional appraisal system.

In relation to cognitive change, researchers have begun asking how cognitive abilities can be ‘used to construct expectations for, select alternative interpretations of, and/or make different judgements about emotional stimuli that can change both behavioural and neural responses to them’ (Ochsner and Gross 2005). Controlled generation and controlled regulation have been examined in this context, with the latter related to cognitive change in the context of an existing or ongoing emotional response. Findings from studies examining cognitive change produce more consistent results (compared with attentional control) which has been attributed to the use of stimuli that produce strong emotional responses as well as regulatory strategies that engage regulatory processes in a clear strong manner.

Exploring the concept: the cognitive control of emotion

Imagine again the same patient as above, with the problematic mole. What is the negative interpretation that is leading to the patient’s emotional reaction and what other plausible explanations are there? The discovery of an unusual mole does not equal a terminal prognosis.

What if the patient could be taught to make a different, more balanced interpretation of their symptoms?

It becomes apparent from reviewing the available evidence, not only that cognition and emotion are interlinked, but also that there is a scientific basis for using cognitive and behavioural strategies to influence emotion. This provides a basis for understanding some of the behaviour-change models such as cognitive behaviour therapy, now recommended by the UK health service for dealing with negative interpretations of illness and disease. In fact, in this book cognitive techniques are referred to in the context of better communication in Chapter 6.

Conclusion

People's thoughts and decision making can depend on their ideas about the world and even their emotional state. The way that people think about the world can help them make more efficient decisions or it can hinder the decisional outcome through erroneous thinking. Sometimes people are motivated to think about matters in a way that preserves their sense of self. This could be particularly important in the context of health, where people's emotions will be embroiled in their thought processes. People's emotional state can affect their memory, attention and construction of meaning, impacting in turn on their decision making. Thoughts too can influence people's emotions, with people making an assessment about an event before forming an emotional response. This provides the basis for teaching people the skills to direct their thoughts in more productive ways. While this chapter has examined some fundamental concepts relating to thought and decision making, the next chapter examines health beliefs and behaviour-change models in relation to health (or health-damaging) behaviours.

Sample examination questions

Students may wish to use the following sample questions to aid their learning and revision before examinations:

- 1 Describe the availability and the representativeness heuristics, using examples to illustrate your answer.
- 2 Give a definition of cognitive bias associated with the use of heuristics, describing three types of bias in your answer.
- 3 Summarise your understanding of attribution theory.

- 4 Justify the importance of the emotion–cognition relationship.
- 5 Contrast normative ideas with heuristics-based ideas in relation to decision making.
- 6 To what extent can emotion affect thought processes?
- 7 Defend the idea that thought can be used to control emotion.

References and further reading

- Bornstein BH, Emler AC (2001). Rationality in medical decision making: a review of the literature on doctors' decision-making biases. *Journal of Evaluation in Clinical Practice*, 7: 97–107.
- Braisby N, Gellatly A (2005). *Cognitive Psychology*. Oxford: Oxford University Press.
- Buchanan K *et al.* (2007). Perceiving and understanding the social world. In: Miell D *et al.*, eds. *Mapping Psychology*. Milton Keynes: The Open University, 57–104.
- Chase VM *et al.* (1998). Visions of rationality. *Trends in Cognitive Sciences*, 2: 206–214.
- Friedman BH (2010). Feelings and the body: the Jamesian perspective on autonomic specificity of emotion. *Biological Psychology*, 84: 383–393.
- Gigerenzer G, Gaissmaier W (2011). Heuristic decision making. *Annual Review of Psychology*, 62: 451–482.
- Izard CE (2009). Emotion theory and research: highlights, unanswered questions, and emerging issues. *Annual Review of Psychology*, 60: 1–25.
- Klein JG (2005). Five pitfalls in decisions about diagnosis and prescribing. *BMJ*, 330: 781–784.
- Miell D *et al.* (2007). *Mapping Psychology*. Milton Keynes: The Open University.
- Ochsner KN, Gross JJ (2005). The cognitive control of emotion. *Trends in Cognitive Sciences*, 9: 242–249.
- Thornton JG *et al.* (1992). Decision analysis in medicine. *BMJ*, 304: 1099–1103.
- Tversky A, Kahneman D (1974). Judgment under uncertainty: heuristics and biases. *Science*, 185: 1124–1131.