NORMAL WAKING CONSCIOUSNESS AND ALTERED STATES OF CONSCIOUSNESS

Consciousness relates to our awareness of our thoughts, feelings, perceptions and surroundings at any ONE moment in time. It creates our reality (what we believe to be real) and our sense of self. This chapter examines different states of consciousness – from when you are alert, to being not fully aware or even lacking awareness altogether. Consciousness can deliberately be altered through activities such as meditation and the use of drugs such as alcohol, or it can be altered naturally through activities such as daydreaming and sleep.

KEY KNOWLEDGE

Concepts of normal waking consciousness and altered states of consciousness, including daydreaming and alcohol-induced, in terms of levels of awareness, content limitations, controlled and automatic processes, perceptual and cognitive distortions, emotional awareness, self-control and time orientation.

(VCE Study Design 2013)
States of consciousness

**CHAPTER OVERVIEW**

<table>
<thead>
<tr>
<th>Normal waking consciousness</th>
<th>Characteristics of normal waking consciousness</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Level of awareness</td>
</tr>
<tr>
<td></td>
<td>Content limitations</td>
</tr>
<tr>
<td></td>
<td>Attention</td>
</tr>
<tr>
<td></td>
<td>Controlled and automatic processes</td>
</tr>
<tr>
<td></td>
<td>Perceptual and cognitive distortions</td>
</tr>
<tr>
<td></td>
<td>Emotional awareness</td>
</tr>
<tr>
<td></td>
<td>Self-control</td>
</tr>
<tr>
<td></td>
<td>Time orientation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Altered states of consciousness</th>
<th>Characteristics of altered states of consciousness</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Level of awareness</td>
</tr>
<tr>
<td></td>
<td>Content limitations</td>
</tr>
<tr>
<td></td>
<td>Controlled and automatic processes</td>
</tr>
<tr>
<td></td>
<td>Perceptual and cognitive distortions</td>
</tr>
<tr>
<td></td>
<td>Emotional awareness</td>
</tr>
<tr>
<td></td>
<td>Self-control</td>
</tr>
<tr>
<td></td>
<td>Time orientation</td>
</tr>
<tr>
<td>Daydreaming</td>
<td>Why is daydreaming considered to be an altered state of consciousness?</td>
</tr>
<tr>
<td>Alcohol-induced states</td>
<td></td>
</tr>
</tbody>
</table>

Are you conscious? If you are reading this, the answer is most definitely yes! You probably already have a good idea about the meaning of the word ‘conscious’ and, indeed, the word ‘unconscious’. In everyday conversation, we tend to use ‘conscious’ interchangeably with the word ‘aware’. For example, how aware are you at this moment? Your answer is likely to include how alert you feel, what you are currently thinking, what emotions you are experiencing, what sensations you perceive and what you are noticing about your surroundings. Your answer is obviously very subjective – it depends on what you are experiencing at this point in time and is often difficult to describe to others as well as being difficult for others to completely comprehend your experience. Studying conscious is complex and presents a number of challenges.
The chapter begins with a brief introduction to consciousness. In the rest of this chapter, we will explore the notion of normal waking consciousness and compare it to altered states, with particular focus on daydreaming and alcohol-induced states. In later chapters, we will discuss sleep and link consciousness to cognitive processes and the role of the brain.

**SUPPORTING UNDERSTANDING**

**What is consciousness?**

Consciousness can be defined as the awareness of our own thoughts, feelings and perceptions (internal events) and our surroundings (external stimuli) at any given moment. It includes all the experiences that we are consciously aware of at any particular time. It creates our reality (what we believe to be real and happening at this moment) and is central to our sense of self. Our sense of self is developed through being aware of what we are doing, why we are doing it and the awareness that others are probably observing, evaluating and reacting to what we are doing. Take a look around you. Can you describe your surroundings? Are you aware of what is going on in your environment? How do you feel about it?

Others cannot directly know what you are thinking, feeling or perceiving, and most of us have some difficulty conveying our thoughts, feelings and perceptions to others. Our own conscious experience is personal and private, and it is difficult to measure accurately or compare with other people’s.

**States of consciousness**

Right now you are paying attention to the words on this page, but what were you focusing on a moment ago? Maybe you were daydreaming, making plans for the weekend or waking up from sleep – or were you arguing with your parents? All these different mental activities represent different states of consciousness.

Our level of awareness of internal events and external surroundings varies throughout the day. You will have times when you are alert (such as during your psychology class, of course!) and others when you are feeling quite drowsy. Consciousness can be thought of as operating on a continuum from a high level of consciousness or awareness through to the point of being unconscious (being totally unaware). The more aware we are of our thoughts, feelings, perceptions and surroundings, the higher the level of consciousness. The level of awareness of internal events and external surroundings is known as a **state of consciousness (SOC)**.

**Early psychology**

William James (1842–1910), a great American psychologist, wrote one of the most influential psychology textbooks, *Principles of Psychology*, in 1890. It took almost 12 years to write and is still widely read in print and online today.

William James was trained as a medical doctor and initially taught physiology and anatomy at Harvard University. He drifted into psychology and pioneered a psychology course. He ended his career studying philosophy. Like Descartes, he was religious. James believed that it was too simple an idea to infer that small changes in the brain cause complex human behaviours and called this idea ‘psychology without a soul’. 

**FIGURE 2.1** American psychologist William James (1842–1910)
James studied the conscious experience. He loved fishing, and was supposedly at his favourite fishing spot when he created the analogy of consciousness with a stream. He noted that our conscious experience is unbroken and continuous, despite constantly shifting and changing. James coined the phrase ‘the stream of consciousness’ and viewed consciousness as an ever-changing stream of thoughts that can shift smoothly and effortlessly from one moment to the next, just like water flowing in a stream.

According to James, our conscious experience:
- is continuous: it is never empty; thoughts are not isolated and can flow easily from one topic to another without interruption
- is ever-changing: it rarely travels along one line of thought and constantly changes as we become aware of new information
- is a highly personal experience: it relies on our own thoughts, feelings and perceptions
- is selective: we can usually choose to focus on some things and ignore others; we can focus on internal events (thoughts, feelings and perceptions) and/or external surroundings
- is active: consciousness has a purpose to allow us to function in our world.

‘Consciousness … does not appear to itself chopped up into bits … a “river” or a “stream” are the metaphors by which it is most naturally described … as the brain changes are continuous so do all these consciousnesses melt into each other like dissolving views. properly they are but one protracted consciousness, one unbroken stream.’

William James (1890)

When you looked out of the window earlier, you might have focused initially on the question. You were conscious of the question and thought of the type of animals that could be outside. Maybe you wondered about what they could be doing (eating, following each other around, fighting). Your consciousness might then have shifted to a conversation you had at recess with a friend. Then you might have wondered what you would buy at the canteen to eat for lunch. Next, you could have focused on the other students in the class to see if they were still looking out the window. Then a thought about how uncomfortable your shoes were might have crossed your mind. Finally, you might have wondered what the original question was again and tried to focus on zoo animals! In the above scenario, your consciousness focused on internal and external events and consisted of an ever-changing stream of thoughts that shifted from one moment to the next with relative ease. It drifted along the stream at different paces.

James’ work on consciousness is still highly regarded by many as having a tremendous impact on psychology. There has been a resurgence of studying human consciousness since the 1960s and today it is generally accepted that the human mind (consciousness) is a characteristic of being human and that without the brain consciousness is not possible. Consciousness pinpoints a large difference between computers and humans. We can focus our attention on events, such as becoming consciously aware of our thoughts and feelings, or we can look outwards and become consciously aware of our environment. Computers lack this ability; they cannot understand what is happening in the same manner as we do. Essentially, being human encompasses the complexities of our mind, brain and body, the title of Unit 3, Area of Study 1.
Normal waking consciousness

Think about how aware you are of your thoughts and feelings and what is happening around you at the moment. You have a real understanding of where you are, what time it is, what you are thinking, how you are feeling and who you are with. That is, you are experiencing normal waking consciousness – a state that is relatively organised, meaningful and clear. **Normal waking consciousness (NWC)** can be loosely defined as the states of consciousness you experience when you are awake and aware of your thoughts, feelings and perceptions from internal events and the surrounding environment. During normal waking consciousness, you experience a real sense of time and place. Your experience during normal waking consciousness creates your reality and provides a baseline from which to judge all other states of consciousness.
Throughout the day, and even throughout a lesson, your level of awareness will vary. You may focus intently on reading your textbook but later feel a bit drowsy and find yourself distracted by noise in the corridor outside. These changes are part of normal waking consciousness.

Characteristics of normal waking consciousness

The following characteristics help determine whether you are experiencing normal waking consciousness.

**LEVEL OF AWARENESS**

*Awareness* relates to how conscious or aware you are of internal (within your body) and/or external (within your environment) events. A number of levels of awareness exist during normal waking consciousness. It is not unusual to swap ‘consciousness’ with the term ‘awareness’ since they are linked together. Your level of awareness influences the other characteristics of consciousness.

Different levels of awareness can be viewed as a *continuum of awareness*, ranging from deep unconsciousness to heightened awareness, as shown in Figure 2.4. Normal waking consciousness tends to occupy middle part of the continuum (the awake to alert zone), with reduced awareness as an altered state of consciousness below and heightened awareness as an altered state of consciousness above.

![The continuum of awareness](image)

**FIGURE 2.4** The continuum of awareness
LEVELS OF AWARENESS

Study the following pictures. Place the pictures in an order along a continuum, from total awareness to complete lack of awareness. Are some easier to place on the continuum than others? Explain.

INVESTIGATE 2.2

CONTENT LIMITATIONS

During normal waking consciousness, we mainly control what we focus our attention on, and our thoughts tend to be organised and logical. For instance, to read this page you must focus your attention on the page and be able to see the print. You need to think logically and limit your attention to what is written in order to fully understand. The content (type of information) of normal waking consciousness is therefore generally more limited (restricted) than the content of consciousness during an altered state. Our thoughts tend not to be as creative, bizarre, unrealistic or impossible compared to our thoughts during an altered state of consciousness.

ATTENTION

Try this: sit quietly in your seat. Think about the information you are sensing from your environment. What do you perceive? Now, focus on the pressure on your feet from your shoes. Can you feel the pressure? What about the pressure on your bottom from sitting on your seat? It is likely that you were not consciously aware of the pressure before reading this – the book prompted you to attend consciously to this information.
At any given time, an enormous amount of information is available from our senses, memories and other cognitive processes. It is impossible to attend to all of this information, and your attention can be focused on events that are taking place in the environment (external) or inside our minds (internal) and attention can shift consciously or unconsciously.

Attention relates to the information that you are actively processing, either consciously or even outside your conscious awareness. Attention overlaps with consciousness, as what you are consciously aware of is often also the focus of attention. For example, try recalling what you ate for dinner last night. The answer requires attention in order to reach your conscious awareness. Another example, such as typing your name on a keyboard, is likely to require little conscious awareness. In this case, you are actively processing the task but not at a conscious level.

A range of stimuli can attract our attention, including:
- novel stimuli (such as something new or unusual),
- changes in stimulation (such as the volume on a radio suddenly increasing), and
- something that is personally meaningful to us (such as our name being mentioned across a crowded room) or important to us to attend to at the time.

ARE YOU PAYING ATTENTION?
Go to The Awareness Tests UK website. View the video clip ‘Basketball Awareness Test’ and follow its instructions.

1. Did you get the correct answer? How many members of your class got the correct answer?
2. Was your attention limited while watching the clip? Why?
3. Link your experience to content limitations and attention in normal waking consciousness. Was the information in your consciousness limited to what you were paying attention to?

Attention may be broadly classified into the following types:

A: Selective attention
Content limitations during normal waking consciousness are due mainly to selective attention. Selective attention refers to the limitations placed on how much we can focus at any given moment on one stimulus or event to the exclusion of others. It is usually difficult to attend to more than one event at the same time. Therefore you may not notice (consciously attend to) other events happening at the same time.

B: Selective inattention
We can also avoid attending to information that may be relevant but emotionally upsetting. This is known as selective inattention. Diverting our attention away from our consciousness can be helpful (such as trying not to think about how nervous you are about a SAC) or unhelpful (such as trying to ignore a bad cough that may turn into pneumonia).

C: Divided attention
At the top of the consciousness continuum (higher level of awareness), a higher level of attention is required and this tends to be selective. As you move down the
Divided attention refers to the capacity to attend to and perform two or more activities at the same time. This is generally only possible if the tasks can be performed with very little mental effort. For example, we can talk as we walk or type as we read. However, divided attention has its limits. It is harder to perform two or more tasks simultaneously when they require similar mental skills and more than one is a complex (controlled) process.

For example, have you ever been on the telephone and engaged in a conversation with someone in the room at the same time? A conversation requires your full attention and doing both similar and complex tasks at once is difficult. You need to shift your attention back and forth between both tasks — it is likely you cannot do both at the same time. If you try to do this, the person on the phone will probably realise that you are not paying full attention to their conversation. Divided attention is not possible.

In summary, performance on tasks that require divided attention is usually poorer when:
- the tasks are similar,
- are not well-practised, and
- are difficult or complex.

How can psychologists study divided attention?
Psychologists have used a range of techniques to study attention including dichotic listening tasks. A well-known experiment that tested divided attention was conducted by Shaffer (1975). We cannot fully attend to two separate messages delivered simultaneously through two earphones. Proficient typists performed a test in which
they had to type the information being presented via headphones in one ear while performing a second task at the same time. This second task included two different conditions:
- condition 1: a shadowing task in which unrelated information was presented via headphones to the other ear. The typist had to say aloud the information presented in this ear.
- condition 2: a reading task in which the typist had to read aloud visual information that was presented to them.

In both cases, the typists’ performance on the test was poorer compared to their performance when carrying out the three tasks separately. Shaffer suggested that performance was poorer because of the similarity of the tasks. In the first condition, the material was similar in the way it was presented (a listening task) and thus interfered with the ability to receive the auditory information. The second condition interfered with the typists’ ability to produce the typed information – both required verbal and written skills.

There have been some dichotic listening studies that have reported astonishing findings of people being able to carry out two tasks at once extremely well. Skilled pianists (Allport et al. 1972) were asked to sight-read music while listening to continuous speech (shadowing task). The pianists’ music performance was not affected by the shadowing task.

**Do we only process information we consciously attend to?**
Active processing of information can take place outside our conscious awareness. Have you ever been deeply engrossed in a conversation and tuned out to everything else that is happening in the room? Suddenly, you hear your name mentioned across the room and you immediately look up and focus on the person who spoke your name. This is known as the _cocktail party phenomenon_ and shows that much more information is processed in our consciousness than that to which we initially attend. Therefore, consciousness may not be limited to what you are attending to at the time.
SUPPORTING UNDERSTANDING

Change blindness

Change blindness is a failure to notice a large change that takes place in full view in a visual scene. Change blindness takes place when the change is simultaneous with some kind of brief disruption in vision.

Change blindness is a recent discovery and area of interest for cognitive psychologists. It initially appears to be a simple phenomenon but the reasons why it occurs are complex and are being investigated and debated. Currently, the most accepted theories relate to attention and memory. Often we think that there has been a change but cannot remember exactly what the change is, even though the change is significant. This is likely to relate to poor memory of the initial scene.

Change blindness is not inattentional blindness! Both terms are related but they are different phenomena.

Change blindness is when significant changes in the visual world go unnoticed, while inattentional blindness is when entire objects or events go unnoticed without a visual disruption or significant change from one scene to the next. Revisit Investigate 2.3 Are you paying attention? – this is an example of inattentional blindness because attention (selective attention) was on another event, not on the unnoticed and unexpected event.

Change blindness depends on failure to store the memory of a scene in the first place, or failure to compare the memory from one scene to the next. Inattentional blindness does not rely on memory – it is the failure to detect an unexpected object or event that is fully visual on one visual scene.

Are you susceptible to change blindness? Search online for and carry out at least two tests of change blindness.

CONTROLLED AND AUTOMATIC PROCESSES

As someone who has been writing for years, when you write a sentence you pay attention to the meaning of the sentence or the spelling of a word rather than the process of forming (drawing) each letter. The act of writing each letter or word is automatic, with little mental effort or conscious awareness. Automatic processes require very little awareness or little mental effort to be performed well and they generally don’t interfere with other automatic or controlled processes. In other words, automatic processes require little attention and little thought and can allow you to do two things at once. Automatic processes become procedural memories (discussed in Chapter 9).
Another example of an automatic process is texting on a mobile phone. Many people are well-practised and know exactly where the buttons are, so can create the message with ease. For them, texting is a simple task that requires little mental effort.

Compare this to someone who is learning how to write text messages. The person must concentrate on how to create the message – it requires their full attention. For this person, texting is a complex task as it is yet to be learnt or mastered and requires greater mental effort. It is an example of a controlled process. Controlled processes require full awareness and mental effort to focus attention on the required task. This person needs to be consciously aware of what they are doing and think about doing the task. They are unable to complete another controlled process at the same time as both require full attention and therefore will interfere with each other.

Learning how to drive provides a very good example of how an activity can become automatic. At first, you can feel awkward and experience difficulties monitoring your hands and feet, especially if you are learning to drive a manual vehicle. At this stage, operating the car requires your full attention because it is a controlled process. You might even find it hard to talk to your instructor or read road signs. As your skills develop, you will find it easier to steer, indicate, check the rear-view mirror and change gears. Finally, you will find yourself doing these things automatically and be able to concentrate on the traffic and other driving conditions. The basic skills of driving the car are now automatic processes.

Think about your favourite elite athlete or musician. Through years of practice, they have learnt to perform extremely complex skills with minimum conscious awareness, as controlled processes have become automatic. These people will probably tell you that thinking too much about the automatic task can actually hinder performance. In fact, talented American baseball player, Yogi Berra, summed this up in his well-known statement, ‘You can’t think and hit at the same time.’

Attention relates to our ability to undertake controlled and automatic processes.

- Controlled processes require selective attention – a person must actively focus attention in order to successfully complete the task.
- Automatic processes enable us to have divided attention – if a task requires little mental effort and attention, we can often engage in other tasks at the same time.
### TABLE 2.1 The differences between automatic and controlled processes

<table>
<thead>
<tr>
<th></th>
<th>AUTOMATIC PROCESS</th>
<th>CONTROLLED PROCESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount of conscious awareness</td>
<td>Requires little, if any, conscious awareness</td>
<td>Requires full conscious awareness</td>
</tr>
<tr>
<td>Attention</td>
<td>Requires little attention or mental effort (enables us to have divided attention)</td>
<td>Requires selective attention (must actively focus attention on the task)</td>
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<tr>
<td>Task difficulty</td>
<td>Simple (easy) or mastered tasks</td>
<td>Usually complex (difficult) or novel (new or yet to be mastered) tasks</td>
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</tbody>
</table>

### MEDIA RESPONSE: ON THE PHONE? GET OFF THE ROAD!

The use of mobile phones, either hand-held or hands-free, is banned for L-plate and P1-plate drivers. It is also illegal for all drivers to touch a mobile phone while in control of a motor vehicle, even when stopped at traffic lights.

Go to the TAC website. Search for, download and read the brochure 'Let's talk mobile phones and driving'.

Is this law fair? Is driving while using a mobile phone dangerous? Obviously, physically touching a mobile phone is dangerous – a driver has to take a hand off the steering wheel and eyes off the road. Therefore, it is physically impossible to carry out the tasks simultaneously. But what about the use of hands-free mobile phones for inexperienced drivers?

Prepare a supporting document that justifies the banning of mobile phones while driving laws. Outline the laws and the reasons for implementing them. Using psychological terms, relate your argument to the relevant characteristics of normal waking consciousness.

What other laws exist that are applicable for inexperienced drivers only? Can these laws be justified using the same psychological reasoning? Discuss.

### PERCEPTUAL AND COGNITIVE DISTORTIONS

**Perception** is the process of organising sensory input and giving it meaning. During normal waking consciousness, our perceptions are usually clear and rational. We can make sense of sensory input and have a real awareness of our internal state and any external stimuli.

**Cognition** is a broad term that relates to mental activities such as thinking, problem solving, language and reasoning. During normal waking consciousness, we have a sense of reality. Our thoughts are usually rational, clear and meaningful. We are capable of cognition – i.e. problem solving, analysis and reasoning.

During normal waking consciousness, the brain actively stores information in memory and retrieves it from memory for use in thinking. Memory is a vital component of normal waking consciousness as it is involved in nearly every activity we undertake. We can generally access our memories and remember events and
experiences processed into long term memory in this state. We will discuss the importance of memory in more detail in Chapter 8.

**EMOTIONAL AWARENESS**

During normal waking consciousness, we are generally aware of our feelings and show a range of emotions that are normal for us and appropriate for the situation. We can usually monitor our emotions and even hide our true feelings from others.

**SELF-CONTROL**

Consciousness allows us to direct our thinking and monitor our impulses and behaviours. During normal waking consciousness, our ability to maintain self-control is usually maintained. We can plan and monitor what we say and do. We tend to be quite reserved and avoid doing anything that we think is risky or embarrassing.

**TIME ORIENTATION**

During normal waking consciousness, we usually have a good awareness of the passage of time. Time is perceived as moving at the ‘real’ time. For example, when it feels as if 10 minutes has passed, about 10 minutes has actually passed. We understand where we are in time (night or day, year and hour) and are able to focus on the past, present and future.

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**Questions**

1. Where does normal waking consciousness tend to lie on the continuum of awareness? Where are you more likely to find an altered state of consciousness?
2. a. Define ‘normal waking consciousness’.
   b. Are there different states of consciousness within normal waking consciousness? Explain your answer.
3. Think of a task that you find easy to perform. Does this task require selective attention? Explain your answer with references to controlled and automatic processes.
4. In terms of self-control, how do we tend to behave during normal waking consciousness?
5. In terms of controlled and automatic processes, explain why learner drivers must log 120 hours of supervised driving time.

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**Altered states of consciousness**

During normal waking consciousness, we experience a real sense of time and place. We understand where we are, what we are doing, when we are doing it and why we are doing it. If we deviate from the normal baseline, we experience an altered state of consciousness (ASC). Therefore, an altered state of consciousness can be defined as any state of consciousness that deviates from normal waking consciousness, in terms of marked differences in the level of awareness, perceptions, memories, thinking, emotions, behaviours and sense of time, place and self-control. As such, this could include states produced by the learnt technique of meditation, psychological drugs (including alcohol), fever, psychosis (a serious condition where the sense of reality is
lost) and even daydreaming and sleep. Altered states are often culturally significant and can happen through religious experiences. An altered state of consciousness can be induced deliberately or occur naturally.

**RESEARCH INVESTIGATION: SHEEP DASH! GAME**

Search for the Sheep Dash! game on the BBC website. It measures your reaction time. Your level of alertness depends on your state of consciousness at the time and therefore will affect your reaction time.

Play this game under different conditions, e.g. at a time when you:
- are drowsy (e.g. after lunch or on a hot afternoon)
- are alert (e.g. mid-morning)
- have woken up during sleep (e.g. set the alarm clock for 3 a.m.)
- have recently had caffeine or sugary food (e.g. chocolate).

Before playing the game, rate your state of consciousness by completing the information in a table like the one below.

To measure awareness, use the scale: 1 = asleep, 2 = drowsy, 3 = relaxed, 4 = intense, 5 = hyper-aroused.

To measure heart rate, tilt your head up and place two fingers against the carotid artery on one side of your neck. Count the pulses for 30 seconds, then multiply this by two to get the number of beats per minute.

Other physiological measurements such as body temperature, blood pressure and respiration rate may also be measured.

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**Questions to consider:**

1. Under what condition[s] was your reaction time the fastest? Slowest?
2. Did you find evidence that your level of awareness influenced your reaction time?
3. Was there an association between your level of awareness and your heart rate?
4. What are *order effects* and how could order effects influence your results? (See Chapter 1)
5. Were there any environmental conditions (potentially confounding variables) that may have affected your performance during one of the trials?
HOMER’S ALTERED STATE OF CONSCIOUSNESS

Probably the easiest way to understand the characteristics of normal waking consciousness is to consider the characteristics of altered states of consciousness.

Watch the first five minutes of The Simpsons Season 14 Episode 2: ‘How I spent my Strummer Vacation’.

1. Make a list of the various ways Homer tried to alter his state of consciousness. Categorise these altered states of consciousness as drug-induced or non-drug-induced.

2. List the various effects that Homer experienced while in an altered state of consciousness. Categorise these changes in terms of:
   > perception – sight, hearing, smell, taste, touch
   > thinking – including problem-solving, reasoning and understanding
   > memory
   > emotions
   > behaviours – including self-control, coordination, balance and speech
   > perception of time – e.g. understanding the amount of time that has passed
   > awareness of the environment.

3. Discuss how these changes in an altered state of consciousness compared with the characteristics of normal waking consciousness.

Characteristics of altered states of consciousness

Think of a time when you were sick with a high fever. What did you experience? Did you lose track of where you were and what was happening around you, your sense of time and the ability to think clearly?

Now think of a time you have been at a party with lots of people, loud music and flashing lights. Did you ‘absorb’ yourself into the scene? If so, did the time fly? Were you extremely happy and less inhibited than usual? If you answered yes, then you experienced an altered state of consciousness. You don’t need drugs to deliberately alter your state of consciousness; an environment such as this one can do it for you.

Let’s look briefly at the characteristics of an altered state of consciousness.

LEVEL OF AWARENESS

Look back at the continuum of awareness (Figure 2.4). In an altered state of consciousness, your level of awareness either decreases or increases compared with normal waking consciousness. You become more or less aware of your perceptions and/or surroundings. When suffering from a fever, for example, you become less aware of what is happening in your environment. If you are experiencing heightened awareness, you can become more aware of certain events that are happening around you.

FIGURE 2.9 Being sick with a fever is an example of an altered state of consciousness.
CONTENT LIMITATIONS

Your ability to pay attention to certain tasks can be increased or decreased compared with normal waking consciousness. In normal waking consciousness you can usually prevent yourself from focusing your attention on issues, thoughts or events that are unpleasant. During an altered state of consciousness, whether it is naturally occurring (such as sleep) or artificially induced (such as by drugs), your mental defences are lowered and the content of your thoughts and dreams may be both broader and deeper than in normal waking consciousness. The content of your consciousness when in an altered state of consciousness is often disorganised and senseless or bizarre and unusual or to the other extent, extremely narrow (limited) as you concentrate intently on one thing.

Tasks that require selective attention may be impaired. It can also be very difficult to divide attention, even between automatic processes.

CONTROLLED AND AUTOMATIC PROCESSES

In an altered state of consciousness, you usually find it difficult to carry out controlled processes. Your ability to perform some automatic processes can also be impaired. In some altered states of consciousness, however, you may be so focused (high level of awareness) that you find some tasks easier.

PERCEPTUAL AND COGNITIVE DISTORTIONS

Your perception of sensory input is often quite different in an altered state of consciousness compared with that experienced during normal waking consciousness. For instance, you may perceive colours as being more vivid or duller than how you see them during normal waking consciousness. You might not perceive pain or you might have a stronger reaction to it. Vision, hearing, touch, taste, smell and balance can all be affected in an altered state of consciousness.

There is a tendency for cognitive functions to become distorted during an altered state of consciousness. Thoughts may become disorganised, as evidenced during some dreams. Thinking may lack logic and problem-solving may be impaired. The memory of events that occurred during an altered state of consciousness might not be accurate and you might not even be able to recall them at all during normal waking consciousness. Furthermore, we may have difficulty remembering things that we normally remember in normal waking consciousness, such as a good friend’s name or our telephone number.

EMOTIONAL AWARENESS

The way emotions are experienced is often different during altered states of consciousness.

Emotions can be heightened. This means they can become more intense, such as being much happier or sadder.

Emotions can be dulled to the extent that people feel emotionally numb. This can happen, for example, when someone is in a state of shock following a crisis or personal tragedy.

Emotions might also be inappropriate. There can be a lack of understanding of the emotional reality of the situation and a person can experience an inappropriate emotion.
**SELF-CONTROL**

Your ability to maintain self-control is often reduced during an altered state of consciousness. Your inhibitions are lowered and you might do things you would not do during a normal state of consciousness. You might be more open to suggestion, meaning that you are more likely to follow instructions with little resistance or thought about the consequences. However, this is not always the case; some people gain greater self-control in certain altered states of consciousness.

**TIME ORIENTATION**

Time tends to be experienced at a different speed when in an altered state of consciousness. For example, when woken from sleep after just one hour, you may be surprised that you haven’t yet had an entire night’s sleep. On other occasions, you can’t believe that a whole night has passed when the alarm sounds to herald the start of another day of school. It may seem that you have only been asleep for an hour or so.

### TABLE 2.2 Comparisons between normal waking consciousness and altered states of consciousness

<table>
<thead>
<tr>
<th>CHARACTERISTIC</th>
<th>NORMAL WAKING CONSCIOUSNESS (NWC)</th>
<th>ALTERED STATE OF CONSCIOUSNESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of awareness</td>
<td>Awake and generally aware of internal and external events. A good sense of place, time and reality.</td>
<td>May be increased or decreased compared to NWC. Most often, level of awareness is lowered during an altered state but can be increased when a person experiences heightened awareness.</td>
</tr>
<tr>
<td>Content limitations</td>
<td>More constrained and controlled. Can selectively process different parts of what is in consciousness.</td>
<td>May be more or less than in NWC. Usually less constrained or controlled, with reduced ability to process information but fewer limitations on content.</td>
</tr>
<tr>
<td>Controlled and automatic processes</td>
<td>Able to perform controlled and automatic processes, within normal limits. Attention is focused or highly selective and can be divided between tasks.</td>
<td>Usually less (although sometimes more) able to perform controlled processes and automatic processes. Usually less control over attention, which may be highly selective, but less able to be divided between tasks.</td>
</tr>
<tr>
<td>Perceptual and cognitive distortions</td>
<td>Perceptions (including pain) are realistic and normal. Effective control of memory processes: storage and retrieval. Thought processes are organised and logical.</td>
<td>Perception (including pain) may be altered. Memory processes may be disrupted or distorted: storage and recall may be more fragmented or less accurate. Thought processes are disorganised and less logical.</td>
</tr>
<tr>
<td>Emotional awareness</td>
<td>Greater awareness of emotions and control of emotional awareness.</td>
<td>Less (although sometimes more) control of emotions, e.g. more or less affectionate, aggressive, anxious.</td>
</tr>
<tr>
<td>Self-control</td>
<td>More control over actions and movements, e.g. you are able to make yourself walk in a straight line.</td>
<td>Usually less control over actions and movements, e.g. not able to make yourself walk in a straight line. Less control over emotions and thoughts but greater susceptibility to suggestion may decrease self-control.</td>
</tr>
<tr>
<td>Time orientation</td>
<td>Clear sense of time: e.g. the passage of time, including past, present and future.</td>
<td>Distorted ‘sense’ of time, e.g. time may appear to speed up or slow down.</td>
</tr>
</tbody>
</table>
Our experiences in various altered states of consciousness differ remarkably from each other. The rest of this chapter takes a closer look at specific examples, including daydreaming and alcohol-induced altered states of consciousness.

**Daydreaming**

We *daydream* when we shift attention to our private thoughts, feelings and imagined scenarios, and daydreaming is regarded as an altered state of consciousness. Daydreams tend to be visualized thoughts that are usually positive and pleasurable.

We can daydream at any time. However, we are more likely to daydream when we are alone, stationary or in boring or routine situations. Often we daydream when we are waiting to fall asleep. Think of times when you have daydreamed – has it been during one or more of these situations?

Daydreams occur naturally and often we don't realise that we are daydreaming. Think of a time when you have been daydreaming and someone has had to ask you two or three times to 'snap out of it'. You probably didn't realise that you were ‘in another world’.

We spend an enormous amount of time daydreaming – anywhere from a third to a half of our waking life. Daydreaming tends to take place in 90-minute cycles (Krippke & Sonnerschein 1973). In one study, Klinger (1978) monitored the thoughts of a number of people. Half of these thoughts were daydreams because they were fanciful, unconnected to the activity the person was completing, or both. He found the median time for each thought was 5 seconds, with the mean being 14 seconds, although many thoughts were longer than this. Extrapolating these results to someone who is awake 16 hours a day (therefore spending 8 hours asleep), that person experiences around 2000 daydreams per day (around 7 ¼ hours per day!).

Daydreaming is experienced throughout the lifespan, although it appears to be less frequent as we get older. In a large, 24-year longitudinal study, it was noted that, with age, there was a decrease of the frequency and intensity of daydreams in adulthood, with females showing greater decline (Giambria 1999).

Consider a time when you experienced each of the following:

→ being sick with a high fever
→ being at a party with lots of people, loud music and flashing lights.

1. For each experience, describe the characteristics of consciousness you experienced in terms of:
   a. your level of awareness
   b. your ability to perform controlled and automatic processes
   c. your content limitations
   d. your cognitive and perceptive distortions
   e. your emotional awareness
   f. your self-control
   g. your perception of time.

2. Do you think these experiences are examples of altered states of consciousness? Justify your answer.
Daydreaming has been associated with good mental health and stability. In one study, people who reported they took control of most of their daydreams tended to be in better psychological health than those who rarely took control (Lapidos 2008). Daydreams may also offer an insight into our personality, motives and concerns. By studying their nature and content, daydreams may provide a pathway to recognising and understanding a person’s personality, motivation, fears and concerns.

There is some concern that modern technology is limiting our daydreaming time and perhaps our ability to think creatively. For example, while watching television and playing multimedia games keeps us entertained, we often become ‘glued’ to the screen and therefore tend not to daydream.

Most of us accept that daydreams are a normal part of life, although many people see daydreaming as a negative event. For example, have you ever been in trouble for daydreaming? Considering the list of the positive effects of daydreaming (see the Did you know? section opposite), it seems clear that daydreams are not necessarily the waste of time our society might suggest. ‘Zoning out’ can have benefits — spontaneous thoughts can make us feel vibrant, aware and engaged.

**WHY IS DAYDREAMING CONSIDERED TO BE AN ALTERED STATE OF CONSCIOUSNESS?**

Just like sleep, daydreaming is a natural and common phenomenon that we all experience. The characteristics of daydreaming include:

- **a lowered level of awareness**, especially of what is happening in our surrounding environment
- **fewer content limitations.** We can have bizarre, uncommon or unrealistic thoughts that don't need to be bounded by reality. Some serial killers have reported more frequent, recurring, violent fantasies before committing a murder. With daydreams, we can focus on one line of thought but the amount of control over what you want to attend to is decreased as your mind wanders off with other thoughts. This makes selective attention very difficult
- **difficulty performing controlled processes.** Our ability to effectively perform two or more tasks at once is lowered, if not possible, and controlled or difficult tasks are hampered. Daydreaming while driving can lead to accidents
- **likely perceptual and cognitive distortions.** Daydreaming in class may prevent us from learning about the content material, especially if we are daydreaming about something entirely different. Daydreaming decreases our awareness of our surroundings, so understanding what the teacher is saying at the same time is unlikely. Our perceptions can also be distorted. For example, we may become less aware of pain or a noisy environment
- **changes in emotional awareness.** Daydreams are more likely to be positive or pleasurable and this may enhance mood. Daydreaming to escape a boring or unpleasant situation can certainly do this. Conversely, unpleasant daydreams may depress mood. Daydreams may also flatten our response to emotional situations in the real world
- **changes in self-control.** While daydreaming, your thoughts are on internal events rather than what is happening around you. Monitoring your behaviour is unlikely. You could even dribble without noticing!
- **diminishing time orientation.** We lose our sense of time when daydreaming. Have you ever stopped daydreaming and wondered where the time has gone? Time can appear to move very fast or slow when daydreaming.
Alcohol-induced states

The most common method of deliberately altering states of consciousness is through the use of psychoactive drugs. **Psychoactive drugs** are chemical substances that affect the nervous system and brain activity. As a result, they impact on our consciousness by altering thoughts, feelings, perceptions and behaviours. Psychoactive drugs generally target specific **neurotransmitters** – chemicals that allow communication between **neurons** (nerve cells) that are responsible for the function of our nervous system, including the brain (see Chapter 5).

In our society, psychoactive drugs include:

- **Depressants** which decrease nervous system activity, e.g. alcohol, barbiturates (sleeping pills) and benzodiazepines (tranquilisers)
- **Stimulants** which increase nervous system activity, e.g. caffeine, amphetamines, cocaine and ecstasy
- **Opiates** which provide pain relief and cause mood changes, e.g. opium, morphine, codeine and heroin
- **Hallucinogens** which cause hallucinations, a distorted sensory experience and loss of reality, e.g. LSD
- **Marijuana** which produces an uninhibited euphoric state and impaired judgment and thinking.

Deliberately altering consciousness with alcohol is a widely accepted practice in our society despite the growing awareness of the dangers associated with this common drug. The psychological and physiological effects of alcohol can create long-term physical, social and personal problems. The effects can be devastating.

Alcohol is a depressant – it slows or depresses the nervous system. Many people mistakenly believe that alcohol is an ‘upper’ or a stimulant. This misconception is probably because, in low doses, alcohol reduces inhibitions and may cause a feeling of relaxation and well-being. Thus, a person who has consumed alcohol may seem more stimulated, active and talkative than usual but this is most likely because of reduction of inhibitions. In high doses, alcohol depresses the nervous system so much that it slows down vital life processes and can cause blackouts, comas and even death. The relationship between percentage of blood alcohol concentration (BAC) and behaviour can be seen in Table 2.3. During adolescence, a time of great brain development, alcohol can have permanent negative effects. It is likely that you have seen advertisements that raise this issue.
### TABLE 2.3: Relationship between blood alcohol concentration and behaviour, including driver performance

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>BLOOD ALCOHOL LEVEL</th>
<th>GENERAL EFFECT ON BEHAVIOUR</th>
<th>EFFECTS ON DRIVER PERFORMANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feeling of well-being</td>
<td>0.02–0.05</td>
<td>Lowered alertness</td>
<td>Difficulty seeing or locating moving lights</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Talkative</td>
<td>Difficulty judging distances</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Relaxed</td>
<td>Tendency to take more risks</td>
</tr>
<tr>
<td></td>
<td></td>
<td>More confident</td>
<td>Decreased ability to respond to several stimuli</td>
</tr>
<tr>
<td>At-risk state</td>
<td>0.05–0.08</td>
<td>Talkative, Acts and feels self-confident</td>
<td>Ability to judge distances is further reduced</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Judgment and movement impaired</td>
<td>Sensitivity to red lights</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inhibitions reduced</td>
<td>Slower reaction times</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Shorter concentration span</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Five times more likely to have an accident at 0.08 BAC than those not under the influence</td>
</tr>
<tr>
<td>Risky state</td>
<td>0.08–0.15</td>
<td>Speech slurred</td>
<td>Euphoria sets in</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Balance and coordination impaired</td>
<td>Overestimation of one’s ability leads to reckless driving</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reflexes and reaction times slowed</td>
<td>Very poor peripheral vision</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Visual attention impaired</td>
<td>Impaired perception of obstacles</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unstable emotions</td>
<td>10 times more likely to have an accident at 0.12 BAC than those not under the influence</td>
</tr>
<tr>
<td>High-risk state</td>
<td>0.15–0.30</td>
<td>Unable to walk without help</td>
<td>Driving ability is extremely impaired, and with likely loss of consciousness, impossible.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Apathetic, sleepy</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Laboured breathing</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unable to remember events</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Loss of bladder control</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Possible loss of consciousness including blackouts</td>
<td></td>
</tr>
<tr>
<td>Death</td>
<td>Over 0.30</td>
<td>Coma</td>
<td>Unconscious</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Death</td>
<td></td>
</tr>
</tbody>
</table>

### ALCOHOL-INDUCED ALTERED STATE OF CONSCIOUSNESS

Study Table 2.3 and answer the following questions:

1. Consider the likely effects of alcohol consumption and its effects on driving performance. Categorise each effect into one or more of the following characteristics of consciousness:
   - **a.** Level of awareness (awareness of internal and external events)
   - **b.** Controlled and automatic processes (ability to effectively perform two or more tasks at once)
   - **c.** Content limitations (amount of control you have to limit what you want to attend to)
   - **d.** Perceptual and cognitive distortions (awareness and efficiency of your perceptions and cognitions)
In Australia, alcohol is legal and highly accessible, although laws prohibit the selling of alcohol to those under 18 years of age. This is despite the huge negative impact that alcohol abuse has on our society. The effects of alcohol can be severe, e.g. irreversible memory disorder (Korsakoff’s syndrome), enlargement and scarring of the liver (cirrhosis), impact on the teen brain, negative social consequences (dysfunctional home and work relationships, isolation, fights) and serious injury or death. These effects make alcohol, arguably, the most dangerous drug in our society.

Alcohol is consumed to purposely alter a person’s state of consciousness. The degree to which a person experiences the effects of alcohol depends on a number of factors, including tolerance levels (alcohol is a drug of addiction), rate of consumption, gender, height and weight (York & Welte 1994). The characteristics of an alcohol-induced state include:

- **lowered level of awareness.** Alcohol depresses (slows down/relaxes) the nervous system. As a result, alcohol significantly decreases a person’s level of awareness – they will be less aware of internal and external events. They will have difficulty concentrating and attending to everything that is going on around them. An intoxicated person is likely to attend to one thing at a time and be easily distracted.

- **more or less content limitations.** The content of an alcohol-induced altered state of consciousness is less restricted than in normal waking consciousness. The type of information that enters consciousness may be broader than in normal waking consciousness. Unrelated, obscure, irrational, illogical and even lateral thoughts are not uncommon, particularly as the ability to attend to and concentrate on a particular task is impaired. People are likely to be more talkative and less inhibited or easily talked into saying or doing things they normally would not do.

- **difficulty performing controlled processes.** Think of a scene in which a person is under the influence of alcohol. They are likely to be staggering along, being clumsy and reacting to things more slowly than usual. Alcohol impairs the functioning of the brain, including the cerebellum, a large structure at the base of the brain that is responsible for balance and coordination. This affects reaction times, thinking and

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- **difficulty performing controlled processes.** Think of a scene in which a person is under the influence of alcohol. They are likely to be staggering along, being clumsy and reacting to things more slowly than usual. Alcohol impairs the functioning of the brain, including the cerebellum, a large structure at the base of the brain that is responsible for balance and coordination. This affects reaction times, thinking and
perception. As a result, carrying out complex tasks (controlled processes) becomes more difficult as the person consumes more alcohol. Even simple tasks (automatic processes) such as writing become more difficult as alcohol is consumed.

- **likely perceptual and cognitive distortions.** Alcohol depresses the brain and its functions, distorting thoughts, perceptions and behaviours (Stahl 1996). Reaction time and reflexes are slowed, which affects motor coordination. Speech is slurred and judgment is impaired. The perception of stimuli from our senses (including pain and temperature) is dulled. Vision may be hazy or blurred. A person’s ability to focus attention and think clearly is impaired. This makes it harder for the brain to process information and form memories (Givens 1996). Alcohol can cause someone to lose the ability to pay attention to as much information as when they are sober and this negative effect has been termed ‘shortsightedness thinking’ or ‘alcohol myopia’ (Steele & Josephs 1990). As such, a person under the influence of alcohol is only able to focus on aspects that stand out in their immediate surroundings without thinking of the long-term consequences. They find it difficult to weigh up the pros and cons of a situation or course of action. In this case, brightly coloured warning signs are needed in drinking environments so intoxicated people can attend to the dangers.

- **changes in emotional awareness.** Alcohol can give you a false sense of confidence, which can affect the way you behave and express emotions. People’s emotional states can vary. It can cause someone to become aggressive and violent or sad and uncommunicative. We may misread or not consider other people’s emotions, or we may have flattened emotional responses.

- **decrease in self-control.** Alcohol can cause people to behave aggressively, become over-friendly, share private thoughts and do silly things. They may take risks they would not normally take and carry out behaviours that they would not normally do. People are more likely to engage in sexual activities despite alcohol impairing sexual performance (Cooper 2002). A New South Wales survey of prisoners found that almost half had been drinking in the 24 hours leading up to the offence, and 25 per cent blamed alcohol for the offence (Stathis 1991). In addition, 42 per cent of homicides involved alcohol.

- **time orientation diminishes.** The ability to track the time is lost when in an alcohol-induced state. Time can appear to pass more quickly or more slowly than it actually does.
Meditation – another example of an ASC

While meditation is not explicitly mentioned in the study design, it is an example of an altered state of consciousness that is a different experience from daydreaming and alcohol-induced state. Although being good at meditation takes practice, it is an altered state of consciousness that you can begin to experience in class (try Investigate 2.8).

Meditation induces an altered state of consciousness in which a person uses mental exercises to become highly focused on a single thought to the exclusion of others. This single thought may be a stimulus that is usually ignored, such as breathing, or a simple stimulus such as a pattern or a word. As a result, meditation encourages a heightened awareness and brings cognitive processes under greater control. The normal flow of consciousness is disrupted and, with practice, meditation prevents the ever-changing stream of thoughts from entering consciousness.

Meditation has a long history, especially in Eastern cultures, dating back at least 26 centuries as an integral part of many religious practices. For example, Buddhists view meditation as a vehicle to produce inner peace, insight and enlightenment, as well as opening the pathway to different dimensions of consciousness.

In Western society, meditation is becoming more popular regardless of people’s religious beliefs. It is seen as a way to achieve a state of serenity and promote psychological and physical health, especially in terms of managing stress. These are positive benefits that most, if not all, people would like to experience. Meditation is a vehicle to developing a deeper understanding of reality and the purpose of life as it encourages extended reflection and contemplation.
Why is meditation considered to be an altered state of consciousness?

The characteristics of meditation include:

- **lowered level of awareness.** While meditation leads to a heightened awareness of a single thought, your overall level of awareness decreases. Meditators are not aware of other stimuli, from either internal events or external surroundings. Experienced meditators become totally unaware of their body and surroundings. Some have been known to meditate in the freezing cold for hours at a time and others on a bed of nails with no obvious perception of cold or pain.

- **more or less content limitations.** What you think about during meditation is usually strictly limited. Your attention is narrowly focused on a single stimulus, train of thought or movement or, as in the case of mindfulness meditation, your thoughts pass through your mind without judgment. Meditation is a skill you must practise in order to be able to control your thoughts, or limit their content. This restriction of content leads to beneficial psychological and physiological effects.

- **difficulty performing controlled processes.** During meditation, the person is usually very still or performing slow-moving exercises, such as those in t’ai chi. The mental (and sometimes physical) exercises are initially controlled processes. They require hours of training to be performed correctly. Performing other controlled or automatic processes while meditating is not encouraged and is, most likely, impossible.

- **likely perceptual and cognitive distortions.** Meditation has been used for pain control because the stimuli that you attend to during meditation are restricted. You effectively remove pain from your conscious awareness by not paying attention to it. Cognitive processes are under control during meditation. You can feel more focused, creative and aware following meditation. Experienced meditators have claimed that meditation leads to insight into the meaning of life and enlightenment.

- **changes in emotional awareness.** Meditation can give a sense of control over emotions and reduce the feelings associated with stress. It can increase self-awareness and empathy for others. It can help you pay attention to the emotions that you are experiencing and reduce any negative impact they may be causing. There are many traditional religions, such as Buddhism, that include meditation as a pathway to happiness.

- **changes in self-control.** Meditation increases your self-control. It takes much practice to become adept at controlling your thoughts and behaviours while meditating. **Reducing time orientation.** Like other altered states of consciousness, we lose our sense of time when meditating. Time often appears to fly by or, for some, remain stationary.
GUIDED MEDITATION

Meditation is an example of an altered state of consciousness, one you can try to deliberately induce yourself. Guided meditation exercises, such as the one below, encourage a relaxed state and are particularly good for someone who is new to meditation and prefers listening to a soothing, relaxed voice. Meditation is a trained skill and it takes practice to become good at it. Meditation can help you become calmer and your thoughts become clearer. It is often used as for stress management.

Before you start, take the following measurements:
→ your level of anxiety, on a scale of 1 = very calm, 2 = calm, 3 = slightly tense, 4 = tense, 5 = very tense
→ your heart rate [beats per minute).

Follow the instructions for the meditation exercise and then answer the questions about your experience.

The meditation exercise

Make yourself comfortable, either at your desk or on the floor. Either record the following instructions first and play them back or get someone (perhaps your teacher) to read them slowly to you, including pausing at the appropriate times.
→ Sit quietly for about a minute, concentrating on your breathing. Breathe in slowly through your nose. Let your lungs fill up with air and then breathe out slowly through your mouth. Breathe in and out another 10 times, allowing yourself to relax and unwind.
→ Visualise your muscles relaxing. Notice how quickly your body relaxes from the top of your head to the tips of your toes. Breathe in and out another three times.
→ Imagine you are in a quiet place. Take your time to look around this place. What does it look like? Where is it? What does it smell like? What colours dominate the landscape?
→ Imagine there is a track. Walk along this track. What type of track is it? Is it bumpy, smooth, wide or narrow?
→ Imagine that you can hear water. Walk along your track to the water. What sort of body of water is it? What noise is it making? Describe the landscape – what does it look, feel and smell like?
→ You notice something on the ground at your feet. Slowly bend down to look at this object. You start to become smaller and smaller and are now the same size as the object on the ground. What does it look like? Note the texture on the object.
→ You start getting bigger and bigger. Pick up the object on the ground and carry it back along the path to your quiet place.
→ Breathe in and out another five times. You are slowly becoming aware of where you are again. When you are ready, slowly open your eyes.

Now take the following measurements:
> your anxiety levels
> your heart rate
> an estimate of how long the exercise took.
Discussion

1. Compare your experiences with other members of the class. For example:
   a. Describe your quiet place. Did other people have a similar quiet place?
   b. What type of path did you walk down? What was the body of water? What was the object that you picked up?
   c. Were your visual images very vivid?
   d. Were you distracted by any outside noise or other events in your surrounding environment?

2. Consider your measurements.
   a. Were you able to relax during this activity? Did your anxiety level reduce?
   b. Did the meditation exercise reduce your heart rate?
   c. Did you accurately guess the amount of time that passed during the meditation exercise?

3. Collect class results. Work out the means for each type of measurement:

<table>
<thead>
<tr>
<th></th>
<th>DIFFERENCE IN ANXIETY LEVELS</th>
<th>DIFFERENCE IN HEART RATE</th>
<th>PERCEIVED LENGTH OF TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual results</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class results (means)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. Discuss the results. Consider the characteristics of an altered state of consciousness. To what extent did participants experience an altered state of consciousness? Discuss.

5. Were there any potentially confounding variables in this experiment? Discuss.
CHAPTER SUMMARY

Consciousness is a hypothetical construct because it is believed to exist but cannot be directly observed or measured. Descriptions are ‘constructed’ to explain it.

Normal waking consciousness can loosely be defined as the state of consciousness we experience when we are awake and aware of our thoughts, feelings and perceptions from internal events and the surrounding environment. During normal waking consciousness, we experience a real sense of time and place. Our experience during normal waking consciousness creates our reality and gives us a baseline from which to judge all other states of consciousness.

Consciousness can be thought of as operating on a continuum, from a high level of consciousness (awareness) through to a low level and even on to the point of being unconscious (totally unaware). The more aware we are of our thoughts, feelings, perceptions and surroundings, the greater the level of consciousness.
If we deviate from this normal baseline of waking consciousness, we experience an altered state of consciousness. Altered states of consciousness tend to differ from normal waking consciousness in terms of:

- **Level of awareness**: more or less aware of internal and external events
- **Content limitations**: usually less (though sometimes more) control to limit what you want to attend to
- **Controlled and automatic processes**: ability to effectively perform two or more tasks at once, depending on their level of complexity, is more likely to decline and it is more difficult to perform automatic processes
- **Perceptual and cognitive distortions**: the degree of awareness and efficiency of your perceptions and cognitions (thoughts and memories) is often more distorted
- **Emotional awareness**: the experience of emotions (feelings) is more or less in an altered state
- **Self-control**: the ability to maintain self-control, usually in terms of monitoring behaviours, is affected
- **Time orientation**: the ability to correctly perceive the speed at which time passes declines.

We daydream when we shift attention to our private thoughts, feelings and imagined scenarios and ignore the external world. Since the level of awareness of external stimuli is reduced, daydreams are considered an altered state of consciousness.

Alcohol is a psychoactive drug of dependence. It is a depressant, slowing or depressing the nervous system and, as a result, alters our state of consciousness.
KEY TERMS
For the exam, you must know definitions for the following key terms and concepts and be able to relate them to an example where appropriate:
- alcohol-induced state of consciousness
- altered states of consciousness
- attention
- automatic processes
- cognition
- consciousness
- continuum of awareness
- controlled processes
- daydreams
- divided attention
- normal waking consciousness
- perception
- psychoactive drugs
- selective attention
- states of consciousness

KEY IDEAS
For the exam, you must know:
- the reason why consciousness is a psychological construct
- the difference between normal waking consciousness and altered states of consciousness, including the possible differences in each of the following characteristics:
  - level of awareness
  - controlled and automatic processes
content limitations
perceptual and cognitive distortions
emotional awareness
self-control
time orientation
the reasons, in terms of the characteristics of consciousness, that each of the following is known as an altered state of consciousness:
daydreaming
alcohol-induced states
the ability to classify examples of a state of consciousness as normal waking consciousness or altered state of consciousness.

RESEARCH METHODS
For the exam, you must be able to:
understand the challenges that surround studying consciousness
use your knowledge of research methods to evaluate a research study
apply your knowledge and understanding from this chapter to a related research study
understand ethical considerations relating to studying consciousness.

→ TEST YOUR UNDERSTANDING

MULTIPLE CHOICE

1 Which of the following is likely to be true for a person in an altered state of consciousness?
   a The person may find it easy to judge the passage of time.
   b The person may have more control over emotions.
   c The person may be more open to suggestion.
   d The person may find that their powers of thought and reasoning are enhanced.

2 Which of the following is unlikely to be true for a person in a (heightened awareness) altered state of consciousness?
   a The person may find it difficult to judge the passage of time.
   b The person may be more sensitive to noise than in normal waking consciousness.
   c The person may be more (or less) emotional than they are when in normal waking consciousness.
   d The person may find that they are paying selective attention to several automatic processes.
3 Which of the following is not a true statement?
   a. Controlled processes require divided attention.
   b. Automatic processes enable divided attention.
   c. Controlled processes require selective attention.
   d. Both controlled and automatic processes enable divided attention.

4 When Erwin was first learning to play the guitar, he found it impossible to change chords and sing at the same time. Now that he has been in a rock band for two years, he finds it easy to play, sing and even execute complex sequences of steps on stage. The explanation for this is:
   a. an automatic process has become a controlled process, enabling divided attention.
   b. a controlled process has become an automatic process, enabling selective attention.
   c. an automatic process has become a controlled process, enabling selective attention.
   d. a controlled process has become an automatic process, enabling divided attention.

5 Controlled processes require __________ attention.
   a. selective
   b. divided
   c. automatic
   d. unconscious

6 Victor has been driving a manual car for several years; Hugo has just passed his test for his P-plates. When Miranda is a passenger in their cars, she finds that she can have a sensible conversation with Victor but Hugo does not seem to pay any attention to her. Which of the following is the most likely explanation for this?
   a. For Victor, driving is a controlled process enabling divided attention.
   b. For Victor, driving is a controlled process requiring selective attention.
   c. For Hugo, driving is a controlled process enabling divided attention.

7 Sacha is sitting in class one afternoon. She hears what the teacher is saying, feels that she would like to open a window to relieve the stuffiness and wonders how tough basketball training will be later today. Sacha can be described as being in:
   a. an altered state of consciousness of heightened awareness.
   b. an altered state of consciousness of reduced awareness.
   c. a state of normal waking consciousness.
   d. a state of daydreaming.

8 Johannes is sitting in class, trying to listen to what the teacher is saying but he is also aware that he is feeling warm in the sunshine, he is looking forward to a game of tennis after school, the new girl in the row in front of him has sparkling highlights in her hair and the chair he’s been sitting in for the double lesson has a hard seat! Johannes is most likely experiencing:
   a. normal waking consciousness.
   b. an altered state of consciousness showing reduced awareness.
   c. an altered state of consciousness showing heightened awareness.
   d. distortions of cognition and perception.

9 Tia is taking her first driving lesson in a manual car. Which of the following is not likely to be true?
   a. Tia finds it difficult to judge the passage of time.
   b. Tia finds it difficult to hold a sensible conversation with the instructor.
   c. At the end of the lesson, Tia finds it difficult to remember features of the buildings they have passed.
   d. At the end of the lesson, Tia can recall all the features of the route they have taken.
10 Ravi is experiencing an altered state of consciousness. He does not notice that the temperature has dipped to below 4°C. Which of the following explains his experience according to the characteristics of an altered state?
   a. Ravi’s self-control is reduced.
   b. Ravi’s controlled processes require increased attention.
   c. Ravi’s perception of the passage of time is distorted.
   d. Ravi’s perceptions are distorted.

SHORT ANSWER

11 Matilda has taken juggling classes for the last six months. She had never juggled before the classes started and found it quite difficult. Now she is quite good and can easily carry out a conversation while juggling. She often performs in front of an audience. Do you think Matilda was capable of carrying out a conversation when she first started juggling? Explain your answer with reference to the psychological terms that relate to attention and type of processes.

12 Playing 'Advance Australia Fair' on the piano can change with experience from being a controlled process to being an automatic process. Explain what this means.

13 Giacomo is taking painkillers for a torn hamstring muscle. He believes that these are so strong that they put him into an altered state of consciousness (ASC). He asks his girlfriend, Maria, to observe him carefully and report his behaviour so that he can decide whether he enters an ASC. Given Maria has no electronic equipment, suggest two behaviours she may observe that will show Giacomo to be in an ASC.

14 a. What is the continuum of awareness?  
   1 mark

   b. Where does normal waking consciousness tend to be situated on the continuum of awareness?  
   1 mark

15 Can we experience more than one state of consciousness during normal waking consciousness? Explain your answer.  

2 marks

16 With reference to two characteristics of consciousness, explain why each of the following is considered to be an altered state of consciousness: daydreaming, alcohol-induced state.  

4 marks

17 Marcel is working outside on an extremely hot day. As a result, he is experiencing an altered state of consciousness. What is he likely to experience, in terms of: content limitations? perceptual and cognitive distortions? perception of time?  

3 marks