

# Theories of Anxiety



## Required Reading

Freeman, D., & Freeman, J. (2012). *Anxiety: A very short introduction* (14-33; 132-133). Oxford: Oxford University Press.



## Learning Outcomes and Connections to Course Outcomes

Once you have reviewed the material in your required reading, you will be able to complete the following:

- Identify, examine and construct new perspectives by understanding the limitations interfering with our thinking, whether arising from our biological make-up, or from our individual psychology.
- Identify, summarize and critique the predominant scientific explanations of our behaviour.



## Main Topics

- Sigmund Freud: Anxiety as Neurosis
- Behaviourism & Cognitive Behaviourism
- Neurobiological Theories of Anxiety

# Introduction to Theories of Anxiety

The focus of this lesson is once again on the two kinds of elements that make us who we are: the innate (biology; nurture) and the socially constructed (culture; nurture). In this case, we will be looking at these elements where mental health intersects with biology and socialization. How can the social sciences help us explain our perception of ourselves and others? Why do we feel the way we do? How can we explain the existence of something like anxiety, which doesn't seem adaptive in terms of evolution and doesn't seem to serve much social purpose either at first glance?

It may seem counter-intuitive, but it seems that in many respects we actually *need* anxiety—it is crucial to our survival. Anxiety “orients us to danger and prepares our bodies to either challenge or escape it.”[1]

People constantly evaluate their environment for cues about what they need or desire or even fear—interpreting every interaction as to its significance and importance. Our initial appraisal or interpretation of the situation may not be a conscious process, but may in fact be the result of “intuition.” It is as if our senses function like an ‘early warning system’ picking up on what may be important and passing this information on to the more rational and deliberate parts of our brains to ponder or consider. When we detect a threat we are not sure we can handle, then we feel anxiety.[2]

## A Matter of Perspective

Consider the following scene—it is a sunny and beautiful day, and you are enjoying a walk in the woods when suddenly you spot a bear nearby. What do you do? Do you *flee* and run away? Do you *fight*, in this case yelling and waving your arms to appear intimidating to the bear? *Freeze* and stay completely still until the bear passes by, hoping that it will ignore you? Unfamiliar with the freeze response? This brief video explains how doing nothing in an emergency can be explained by the Normalcy Bias.[3] Anxiety may actually help us choose the right reaction to cope with a challenging and stressful situation.[4]

■ Flight, Fight, or Freeze: The Perils of Normalcy Bias - Epic Science #74

(<https://www.youtube.com/watch?v=aBpnuUwCjtk>)

Once a situation has been appraised, people typically respond to anxiety or stress in one of two main ways—either through direct action (attack or avoid) or through intrapsychic processes, mental strategies that allow one to manage the stress (you can think of these as psychological defense mechanisms).[5] It is a shared normal and temporary experience to feel anxious. You have probably felt nervous before writing a test, or may have experienced ‘butterflies’ in your stomach before a big game, first date, or job interview. Maybe that small feeling of anxiety even gave you a bit of a thrill, sharpened your senses, or helped you to have a competitive edge. While anxiety is useful, if it becomes persistent or the norm rather than the exception, or if our efforts to manage it conflict with living our best lives, then we must recognize it as an issue. According to the Canadian Mental Health Association, about 20% of Canadians have a mental disorder, or 1 in 5.[6] Delving further, 12% of Canadians specifically have issues with anxiety. Anxiety is a significant social problem. People with anxiety often find it difficult to lead full lives; they may not be able to deal with normal social interactions. They are in emotional pain and find it hard to focus. There are also financial repercussions to anxiety, like physical illness and having to miss work. In the U.S., it is estimated that the total costs of anxiety result in a loss of 42 to 47 million dollars every year.[7]

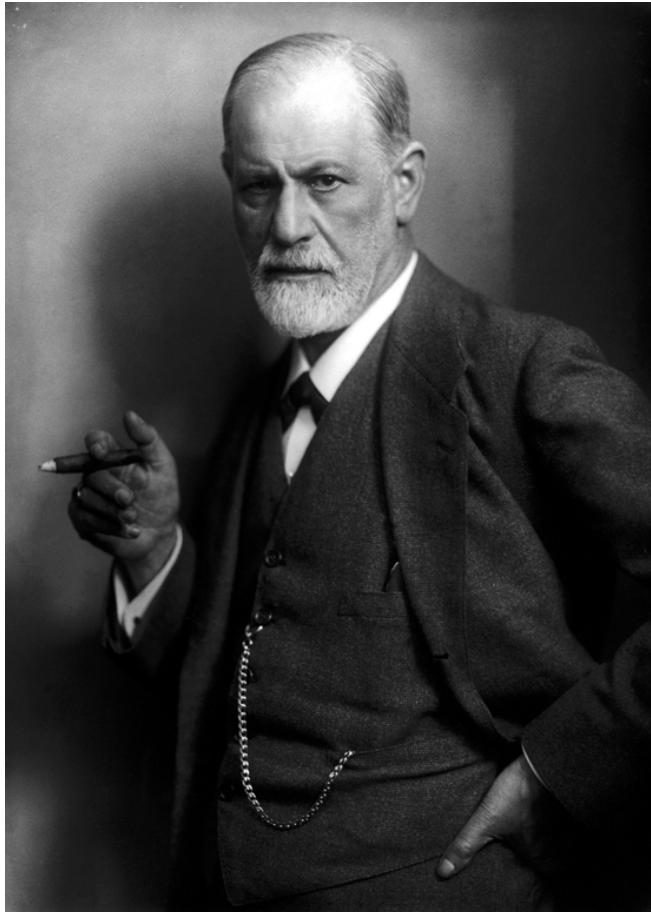
## Thinking Critically

During this lesson, and while you read the assigned article, ask yourself the following questions:

- Can you remember circumstances or events in your life which led you to fight, flight, or freeze because of your anxiety? Do most people react to stress in the same way? How might their reactions be different from yours?
- Is anxiety something that comes from our innate biological instincts or do you think we learn to be anxious based on the conditioning of our environment?

- As you read the assigned article, and compare what you have learned to your own life, is there one method for treating or explaining anxiety that makes the most sense to you? Is there one approach you think would be the most successful, or do you think it best to try a combination of treatments?

# Sigmund Freud: Anxiety as Neurosis



Source: Max Halberstadt [Public domain], via Wikimedia Commons ([https://commons.wikimedia.org/wiki/File%3ASigmund\\_Freud\\_LIFE.jpg](https://commons.wikimedia.org/wiki/File%3ASigmund_Freud_LIFE.jpg))

The term anxiety was rarely used by doctors and scientists until the twentieth century.[8] Prior to the groundbreaking work of Sigmund Freud (1856-1939), mental illnesses were generally assumed to be caused by nerve damage or lesions on brain. Freud shared that view when he went to Paris in 1885 to study with Jean Charcot. Charcot was conducting fascinating experiments where he put hysterical patients under hypnosis. Charcot proved that you could implant ideas into someone in the hypnotic state and produce a very real physical symptom. Charcot and Freud made the astonishing connection that disease was not just in the body, but that it could be in the mind as well. [9] Put simply, diseases could be caused by ideas. This revolutionized the way society viewed mental illness.

You are likely already familiar with Freud's model of the fractured self—made up of the id, superego, and ego. Please review this quick video ↗ (<https://www.youtube.com/watch?v=VNC4ql-DLIM>) as a reminder. By the 1890s, Freud believed the anxiety displayed by his patients was because they had failed to deal with the impulses from their id, the infantile and animal drives found in their unconscious minds.[10] Eventually, he concluded that anxiety was a “neurosis” — a mental dysfunction in which symptoms of irritability, pessimism, panic attacks, nausea, and phobias were produced by unresolved conflicts in a person’s mind, by conflicting, and usually “repressed” aspects of one’s thoughts and emotions that led to physical symptoms. Freud called such anxiety “neurotic” (“all in your head”) to distinguish it from anxiety that is justified by real-world factors (like your fear of being bitten by a large barking dog or falling down a steep set of stairs or making the wrong decision about a life-altering situation). If your feelings are a response to a *real/danger* (outside your own mind and imagination and

unconscious) they are not pathological. He contrasted this with neurotic anxiety—where the ego feels overwhelmed by the demands of the id and the superego (for instance, worry you will do something that might result in socially unacceptable behaviour, like violent road rage or hitting someone on the street). Freud considered neurotic anxiety excessive and irrational. Realistic Anxiety “arises from threats in the external environment; neurotic anxiety from within, though we are unaware of its true cause. Realistic Anxiety helps us; neurotic anxiety can make our life a misery.”[11]

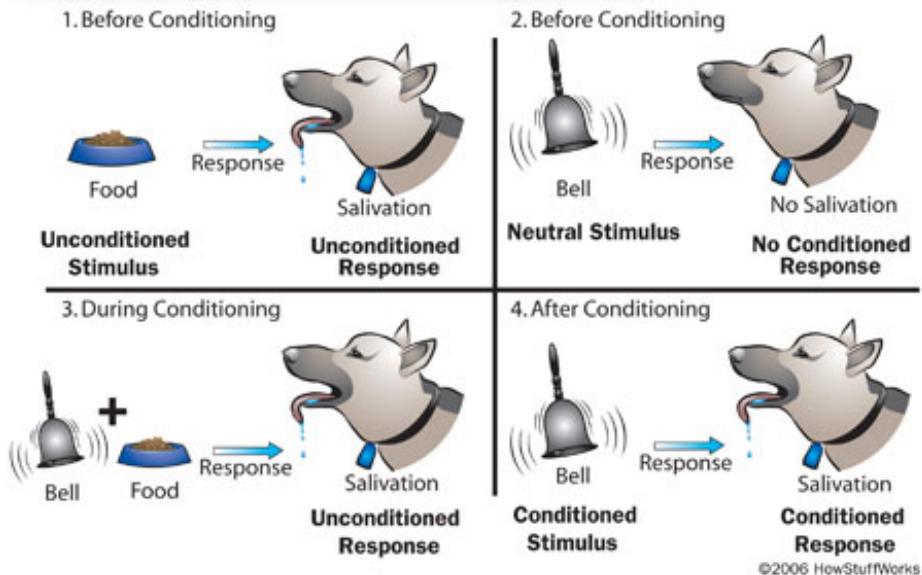
Freud’s method of treating neurosis was psychoanalysis, or the talking cure, where patients talked freely about their dreams and childhoods, their fears, desires and anxieties in order to reveal clues about their subconscious.



Source: By André Brouillet [Public domain or Public domain], via Wikimedia Commons ([https://commons.wikimedia.org/wiki/File%3AUne\\_le%C3%A7on\\_clinique\\_%C3%A0\\_la\\_Salp%C3%A9tri%C3%A8re.jpg](https://commons.wikimedia.org/wiki/File%3AUne_le%C3%A7on_clinique_%C3%A0_la_Salp%C3%A9tri%C3%A8re.jpg))

# Behaviourism

## How Dog Training Works



Source: HowStuffWorks (Creator). (2006). Pavlov's famous study [Illustration]. Retrieved from <http://animals.howstuffworks.com/pets/dog-training1.htm> (<http://animals.howstuffworks.com/pets/dog-training1.htm>)

Behaviourism is a scientific approach, with a focus on what can be *observed*. Behaviourists rejected Freud's theory of a conflicted self with an ego, superego, and id, and massive unconscious that could only be explored indirectly, because you can't actually see or measure any of these things; they are entirely theoretical, quite possibly the products of Freud's own imagination. Thoughts, emotions, dreams—all were considered by the Behaviourists to be irrelevant because they cannot be studied scientifically.

As Behaviourists see it, all your actions, emotions and behaviours are the product of your environment, training, and experience. All behaviour is learnt from the environment through associations.[12] This is called conditioning. Conditioning may be intentional, as when your parent punishes you for a behaviour they don't want you to display and rewards you when you behave in a way they like, or unintentional. If you have a lisp and your classmates giggle every time you speak in class, you will likely come to feel anxiety about speaking and perhaps about going to school at all. Your classmates aren't trying to train you to be afraid to speak, but they do condition you to be averse to it unintentionally.

A founder of the movement, Ivan Pavlov, conducted a classical conditioning experiment on dogs, training them to salivate at the sound of a bell. The video below goes into more detail and also introduces you to the next significant experiment in classical conditioning—Little Albert. The end of the clip delves into Operant Conditioning.

The purpose of John B. Watson and Rosalie Rayner's 1920 experiment was to condition a severe emotional response or learned pattern of fear (a phobia). They presented Albert with white furry objects, and he acted like the curious child he was, happily reaching out to touch them. When the neutral stimulus (white rat) was paired with an unconditioned stimulus (a very loud noise from a gong) the baby startled and cried. It soon became clear that this fear was *generalized* by Albert to other small furry animals and things.[13] Sadly Albert sadly passed away from an illness at the age of six so it is unknown as to whether or not this conditioning had long-term effects.[14] An experiment like this one would not be allowed today due to its questionable ethics. Watson and Rayner used the example of Little Albert as evidence for their theory that all fears were the result of conditioning: we learn them, usually in our childhood.[15]



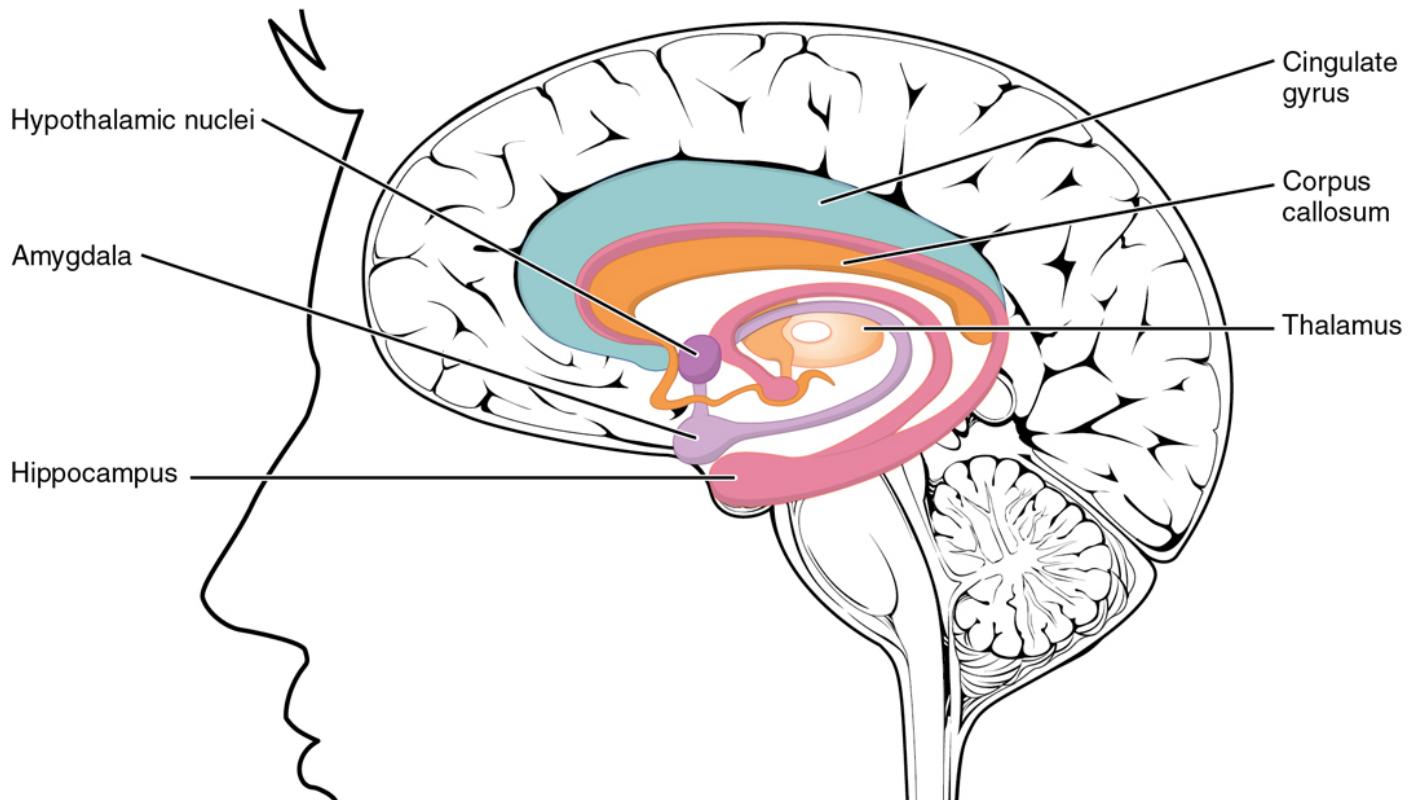
Source: By Galiaoffri (Own work) [CC BY-SA 3.0 (<http://creativecommons.org/licenses/by-sa/3.0>)], via Wikimedia Commons ([https://commons.wikimedia.org/wiki/File%3AIllustration\\_based\\_on\\_the\\_filming\\_of\\_the\\_Little\\_Albert\\_Experiment.jpg](https://commons.wikimedia.org/wiki/File%3AIllustration_based_on_the_filming_of_the_Little_Albert_Experiment.jpg))

## A Matter of Perspective

Anxiety is the conditioned response to pain, which can motivate and reinforce behaviour that avoids or prevents pain. O.H. Mowrer explained how irrational anxieties take root through his theory of “two-stage” anxiety. Do you know someone who is afraid of flying? Do they refuse to even step on a plane? Due to this fear, the anxious flyer may never travel by air, which deprives them of the chance to discover how their fears are exaggerated or unjustified—“by avoiding such situations, our anxiety merely tightens its grip.” [16] It is also clear that we do not actually have to experience an event ourselves to become afraid of its repetition. We can learn to fear from how others behave and from what they tell us, while other fears may be hard-wired by evolution. [17]

Behaviourism does not provide a complete explanation of anxiety, but the capacity to learn from experience and form plans on how to avoid future danger is an important survival skill. Please watch this brief clip ↗ (<http://www.youtube.com/watch?v=IMZ5o2uruXY>). It follows a woman’s journey while undergoing Cognitive Behavioural therapy to address her phobia of feathers. Step by step she learns that while her anxiety might peak, it also dissipates as she once more returns to a feeling of calm and normalcy. At the root of Cognitive Behavioural Therapy ↗ (<http://www.youtube.com/watch?v=0ViaCs0k2jM>) is the insight that unhelpful thoughts, feelings and behaviour are not innate but learned, and so can be unlearned. The creation of safety behaviours and with the help of social supports “people manage the uncertainties associated with stress, and increase their sense of personal control or efficacy over their environment.”[18]

# Neurobiological Theories of Anxiety



Source: By OpenStax College [CC BY 3.0 (<http://creativecommons.org/licenses/by/3.0>)], via Wikimedia Commons ([https://commons.wikimedia.org/wiki/File%3A1511\\_The\\_Limbic\\_Lobe.jpg](https://commons.wikimedia.org/wiki/File%3A1511_The_Limbic_Lobe.jpg))

Freud proposed a theory of anxiety that focused on the inner mind of an individual – the conflicts and repressed fantasies. The Behaviourists believed that anxiety was a “learned” response, based on conditioning by environmental stimuli. Both of these fall under the heading of “nurture” – problems with anxiety being something that develops during our childhood and adolescence on the whole.

Now let's look at more “nature”-oriented attempts to understand anxiety. Brain scientist Joseph LeDoux identified the Amygdala (<http://bigthink.com/videos/the-amygadala-in-5-minutes>), a part of the limbic system, as the brain’s “emotional computer.”[19] The amygdala, which is very well connected to other parts of the brain, is responsible for fear reactions, and houses *unconscious* fear memories. This means that we can become anxious without knowing exactly why. Some of our fears might even be holdovers from an earlier period of human evolution. LeDoux argues that “the amygdala is able to process the emotional significance of individual stimuli as complex situations...The amygdala is, in essence, involved in the appraisal of emotional

meaning.”[20] In other words, when we feel threatened, the amygdala “screams out in fear.” The limbic system pays attention to this change and sends stimulation up to the cortex where these sensations inform our higher-order mental structures.[21]

When stress hormones like corticotropin are released over long periods because of persistent anxiety, it can actually change how the brain functions. Short-term memory can be impaired and the hippocampus (which helps form and store memories) can shrink. Excessive anxiety, like loneliness and depression, leave physical markers on our bodies, even if their roots are psychological.[22]

The neurological views that are emerging are in a certain sense consistent with what Freud thought: disease can be caused by ideas and emotions. But it is important to remember that there are also physical aspects of mental illness. In the end, neurology — medication, gene therapy, minute surgery — may be able to do more to reduce anxiety than Freud’s “talking cure.” As mental symptoms go, anxiety is perhaps the most acutely physical of them. Racing heart, stomach cramps, acid reflux, irritable bowel, muscle tension, dizziness — these are just a few of the physical manifestations of anxiety. A very effective mental health campaign has the slogan “depression hurts (<http://depressionhurts.ca/en/default.aspx>).” Perhaps anxiety is at least as painful.

# Summary



Source: © istockphoto.com/ RapidEye

Anxiety is a normal reaction to stress. It helps us to deal with a tense situation at work, to study harder for an upcoming test, and can keep us out of harm's way. When it overwhelms your ability to fully function in the world, however, it can be problematic and require treatment. Why do people feel anxious? Are we doomed to feel out of control when anxiety strikes or does science provide any insights into how it happens and how we could manage it better? This lesson briefly examines three influential ways of understanding anxiety: Freudianism, Behaviourism, and Neurological.

## Additional Resources

-  Ted Talks (Ed.). (2014, March). Chris Hadfield: What I learned from going blind in space. [18 min] Retrieved June 1, 2015.  
([http://www.ted.com/talks/chris\\_hadfield\\_what\\_i\\_learned\\_from\\_going\\_blind\\_in\\_space?language=en#t-79435](http://www.ted.com/talks/chris_hadfield_what_i_learned_from_going_blind_in_space?language=en#t-79435))
-  Canadian Mental Health Association (<http://www.cmha.ca/>)
-  Stossel, S. (2014). "Surviving Anxiety" *The Atlantic*. Retrieved June 1, 2015.  
([http://www.theatlantic.com/magazine/archive/2014/01/surviving\\_anxiety/355741/](http://www.theatlantic.com/magazine/archive/2014/01/surviving_anxiety/355741/))

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- [2] Freeman, D., & Freeman, J. (2012). *Anxiety: A very short introduction* (14-33; 132-133). Oxford: Oxford University Press. p. 23
- [3] LeDoux, J. E., & Gorman, J. M. (2001). "A call to action: overcoming anxiety through active coping" *American Psychiatric Association*. p. 1954.
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- [8] Freeman and Freeman, 14.
- [9] Gilman, S. (1993). "The Image of the Hysteric" In S. Gilman et al (Ed.), *Hysteria Beyond Freud*. Berkeley: University of California Press. p. 345-452.
- [10] Freeman and Freeman, 15, 16.
- [11] Freeman and Freeman, 16.
- [12] Freeman and Freeman, 18.
- [13] Watson, J. B., & Rayner, R. (1920). Conditioned emotional reactions. *Journal of experimental Psychology*, 3(1), 1-14.
- [14] Deangelis, T. (2010). "'Little Albert' regains his identity" *American Psychological Association*, 41(1), 10-10. Retrieved June 2, 2015, from <http://www.apa.org/monitor/2010/01/little-albert.aspx> (<http://www.apa.org/monitor/2010/01/little-albert.aspx>)
- [15] Freeman and Freeman, 18-19.
- [16] Freeman and Freeman, 19-20.
- [17] Freeman and Freeman, 21.

[18] Freedman and Freeman, 22, 26-27 and Spielberger, C. D., & Sarason, I. G. (Eds.). (2013). *Stress and Emotion: Anxiety, Anger, & Curiosity*. Taylor & Francis. p. 3.

[19] LeDoux & Gorman, p. 1953.

[20] Freeman and Freeman, 30.

[21] Krauss Whitbourne, S. (2012, October 9). "Turn Down Your Brain's Worry Center" Retrieved June 4, 2015, from <https://www.psychologytoday.com/blog/fulfillment-any-age/201210/turn-down-your-brain-s-worry-center> (<https://www.psychologytoday.com/blog/fulfillment-any-age/201210/turn-down-your-brain-s-worry-center>)

[22] Freeman and Freeman, 30-32.

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First Edition published in 2012

1 3 5 7 9 10 8 6 4 2

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British Library Cataloguing in Publication Data  
Data available

Library of Congress Cataloging in Publication Data  
Data available

ISBN 978-0-19-956715-7

Printed in Great Britain  
on acid-free paper by  
Ashford Colour Press Ltd, Gosport, Hampshire

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UNIVERSITY PRESS

# Chapter 2

## Theories of anxiety

As we saw in Chapter 1, the term 'anxiety' was rarely used by doctors and scientists until the 20th century. As interest in anxiety has grown, however, an increasingly rich and varied body of theoretical work devoted to understanding it has developed. In this chapter, we look at four key perspectives on anxiety, progressing from ideas that date back to the end of the 19th century to the most recent developments:

- psychoanalytic
- behavioural
- cognitive
- neurobiological

### Psychoanalytic theories of anxiety

The deeper we penetrate into the study of mental processes the more we recognize their abundance and complexity.

A number of simple formulas which to begin with seemed to meet our needs have later turned out to be inadequate.... Here, where we are dealing with anxiety, you see everything in a state of flux and change.

Sigmund Freud, 'Anxiety and the Instinctual Life'

An influential historical figure in the study of anxiety was the founder of psychoanalysis, Sigmund Freud (1856–1939). Freud trained as a medical doctor at the University of Vienna, specializing in neurology (the study and treatment of disorders of the nervous system). By the 1890s, Freud had come to believe that the symptoms displayed by many of his patients were the product, not of disease of the physical nervous system, but rather of their failure to deal with invisible, unconscious, and primarily sexual psychological drives. This insight became the cornerstone of psychoanalysis, which remained the predominant form of treatment for psychological problems in Europe and the United States until at least the 1970s.

Freud's interest in anxiety was marked by the publication in 1895 of his paper, 'On the Grounds for Detaching a Particular Syndrome from Neurasthenia under the Description "Anxiety Neurosis"'. As the title indicates, the principal purpose of this paper was to distinguish what Freud called 'anxiety neurosis' (*Angstneurose*) from other forms of nervous illness (or neurasthenia).

What were the symptoms of 'anxiety neurosis'? Freud listed:

- Irritability.
- Deeply engrained and distressing pessimism; the belief that disaster is just around the corner. Freud called this trait 'anxious expectation'.
- Panic attacks, often involving physical symptoms such as difficulty breathing, pains in the chest, sweating, vertigo, and trembling.
- Waking up at night in fear.
- Vertigo, in which the individual experiences 'sensations of the ground rocking, of the legs giving way and of its being impossible to stand up'.
- Phobias.
- Feelings of nausea, ravenous hunger, or diarrhoea.
- Tingling of the skin (pins and needles) or numbness.

Freud argued that, unlike other nervous illnesses, anxiety neurosis was caused by the failure to properly satisfy the build-up of sexual excitement. By way of example, Freud cited the cases of 'intentionally abstinent' men and women; men 'in a state of unconsummated excitement', for instance if they were engaged but not yet married; and women 'whose husbands suffer from ejaculatio praecox or from markedly impaired potency...[or] whose husbands practise coitus interruptus or reservatus'.

Rather ironically, given that psychoanalysis is all about the primacy of the mind, in 1895 Freud believed that anxiety was caused by *physical* factors. Sexual excitement certainly had a profound influence on the psyche, triggering the desire for sexual satisfaction, but its essence was physiological. In men, Freud argued, it consisted of 'pressure on the walls of the seminal vessels'. Freud thought an analogous process took place in the case of women, though he didn't know what this might be.

Freud's views on anxiety, however, evolved considerably over the decades. His later position is summarized in 'Anxiety and Instinctual Life', a lecture he gave in 1932. Neurotic anxiety still has its roots in sexual energy, but this energy is now seen as fundamentally psychological rather than physical.

You may have noticed the use of the term 'neurotic' here. This is because by now Freud was distinguishing between anxiety as a justified response to real danger, and so-called neurotic anxiety, which is excessive and irrational. Realistic anxiety arises from threats in the external environment; neurotic anxiety arises from within, though we are unaware of its true cause. Realistic anxiety helps us; neurotic anxiety can make our life a misery.

Key to Freud's theory of anxiety is what he called the *id*, a wild and primitive psychic reservoir of instinctive desires. The job of managing and controlling these desires, which are buried deep in our unconscious, falls to a second part of the Freudian psyche, the

ego. When the ego fails in this unenviable task, neurotic anxiety results, and the desire is thereby repressed. Freud also suggests that our episodes of anxiety recall our first encounter with danger: the trauma of birth. Each anxious fear we experience is an echo of this fundamental event.

Freud's mature theory of anxiety is illustrated by one of his most famous case studies: that of Little Hans. Hans was a five-year-old boy who developed a fear of horses. Freud, working principally from information communicated by Hans' father, argued that Hans' horse phobia was in reality a fear of his unconscious sexual desire for his mother and the retribution from his father that he unconsciously anticipated. The 'unacceptable' fear – unacceptable because resulting from an Oedipal infatuation with his mother – is transformed into a more acceptable phobia. The neat distinction between realistic and neurotic fears is thereby overturned: Freud shows that at the root of every neurotic anxiety is the fear of an external danger (in this case punishment, possibly by means of castration, at the hands of the father).

Freud was undoubtedly one of the most influential thinkers of the 20th century, yet his ideas are now deemed more or less irrelevant by scientists. As the psychologist Stanley Rachman has written: 'The entire enterprise, including the theory of anxiety, is rich in theorizing but lacking in methodological rigour and deficient in facts.'

## Behavioural theories of anxiety

Anxiety is a learned response.

O. H. Mowrer

One of the most famous experiments in the history of psychology took place in London in 1920. Directing the experiment was the then-star of Anglo-American psychology, John Broadus Watson (1878–1958). Watson was the leader of *behaviourism*, an approach

that would dominate academic psychology for much of the 20th century.

Behaviourism constituted a vigorous rejection of the academic psychology pioneered by Wilhelm Wundt (1832–1920) and William James (1842–1910) and of psychoanalysis, which had rapidly become the dominant approach in Europe to understanding and treating the mind and its disorders.

Behaviourism, as its name suggests, took as its subject the behaviour of humans and animals (it saw no fundamental difference between the two). Indeed, Watson argued that behaviour was the *only* appropriate subject for a genuinely scientific psychology to study. Thoughts, emotions, dreams – all were irrelevant. How could such phenomena be studied scientifically? In his ‘behaviourist manifesto’ of 1913, Watson had written:

Psychology...is a purely objective experimental branch of natural science...Its theoretical goal is the prediction and control of behaviour.

For Watson and his followers, all behaviour had a simple explanation: we *learn* it. And this brings us back to that celebrated 1920 experiment. Starring opposite Watson in 1920 was an infant immortalized by Watson (together with his assistant and future wife Rosalie Rayner) as ‘Albert B.’.

Albert B. was nine months old, the son of a wet nurse at London’s Harriet Lane Home for Invalid Children. Watson and Rayner began by testing Albert’s reactions to a range of objects, including a white rat, a rabbit, a dog, cotton wool, and burning newspapers. Albert – who, according to the psychologists, was a happy, healthy, and stoical child – appeared perfectly content with them all.

Some weeks later, Watson and Rayner showed Albert the white rat for a second time. On this occasion, as soon as Albert touched the

rat, the psychologists slammed a hammer against a steel bar, producing a sudden and frighteningly loud noise. Over the next few weeks, they discovered that Albert was now afraid of the white rat, even when the steel bar wasn’t struck. And not only that: the child was also scared of objects that in some way resembled the white rat, such as a rabbit or even Watson’s hair.

Watson and Rayner used the term ‘conditioning’ to describe this process of learning to fear an unthreatening neutral object or situation because of its pairing with another more obviously frightening event. In this, they were heavily influenced by the work of the Russian scientist Ivan Pavlov (1849–1936). Pavlov famously demonstrated that, once a given stimulus (for example, a metronome) is associated with food, dogs will learn to respond to that stimulus in the same way as they react to food – by salivating – even when no food is present.

Watson and Rayner used the example of Albert B. as evidence for their theory that all fears are the result of conditioning: we learn them, usually in our childhood:

the early home life of the child furnishes a laboratory situation for establishing conditioned emotional responses.

It is conditioning, they argued, that explains how irrational fears and phobias develop:

It is probable that many of the phobias in psychopathology are true conditioned emotional reactions...

One baby is not, of course, a scientifically robust sample; on the other hand, most of Watson’s experiments were performed on rats.

Behaviourist ideas regarding anxiety were subsequently developed by the American psychologist O. H. Mowrer (1907–82). In what has been termed the *two-stage theory* of anxiety, Mowrer argued

that anxiety – and specifically the desire to avoid it – is a crucial driver of human behaviour:

*anxiety (fear) is the conditioned form of the pain reaction, which has the highly useful function of motivating and reinforcing behavior that tends to avoid or prevent the recurrence of the pain-producing stimulus.* [Mowrer's emphasis]

Mowrer's emphasis on the motivating power of experience anticipates the *operant conditioning* theory of the Harvard psychologist Burrhus Skinner (1904–90). Skinner focused on the effect our behaviour has on the world around us. If the effect is positive, we learn to repeat the behaviour; a negative effect teaches us to try something different next time. So, for example, because we know how much pain an angry pitbull could inflict upon us, and the terror we'd feel as it rushed towards us, we're careful not to make any sudden or threatening movements when we walk past one.

Such behaviour is eminently sensible when it comes to genuine risks. But Mowrer's theory also helps explain how irrational anxieties can take hold. A person who avoids flying because of the anxiety it triggers in them deprives themselves of the opportunity to discover that their fears are exaggerated: the chances of being killed or injured in a plane crash are minute and the fear that seems overwhelming eventually dissipates. By avoiding such situations, our anxiety merely tightens its grip.

Behaviourist approaches to anxiety struggled to supply satisfactory answers to several important questions. For example, why is it that of the many people who experience a frightening experience – a car crash, for example – only some go on to develop a phobia that means they are fearful of travelling by car again? Why do many people develop phobias of situations in which they have never been? And if, according to classical conditioning theory, we can learn to be frightened of *any* neutral stimulus, why is it that some fears are much more common than others? Why

are so many people afraid of heights and animals and so few scared of trees or chocolate?

More recent research has suggested explanations for at least some of these conundrums. It's clear, for example, that we do not actually have to experience an event ourselves to become afraid of its repetition. We can learn to fear from how others behave and from what they tell us. So if a parent has a phobia, there is an above-average chance of their child developing it too. And some fears may have been hard-wired by evolution. Thus, although we may never have encountered a snake or a dangerous spider, our ancestors would have had ample experience of their potential danger. The very common fears of heights can be understood in the same way. These apparently vestigial fears, relics of human pre-history, are termed 'prepared' fears by psychologists.

Behaviourism doesn't provide a complete explanation of anxiety (it would be remarkable if it did!). But its contribution has been huge. Many fears are indeed learned, if not in the relatively crude fashion of classical conditioning. Indeed, the capacity to learn from experience and formulate plans to avoid future danger is surely part of the explanation for humanity's success. As Mowrer wrote:

the fact that the forward-thinking, anxiety-arousing propensity of the human mind is more highly developed than it is in lower animals probably accounts for many of man's unique accomplishments.

Behaviourism has also informed some of the most successful strategies for treating anxiety problems. The South African psychologist Joseph Wolpe (1915–97), for example, developed *behavioural desensitisation* to tackle fears and phobias. This technique, which involves gradually exposing individuals to the situation they fear – for example, heights or snakes – so they can learn that there's actually nothing to be afraid of, is still the standard treatment for phobias.

And the legacy of behaviourism can be seen in today's most widespread form of psychological therapy, cognitive behaviour therapy, or CBT. At the root of CBT is the insight that unhelpful thoughts, feelings, and behaviour are not innate but learned. And because they are not innate, they can be unlearned – and often surprisingly quickly with the help of a therapist.

## Cognitive theories of anxiety

The fundamental idea is that emotions are experienced as a result of the way in which events are interpreted or appraised. It is the meaning of events that triggers emotions rather than the events themselves. The particular appraisal made will depend on the context in which an event occurs, the mood the person is in at the time it occurs, and the person's past experiences.

Paul Salkovskis

Behaviourism – with its exclusive focus on those aspects of human life that could be studied in the laboratory – dominated academic psychology in the US and UK for much of the 20th century. But things began to change in 1956 with the advent of the so-called 'cognitive revolution'. Cognitivism aimed to identify and understand the basic processes underlying how human beings think; behaviourism had declined to study thoughts because they aren't the sort of thing you can observe directly.

The new approach was summarized in the ground-breaking *Cognitive Psychology*, published by Ulric Neisser (1928–2012) in 1967. Its subject was:

all the processes by which the sensory input is transformed, reduced, elaborated, stored, recovered, and used... Such terms as sensation, perception, imagery, retention, recall, problem-solving, and thinking, among many others, refer to hypothetical stages or aspects of cognition.

To clarify these processes, cognitive psychologists mapped them out using a metaphor drawn from another boom area of the time: computing. Sensory information was depicted as being received by the brain and then processed via a series of binary yes/no steps, just like the flow diagrams on which many computer programs are based. Today, the models are more sophisticated: rather than a linear flow chart, in which a specified part of the brain deals with inputs one at a time, multiple mental processes occur simultaneously and in tandem across a complex, multi-layered 'neural network'.

Cognitivism is now the dominant strand in contemporary psychology. So what does it have to tell us about anxiety?

Perhaps its key insight is that anxiety – like other emotions – arises from our *appraisal* of a situation. Initially that appraisal, or interpretation, may not be a conscious process; often, it's a case of 'intuition'. Our senses function as an early warning system, picking up on something potentially important and then passing it on to the more rational, deliberative part of our brains to consider. When we detect a threat we're not confident we can handle, we feel anxiety. These latter, conscious thoughts about threat are crucial, and they're what modern psychological treatments for severe anxiety set about changing.

Imagine, for example, that you are woken in the early hours of the morning by a noise downstairs. How you interpret that noise will determine your emotional response. If you decide it's your cat clattering around, you might feel mild irritation at being disturbed before turning over and going back to sleep. But if you believe it may be the sound of a burglar rather than your pet cat, you'll almost certainly be gripped by anxiety and lie awake wondering whether you ought to investigate. It's not the event that determines our emotional state, but rather the way in which we make sense of that event.

The perceived threat can be either external – like the noise in the night – or internal. For example, panic attacks are very often triggered by the mistaken belief that odd but otherwise normal physical sensations – a tightness in the chest, perhaps, or a twinge in an arm – are symptoms of serious illness, such as a heart attack. Indeed, a vicious cycle can be triggered in which the physical manifestations of anxiety (for example, breathlessness, racing heart beat, queasiness) are taken as confirmation of impending collapse or death, which in turn leads to more anxiety. Again, it is the individual's appraisal of these internal signals that is crucial. This means that if you change your thinking, you can change your emotion.

But why is it that one person interprets a little breathlessness after running up stairs as a sign of imminent death, and another scarcely notices it? Why does one person assume a noise in the night is nothing to worry about, and another find themselves paralysed by anxiety? The answer lies in our preconceptions, ideas, and habitual thought processes – what the founder of cognitive behaviour therapy Aaron T. Beck termed 'schematic beliefs'. These schematic beliefs are forged through our life experiences. And they're so ingrained and automatic that we're usually unaware of their existence.

There's nothing inherently negative about cognitive schemas: they allow us to quickly orient ourselves to the situations in which we find ourselves. But Beck discovered that people with anxiety disorders typically possess unhelpful schematic beliefs about themselves, the world around them, and the future (what's known as the *cognitive triad*). For example:

- 'It's always wisest to assume the worst.'
- 'Trouble can strike at any moment; I must always be ready.'
- 'I'm a vulnerable person.'
- 'I must be in control.'



2. Aaron T. Beck is recognized as the father of cognitive behaviour therapy, the most effective form of treatment for anxiety problems. One of the world's leading researchers into psychological disorders, he is Professor Emeritus of Psychiatry at the University of Pennsylvania and founder of the Beck Institute for Cognitive Behavior Therapy. Beck has been acclaimed by the American Psychological Association as 'one of the five most influential psychotherapists of all time'

If we believe such things, we're likely to overestimate the threat facing us, and underestimate our capacity to cope with it.

Anxiety problems, if untreated, can be extremely persistent. But why is this? Anxious people can spend huge amounts of time worrying about events that have never happened to them, and indeed are very unlikely to occur. Why don't they realize that their anxiety is misplaced? Why don't they learn from experience?

This is a question that has received a great deal of attention from clinical cognitive psychologists. One of their key discoveries is that people with anxiety problems adopt a range of strategies – known as *safety behaviours* – designed to prevent the occurrence of whatever it is they fear. So, for example, a person fearful about social situations will seek to avoid them; if this is impossible, they'll fall back on other techniques such as ensuring they attend with a friend, dress as unobtrusively as possible, and keep a low profile. These safety behaviours may reduce anxiety in the short term, but they prevent us discovering that our fearful thoughts are unwarranted – and thus end up strengthening our anxiety.

Researchers have built on Beck's work to identify other *cognitive biases* underlying and sustaining anxiety disorders. Like safety behaviours, patterns of thought and behaviour that seem designed to ward off anxiety only end up tightening its grip. For example, people with anxiety problems are extremely vigilant for possible threats. But because their attention is so focused on potential danger, they tend to overlook those events that don't fit this rather bleak view of the world. This in turn can lead to an overestimation of the likelihood of danger occurring (psychologists call this *threat anticipation*) and lots of false alarms – all of which only fertilizes the ground on which anxiety grows.

There's a tendency to interpret ambiguous events negatively. This is a particular problem given that so many of the situations we encounter are inherently ambiguous, usually because it's so difficult to know how other people really think and feel. A telling example of this *attentional bias* was provided by an experiment that asked participants to spell a series of homophones (words that sound identical but have different meanings), for example: die/dye, slay/sleigh, pain/pane, weak/week, and guilt/gilt. The more anxious a participant was, the greater the likelihood that they would opt for the more threatening spelling of the words.

People with anxiety disorders are also prey to unsettling or even downright alarming images, rather than thoughts. An individual with social anxiety may possess an entirely inaccurate mental image of themselves when in social situations. Rather than thinking things through rationally, they use instinctive *emotional reasoning*. David Clark, the leading cognitive psychologist of anxiety, has explained:

It seems as though a mental model of the patient's observable, social self was laid down after an early traumatic social experience and this model is reactivated in subsequent social encounters.

This matters all the more because research suggests that images exert a much more powerful influence on emotions than do thoughts. As with the other cognitive biases, this susceptibility to mental images enables anxiety to perpetuate and intensify itself.

## Neurobiological theories of anxiety

When it comes to detecting and responding to danger, the [vertebrate] brain just hasn't changed much. In some ways we are emotional lizards.

Joseph LeDoux

What happens in our brains when we feel anxiety? Until the relatively recent development of neuroimaging technology, which allows biochemical activity in the brain to be recorded and pictured, scientists could only conjecture. But remarkable advances have been made in recent years, as we'll see in a moment.

First, however, a word of caution. Neuroscience has come a long way in a short space of time. But even were we to understand exactly how our brains function – and we are still a very long way

indeed from that end point – we wouldn't thereby possess a complete explanation for our experiences. For example, though scientists can now be much more certain than ever about which parts of the brain are involved in anxiety, it is understood that no emotion can be reduced merely to a set of brain events and structures. There are always other levels of explanation, including the behavioural and cognitive aspects we've discussed already in this chapter.

The way in which such levels work has been nicely captured by the neurobiologist Steven Rose:

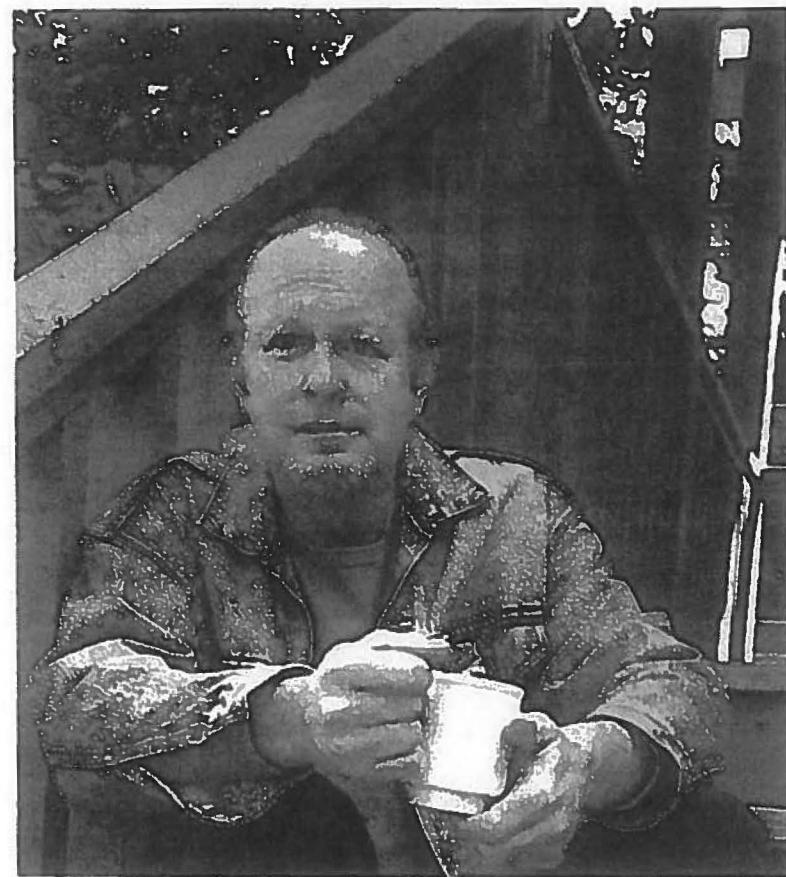
The language of mind and consciousness relates to the language of brains and synapses as English does to Italian; one may translate into the other, though always with some loss of cultural resonance. But we do not have to assign primacy to either.

It's the same with anxiety; scientists approach the issue from different perspectives, but none of those perspectives has priority and all are interrelated. The best theories join up the different levels, and cognitive neuroscience has begun to do that, as we'll now see.

Long before the advent of neuroimaging, scientists had suspected that the brain's *limbic system* plays a major role in the production of emotions. The limbic system in humans closely resembles that found in the first mammals around two hundred million years ago. It is part of the forebrain, a relatively recent part of the brain in evolutionary terms, and is arranged in an approximate circle around the much more ancient brainstem ('limbic' is derived from the Latin for 'border'). Its job is to make a rapid and pre-conscious appraisal of a situation in order to help determine which emotion (and therefore reaction) is appropriate.

Also located within the forebrain are two other key components of our emotional system. The *frontal lobes* of the cerebral cortex lie

directly behind the eyes, and handle many of the tasks we tend to regard as quintessentially human, such as planning, decision-making, language, and conscious thought. It's the frontal lobes that consciously think through and regulate our emotional responses.



Theories of anxiety

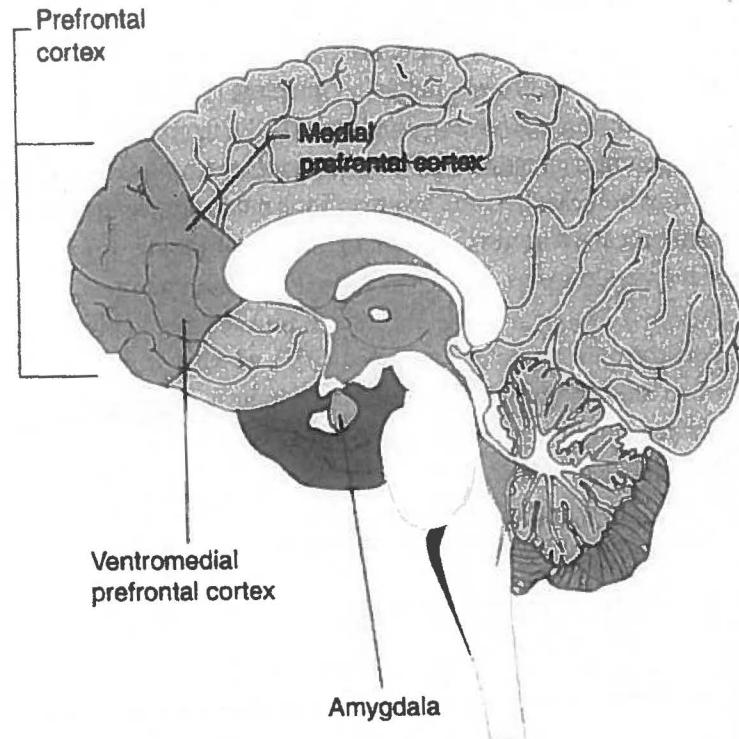
3. Joseph LeDoux (b. 1949) is a US neuroscientist and Director of New York University's Center for Neural Research. LeDoux's ground-breaking research has highlighted the central role played by the brain's amygdala in the experience of anxiety and other emotions. LeDoux is also vocalist and guitarist with The Amygdaloids, a rock band who specialize in 'songs about love and life peppered with insights drawn from research about mind and brain and mental disorders'

In this, the frontal lobes are assisted by the *hippocampus*, which helps form and store contextual memories – vital benchmarks as the frontal lobes figure out how best to react in a given situation.

Joseph LeDoux has been foremost in identifying one particular region of the limbic system as the brain's 'emotional computer', and as especially important in relation to fear and anxiety. That region is the *amygdala*, two small pieces of tissue shaped, in the view of early scientists, like almond seeds (*amygdala* is the Latin for 'almond seed'). The amygdala seems to be responsible for fear reactions in all species that have one, including reptiles and birds as well as mammals. It houses a store of *unconscious* fear memories, meaning that we can become anxious without knowing why. And it is extremely well connected to other parts of the brain. LeDoux has written:

The amygdala is like the hub of a wheel. It receives low-level inputs from sensory-specific regions of the thalamus [another area of the forebrain], higher level information from sensory-specific [areas of the cerebral] cortex, and still higher level (sensory independent) information about the general situation from the hippocampal formation. Through such connections, the amygdala is able to process the emotional significance of individual stimuli as well as complex situations. The amygdala is, in essence, involved in the appraisal of emotional meaning.

The amygdala's connections don't end there. Through the hypothalamus, it can influence the basic processes that comprise the autonomic nervous system (for example, breathing, blood pressure, and body temperature). As we saw in Chapter 1, changes to the autonomic nervous system when we're anxious can lead to a wide range of physical effects including elevated heart rate, dilated pupils, and altered breathing.



4. The brain, showing the location of the amygdala

The amygdala is able to make an appraisal of a potentially threatening situation extremely rapidly – so rapidly, in fact, that we may not realize why we're suddenly feeling afraid. LeDoux has suggested that the amygdala offers a 'low road' to fear responses, supplying a 'quick and dirty' reaction to events that is designed to save our life first and ask questions later. The 'high road', by contrast, involves sensory information being processed by the frontal lobes (the part of the brain responsible for thinking things through) *before* it reaches the amygdala. The high road is more accurate, but slower. As you might imagine, both routes have their advantages and disadvantages.

Important though the amygdala seems to be, we shouldn't forget that anxiety – just like any other emotion – is the result of an extremely complex process involving multiple regions of the brain. As we've mentioned, these regions include the frontal lobes and the hippocampus; also involved is the *insula*, a part of the cerebral cortex that helps us become aware of internal feelings, and several neurochemicals. Among the most significant of these neurochemicals are:

- Corticotropin-releasing hormone (CRH), which is triggered when the amygdala detects danger and in turn sparks the release of stress hormones to ensure that we're ready for action in the face of danger; and
- Gamma aminobutyric acid (GABA), which calms us down when we're anxious.

Given that anxiety is the result of a system rather than one element, what happens when that system malfunctions? LeDoux and others have speculated that people with anxiety disorders may possess:

- An overactive amygdala, and/or;
- insufficiently active frontal lobes, and/or;
- a hippocampus that doesn't pinpoint exactly which elements in a situation on the basis of past experience signal danger, meaning that they may become anxious unnecessarily.

The amygdala, as we've seen, is a kind of rapid-response unit, triggering 'just in case' fear reactions that are then appraised by the more deliberative areas of the brain. But if the frontal lobes, for example, can't make themselves heard over the noise emanating from the amygdala, we're likely to experience unnecessary anxiety over what are essentially false alarms.

There's evidence that persistent anxiety (through the effects of stress hormones) can alter the way in which the brain functions, for example, by impairing short-term memory or even shrinking the size of the hippocampus. These effects are usually reversible, but in the long term they can become permanent.

In the next chapter, we'll look at two more perspectives on anxiety. How much of a role do life experiences play in making us vulnerable to anxiety, and how significant are genetic factors?

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