



WHY WE DO WHAT WE DO

Understanding Our Brain to Get the Best
Out of Ourselves and Others



DR. HELENA BOSCHI

LANSONS

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Testimonials

'With her trademark charismatic writing style, Helena offers in her book a whole range of practical tips for team leaders, based on the best available science, on how we can communicate with colleagues to promote a productive and positive working environment.'

Ben Bruton
Partner, Winston Strawn LLP

'Helena has done a wonderful job in making the complex science of the brain and how it works understandable and useful for everyday living. What Helena shares in the book helps us understand and answer why. . .'

Regina Godvin
World Account Manager, Givaudan Flavours and Fragrances Inc.

'Working with Children and Young People on a daily basis I need to understand how their brains work and why they behave the way they do. Helena's book does just that. It's extremely insightful and is a useful tool for me to use to excel in my role.'

Jane Grieve
Children & Young Persons Police Officer, Essex Police

'An easy yet insightful read explaining how to keep learning and stay receptive to new ideas, whilst providing helpful tips for a healthier brain.'

Denise Jagger
Pro Chancellor, University of York & Director Bellway PLC

'Helena has captured the most difficult subject to comprehend and made it possible for everyone who reads her book to understand the brain and use it for everyday life. The book has helped me to transform myself and my business. I can't thank you enough!'

Erick Kervaon
General Manager, Bingham Riverhouse Hotel

'As a psychotherapist I have found this book an invaluable tool as it explains the functioning of the brain in such a clear and concise way. Helena has managed to write about the brain in a style that is easy to understand, and I would recommend this book to anyone who wants to know more about this fascinating subject.'

Tracy Northampton
UKCP/BACP Accredited Psychotherapist

'I can't think of a better time to explore ways in which we maximize our ability and in so doing, take greater control of our destiny. This book can get us there.'

Eileen Redmond-Macken
Private Banking, Investec Bank PLC

'Helena is hugely talented in simplifying our understanding of our most complex organ: the human brain. This book is supported by a multitude of examples from scientific research. It is a must read for anyone who is interested in the psychology of human behaviour and in understanding what influences our perceptions and the way we interact with others.'

Karim Smaira
Founder and CEO, Genpharm Services

'Such a brilliant book, both interesting personally but above all of practical value in business. I applied several of the insights and seen tangible results. For example, we reversed the order of our wine list as a result of the section on anchoring, and wine sales jumped 15% overnight.'

Simon Thomas
CEO, The Hippodrome Casino

'I cannot recommend this fascinating book highly enough! Presented in a clear, logical and accessible way, it has enabled me to understand the most complex organ in my body to new and enlightening depths. It also offers a host of practical ways to apply evidence-based neuroscience to our personal lives in order to enhance our communication and relationships with others, as well as to improve our own mental and physical well-being. I'm already reaping the benefits - read this book and so will you!' Rachel Walker

Clinical Scientist, Independent Vascular Diagnostics Ltd

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About the Author



Helena Boschi is a psychologist specialising in applied neuroscience.

Helena is a business practitioner turned practical neuroscientist and has spent many years in listed multinational companies working in sales, marketing, talent management, organisation design and leadership development. She is uniquely placed to bring the world of neuroscience to the business context in a pragmatic and relevant way, using her knowledge of what businesses and business leaders need.

Organisations worldwide now use Helena as a speaker and an educator to help them understand and benefit from neuroscience that explains why we do what we do. She works closely with her clients to shape new thinking and design creative learning initiatives, particularly in the areas of leadership and team development, intercultural communication and organisational change. Helena is particularly passionate about improving physical and psychological wellbeing in a world that is placing increasing demands on our biological and cognitive resources.

Offering a range of compelling messages that are backed by science, grounded in the real world and communicated in a style that engages her audiences, Helena is dedicated to encouraging people to take greater responsibility for the long-term functioning and health of their brain and the brains of those around them. She is a member of the British Psychological Society.

If you would like to contact Helena about speaking or presenting, please email her at: helena@chequeredleopard.com

About Lansons

Lansons is a leading reputation management and public relations consultancy advising companies, organisations and governments across the world.

Organisations with the best reputations outperform rivals in a myriad of tangible ways from recruiting higher quality people to succeeding with smaller marketing budgets to exerting greater influence over governments. We believe that every organisation should consciously manage its reputation, not just in times of crisis.

Formed in 1989, we've won over 80 awards for our work. We lead our industry on gender equality, giving back, employee ownership and being a great place to work.

Our approach is to challenge thinking and innovate, helping clients communicate more effectively. Applying neuroscience to communications is an important part of this. That's why we've supported Dr Helena Boschi in bringing this book to a global audience.

To find out more about Lansons visit www.lansons.com.

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I am particularly indebted to Lansons, the reputation management consultancy that has promoted this book and to Clare Parsons and Tony Langham, Lansons' founders, for their continued and positive support. In particular, Suzanne Ellis, Lansons' Director in Communications for Change and Transformation, has shown faith in me and the book from the beginning. Suzanne urged me to write this book and has always been an invaluable source of energy and guidance. During the course of our respective professional engagements and work together, Suzanne and I have increasingly recognised the critical importance of brain health and wellbeing throughout life. Special thanks must go to Emma Read, who has been an invaluable pair of eyes, and Jennifer Ryle for her masterful designs.

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Preface

Why this book?

The human brain today is always on. Technology is everywhere, connecting and consuming us. It has transformed the way we think, communicate and even live. We rely on being plugged in to instant information and real-time feedback. We no longer have to wait for anything: technology has enabled us to have it all now. We can shop, read and watch movies and television programmes whenever we want. We are even able to choose a potential partner simply by swiping right. We are increasingly defined by speedy responses and even faster results. Immediacy is what we all now expect and demand.

The ramifications of this modern world are both good and bad. A world without search engines and direct access to data is unimaginable today: we can automate tasks, coordinate activity, exchange information, direct our own education and read others' opinions at the touch of a button. The downside is that we are subjected to the whims of a fickle, virtual network that can validate and endorse, or demean and destroy. Our identity and success are forged by social opinion and follower numbers, where relationships are tenuous and often temporary.

Humans have an amazing ability to transform their environment. We only need to look back over the last 50 years to see vast differences in the way we live and communicate. But as change has accelerated, so too has our drive to innovate. The problem is that the same *humanness* responsible for all this discovery is simultaneously limited in its ability to cope with the world that we have now fashioned for ourselves.

Despite a world that is speeding up around us, we remain essentially social, emotional, sensual and flawed beings, hampered by a maladaptive biology. Our brain's primary role, which is to keep us alive and functioning, has not yet adjusted well enough to deal with a now-constant bombardment of information. Put simply, we do not have the brainpower to deal with the number of inputs we receive.

And while every advance and latest innovation in technology gives us the illusion of greater efficiency and control over our life, this comes at a cost. Our instinct to survive means that we are naturally prone to interruption – we are attuned to switch our attention to anything that may historically have constituted a threat to life – but incessant data means that we can never switch off. We feel obliged to be responsive and productive, we make rapid decisions, we seek immediate rewards and we deny ourselves the space and time to slow down, breathe deeply and build long-term, meaningful relationships.

Our brain deals with this continuous loop of anticipation, uncertainty and anxiety by releasing chemicals to protect us from any potential threat or danger and to keep us alive. These chemicals place us in a state of alertness, tension and stress, which influences our view of the world and distorts our thinking. And we cannot think clearly when we are focused on survival.

Our modern lifestyle is not helping. We are sitting too much, and exercising and sleeping too little. Because our bodies are not active and mobile, we are witnessing an increase in depression, stress, obesity and degenerative illnesses such as dementia.

And so, as technology frees up effort in one area, we need to work harder to manage the fallout in another.

The good news is that we can all develop strategies and techniques to help us lead happier, healthier and more fulfilling lives. Learning about how our brain functions is an important first step.

Ongoing research in neuroscience provides us with valuable insights into why we do what we do. This book presents some of these insights and offers ideas as to how to apply them to everyday life.

How to read this book

The intention is that this book should strike a balance between knowledge and application by combining scientific research with concrete examples as well as illustrative stories. It is designed to be visual, practical and easy to read.

Each chapter is written as a stand-alone guide to a particular brain area and concludes with five tips for improving brainpower in that area. Additional references to specific studies are also provided for those who would like to explore these in more depth.

It is important to point out that, although the chapters are organised under separate, recognisable headings, it would be too simplistic to suggest that the brain works in a similarly clear-cut way. There are therefore inevitably some areas

of overlap among chapters, which reflect the extensive activity and multifaceted nature of our brain.

As neuroscience continues to gain momentum, more studies will undoubtedly be published. In the meantime, I hope that this book will whet your appetite and leave you wanting to find out more.

Remember: it is always valuable to ask ‘Why?’

Why do we need to keep our brain in balance?

Why are we emotional rather than rational?

Why do we not remember accurately?

Why can we not multitask?

Why does our brain love (and hate) certain words?

Why do we not see the truth?

Why are we all biased?

Why do we need to reignite our creativity?

Why do most change efforts fail?

Why do we need to manage our stress?

Why do leaders need to learn about the brain?

Why do we need to improve our lifestyle and daily habits?

Chapter overview

Chapter 1 provides a quick look at our brain – how it is structured and how it functions – and the chapter also considers male/female differences and the nature/nurture debate.

Chapter 2 explores our emotional brain; why we have emotions and how our emotions affect our memories.

Chapter 3 looks at how memory works in our brain, the different types of memory we store and how to improve our ability to remember.

Chapter 4 discusses our attentional system, its strengths and limitations, and why focus is essential to learning.

Chapter 5 considers the impact and use of language, the power of certain words and the endurance of storytelling.

Chapter 6 offers insights into visual perception, explaining how our brain ‘sees’ and why we are susceptible to visual illusions.

Chapter 7 describes some of the biases that we carry within us and discusses why we have developed mental shortcuts to interpret information.

Chapter 8 enters the world of the creative brain and provides some insights into how to reignite the creative spark that we all carry within us.

Chapter 9 discusses the impact of change on our brain, explaining how habits are formed and how we can minimise the pain of change.

Chapter 10 provides information about what stress is doing to us in today’s world. It also describes the different symptoms associated with stress, and offers some methods of handling stressful situations.

Chapter 11 looks at leadership and how effective leaders need an understanding of the brain in order to get the best out of the people they lead.

Chapter 12 offers a glimpse into our modern lifestyle and considers how we should protect our brain against daily challenges, with a specific focus on sleep, exercise and food.

**Sitting on our
shoulders is
the most
complicated object
in the known
universe.**

MICHIO KAKU

Theoretical physicist and futurist (1947–)

Our Brain

ABOUT THIS CHAPTER

The brain is the basis of everything we do: how we behave, feel, remember, pay attention, create, change, influence and ultimately live. Learning about how our brain functions is an important starting point to understanding why we do what we do.

Even though it only weighs around one and a half kilograms, our brain is complicated. With the advent of neuroimaging techniques we are now able to see inside the brain and explore its function and structure in greater depth. But despite new advances in neuroscience, neurobiology and neuropsychology, the brain remains the most mysterious, complex and relatively unknown organ in the human body.

This chapter provides an introductory overview of the main structures and functions of the human brain. It explains how our brain helps us respond to the world around us and keeps our system in balance. Some insights are offered into male/female brain differences, whilst also acknowledging the influences of our environment and upbringing.

As we begin to understand more about how our brain works, we become more aware of our own thoughts, responses, behaviours and emotions. We also become better equipped to get the best out of our brainpower in the future.

Part 1: The science explained

The key function of our brain is to keep us alive. This means that our brain needs to be able to anticipate what is safe or harmful in our environment.

In other words, our brain is our *personal prediction machine*. It is constantly scanning and processing the world around us to help us respond appropriately.

Why we need to keep it all in balance

The brain maintains a finely tuned internal balance in order to regulate our heartbeat, breathing, temperature, water, hormonal release and sugar levels. This internal balance is known as *homeostasis*, meaning ‘same state’.

Our internal body environment is kept steady and stable despite changes in our external surroundings. This balancing act works on what is called a *negative feedback loop* (see Figure 1.1): when the level of something rises, our brain’s control systems reduce that level, and when the level of something falls, our brain’s control systems raise that level.

For example, if we are cold, we shiver in order to generate heat, and if we become too hot, we sweat in order to cool down.

Our brain works hard to maintain this balance and to keep our system functioning effectively.

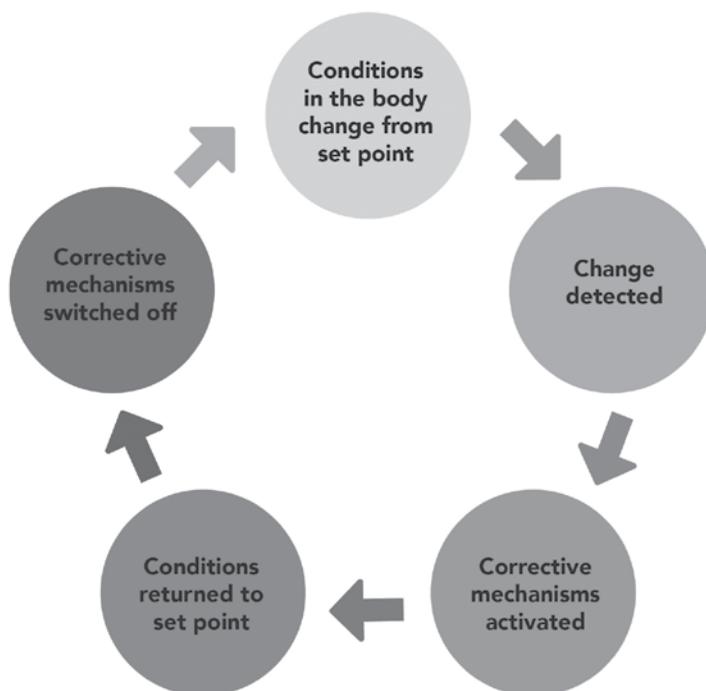


FIGURE 1.1: The negative feedback loop

Our brain, neurons and synapses

Our brain represents just two percent of our total body weight and is made up of approximately 100 billion nerve cells, which are known as *neurons*.

Each neuron can make between 1,000 and 10,000 connections, or *synapses*, with other neurons. Our brain's ability to form new connections, constantly reorganising itself and changing its pattern and shape, is known as *neuroplasticity*. We have two different types of neurons – *sensory* and *motor*:

Sensory neurons carry information from our sensory organs – eyes, ears, nose, tongue and skin – to the brain.

Motor neurons carry messages away from the brain and spinal cord to our muscles.

Our brain has three main parts: *forebrain*, *midbrain* and *hindbrain*. The midbrain and hindbrain make up the brain stem and connect the forebrain to the spinal cord. The forebrain contains the *cerebrum*, the largest part of the brain, which plays a critical role in processing information.

Our four lobes . . .

The **cerebrum** is divided into four *lobes* (see Figures 1.2 and 1.3). Although these are all interconnected, each lobe is associated with different functions.

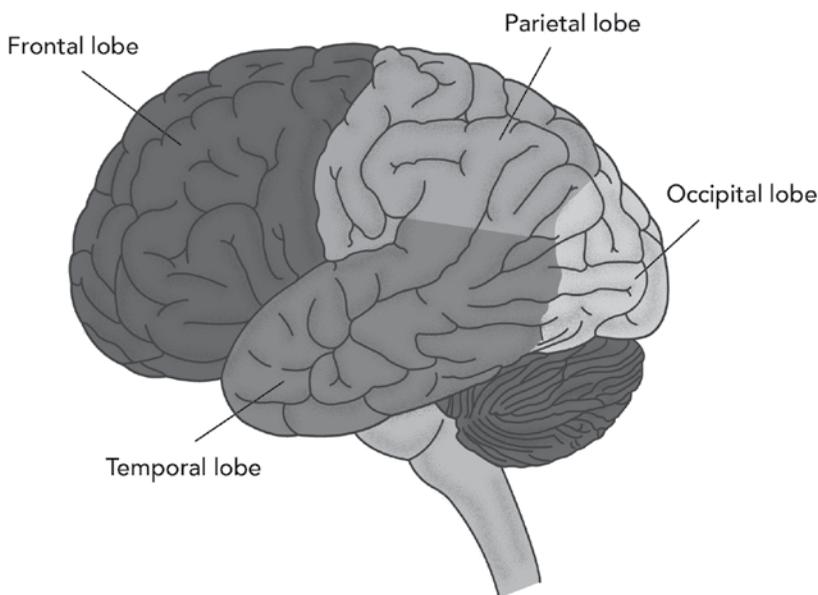


FIGURE 1.2: The lobes of the brain

Frontal lobe	Processes higher cognitive functions and decision-making. This is the centre of our brain's executive functioning and manages complex mental and behavioural responses to the environment.
Temporal lobe	Controls our hearing and processes memories, integrates them with our senses and emotions and regulates our endocrine system, which releases our hormones.
Parietal lobe	Processes information about temperature, taste, touch, movement, reading and spatial orientation.
Occipital lobe	Primarily responsible for vision and the interpretation of information taken in by the eyes.

FIGURE 1.3: Our four lobes

Our lobes work together to enable our brain to operate as a whole and to adapt constantly to keep us functioning. If we lose a sense such as sight, another sense such as hearing gets stronger. The *seeing* part of the brain is then used to process sound.

. . . and two hemispheres

Most mental functions are distributed across the *right* and *left* sides, or *hemispheres*, of our brain. Certain mental processes and tasks are specialised to either one hemisphere or the other (see Figure 1.4). This is known as *lateralisation* of brain function. Scientists believe that this is our brain's way of being more efficient: by avoiding duplication, we optimise our available brainpower.

Our knowledge of the brain's hemispheres can be largely credited to the work of Dr Roger Sperry during the 1960s. Dr Sperry examined the way our brain's hemispheres operate both independently and together and, in 1981, was awarded the Nobel Prize in Physiology or Medicine for his work in this area.

The **left hemisphere** normally directs logical, analytical, mathematical and verbal tasks.

The **right hemisphere** is generally more concerned with music, emotion and tonality, facial recognition, visual imagery and abstract information.

The right hemisphere controls the muscles on the left side of our body, while the left hemisphere controls the muscles on the right side. Damage to one side of the brain, such as that caused by a stroke, affects the opposite side of the body.

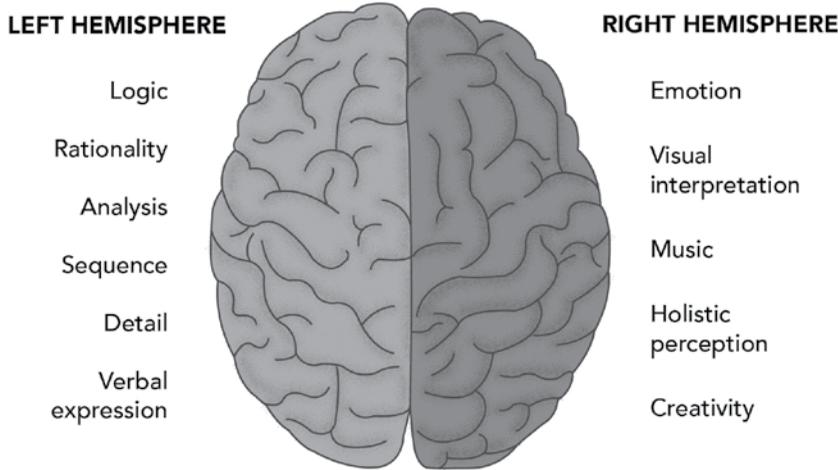


FIGURE 1.4: Our two hemispheres and their roles

Connecting the two hemispheres is a network of fibres, called the *corpus callosum*, which enables information to be carried between the hemispheres. The primary function of the corpus callosum is to ensure that our brain functions as one integrated and cohesive unit.

How neurons communicate with each other

All of our neurons pass on information to other neurons. In order to do this, our brain communicates on an electrical as well as a chemical level, involving ions such as sodium, potassium and calcium. Communication between neurons is the core of all our thoughts, emotions and behaviours.

Any new experience stimulates an electrical impulse within a neuron. Electricity cannot travel across a gap or space, called the *synaptic cleft*, so when this impulse reaches the end of the neuron the information has to be relayed by chemicals, known as *neurotransmitters*.

Neurotransmitters are stored in small compartments called *vesicles*. Each vesicle tends to hold one type of neurotransmitter. The neurotransmitters travel in their vesicles to the end of the neuron where they wait to cross over the gap. At the right time, the neurotransmitter is emptied into the gap and travels across to the other neuron. When neurotransmitters travel between neurons, they form a connection with another neuron (see Figure 1.5).

All of this happens with impressive speed and precision.

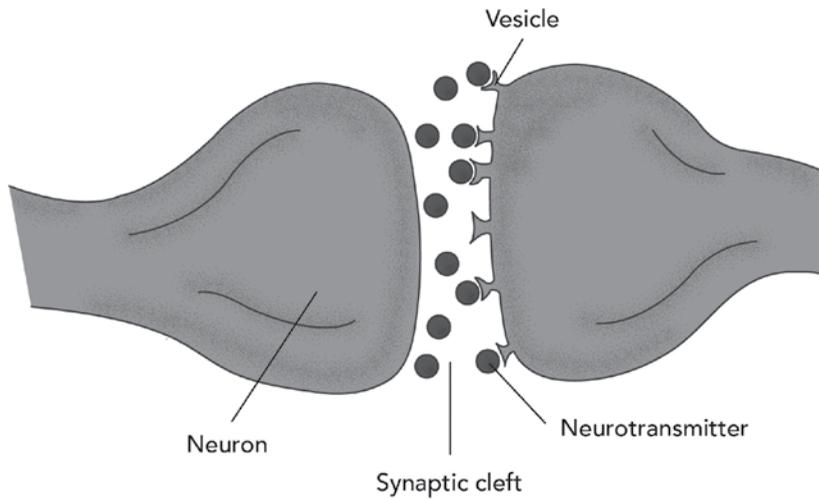


FIGURE 1.5: Neurons and neurotransmitters

Neurotransmitters affect our mood, memory and wellbeing. They are effectively our *chemicals of emotion*.

There are two types of neurotransmitters: *excitatory* and *inhibitory*.

Excitatory neurotransmitters stimulate the brain.

Inhibitory neurotransmitters calm the brain and balance brain stimulation.

The impact of neurotransmitters on our health is the focus of ongoing scientific research. Problems with even minor aspects of their release process from one neuron to another have been linked to many brain disorders and nervous system diseases, including depression, autism, schizophrenia, dementia and epilepsy.

The role and symptoms of deficiency of some of these neurotransmitters are described in Figure 1.6.

Chapter 12, *Our Brain and Lifestyle*, discusses how certain foods boost the performance of neurotransmitters in our brain.

Our nervous system

The brain controls our nervous system, which regulates how we respond and adjust to the world around us.

Neurotransmitter	Role	Some symptoms of deficiency
Serotonin	Inhibitory neurotransmitter. Plays an important role in regulating mood, happiness, relaxation, appetite, memory, bowel function, learning and hormonal release.	Depressed mood, anxiety, panic attacks, low energy, sleeping problems, feeling tense and irritable, impaired memory and concentration.
Oxytocin	Also known as the <i>cuddle chemical</i> or <i>moral molecule</i> . Plays a key role in maternal bonding, childbirth, social affiliation and increases romantic attachment and empathy. Makes us more sensitive to social cues around us.	Anxiety, stress, feelings of disconnect with others, depression, loss of appetite, greater sensitivity to pain. Used to accelerate childbirth and improve social engagement in people with autism.
Dopamine	Both an excitatory and inhibitory neurotransmitter. Responsible for movement, memory, pleasurable reward, attention, desire and drive to get things done. Known as our <i>motivation molecule</i> . Controls movement and posture.	Memory problems, poor concentration, difficulty initiating or completing tasks, lack of energy, lack of motivation, addictions, cravings, compulsions, a loss of satisfaction and libido. Too little dopamine is implicated in Parkinson's Disease.
Glutamate	Major excitatory neurotransmitter in our brain. Involved in cognition, memory and learning.	Insomnia, problems concentrating, mental exhaustion and depleted energy.
GABA	Inhibitory neurotransmitter. GABA (<i>gamma-aminobutyric acid</i>) acts as a natural sedative and tranquilliser and calms nervous activity. Contributes to motor control and vision.	Anxiety disorders, racing thoughts, bipolar disorder, mania, poor impulse control, panic attacks, cold hands and shortness of breath.
Acetylcholine	Widely distributed excitatory neurotransmitter. Major impact on wakefulness, attentiveness and arousal. Needed to turn short-term memories into long-term ones. Released to activate muscles. (Botox is a neurotoxin that blocks the effect of acetylcholine, preventing the facial muscles from moving.)	Low energy levels, memory loss, learning problems, muscle aches, cognitive decline. People with Alzheimer's Disease have altered levels of acetylcholine. Also implicated in Parkinson's Disease.
Noradrenaline	Excitatory neurotransmitter. Triggers changes in the body in response to stress (increased oxygen, heart rate and glucose) to raise our alertness and <i>fight or flight</i> capacity. Important for attentiveness, emotions, dreaming and learning.	Depression, loss of alertness, memory problems, lack of energy, focus and motivation.

FIGURE 1.6: Some neurotransmitters and their roles

Function of the nervous system

The nervous system has three main functions (see Figure 1.7):

-
1. *Sensory* passing information from our senses to the central nervous system for processing.
 2. *Integrating* using the sensory signals for decision-making or the formation of new memories.
 3. *Motor* activating our muscles and glands.
-

FIGURE 1.7: Functions of our nervous system

There are two parts to our nervous system (see Figure 1.8):

1. *Central nervous system* (brain and spinal cord).
2. *Peripheral nervous system* (cranial nerves branching from the brain, spinal nerves branching from the spinal cord and rest of the body).

Messages are carried between the central nervous system and the peripheral nervous system to activate the muscles and glands.

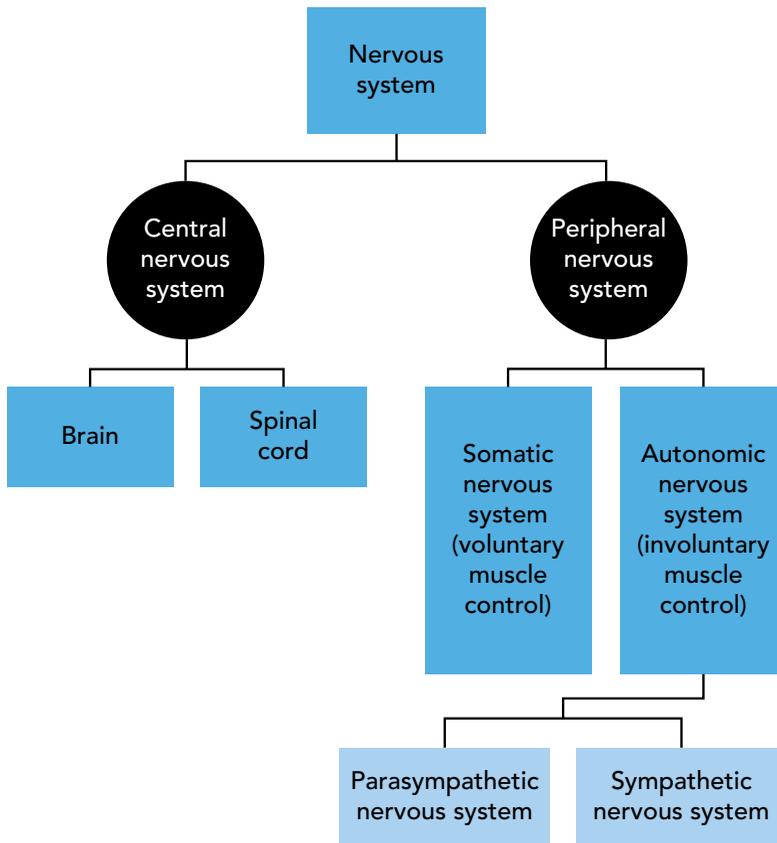


FIGURE 1.8: Our nervous system