

NEURODIVERSITY

By

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**Akili ni nywele kila
mtu ana zake.**

Intelligence is like hair,
everyone has their own.

Swahili proverb



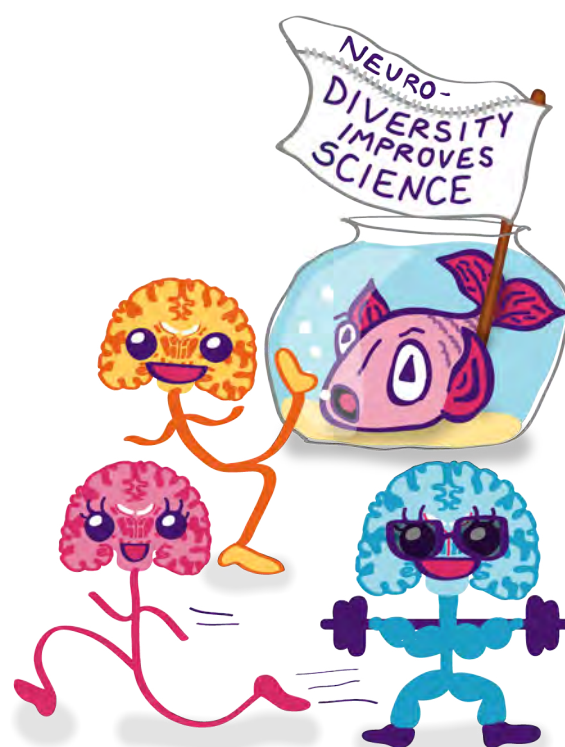


DIFFERENT BRAINS WORK DIFFERENTLY

Humans are wonderfully diverse, in many ways. Just like our bodies come in all shapes and sizes, our brains are all built differently too. **Neurodiversity** describes the diverse ways in which our brains work because of differences in our brain physiologies. Each of us has a unique **neurotype** or **mental skill set** that shapes how we perceive and interact with the world. But, because we can't see people's brains, we tend to think that everyone's brain works the same way. As future scientists, it is especially important to understand, accept and value neurodiversity because it is an essential part of what drives scientific progress.

Different neurotypes can be broadly classified as either **neurotypical** or **neurodivergent**. Between 10 and 20% of people are neurodivergent, meaning that their brains process information differently from the neurotypical majority. Different brains are built for different things, just like some bodies are built for running marathons and others are better at dancing or playing soccer. There are countless different ways to think, learn, feel and communicate – none of them any better or worse than another. The problem is that society is designed for neurotypical brains. And even though there are so many kinds of brains out there, we are seldom given words to understand them.

That's why the **language of neurodiversity** is so important. Whether you are neurotypical, neurodivergent or not sure where you fit, the language of neurodiversity gives us words to explain how our brains work differently. It





helps us to recognise the ways in which the world works for us or against us in so many ways. And it can help all of us to figure out how our brains are built and what they were made for.

In this chapter, we describe the strengths and challenges of some different neurotypes. We also explore the difficulties that neurodivergent students may experience at university and practical ways to accommodate these difficulties so that all neurotypes can succeed.

WHAT IS NEURODIVERGENCE?

Neurodiversity arises from differences in brain **physiology** that are shaped by interactions between your genes and your environment [1]. Some people are born with differences in neurology, often inherited from their parents. Your brain can also change in response to environmental factors like illness, malnutrition, trauma or early life stress. Neurodivergence comes in many different forms, each with specific strengths and support needs. All forms of neurodivergence are highly **variable**, meaning that they differ from one person to the next [2]. They are also **dynamic**, because traits can vary across different contexts or life stages. And to make things more complex, different conditions can **overlap** with each other, because one person can have more than one kind of neurodivergence. Figure 1 provides an overview of some types of neurodivergence and a few of their associated traits, but keep in mind that everyone experiences neurodivergence differently.

Figure 1: The seesaw of neurodivergence: strengths and challenges

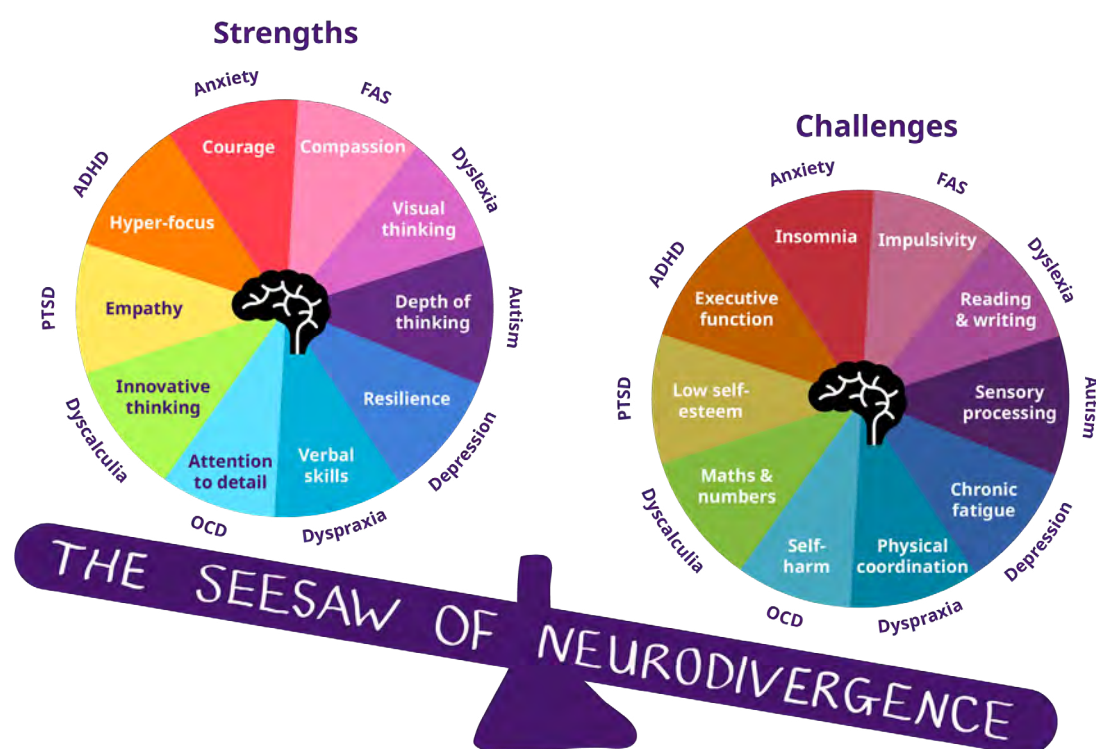


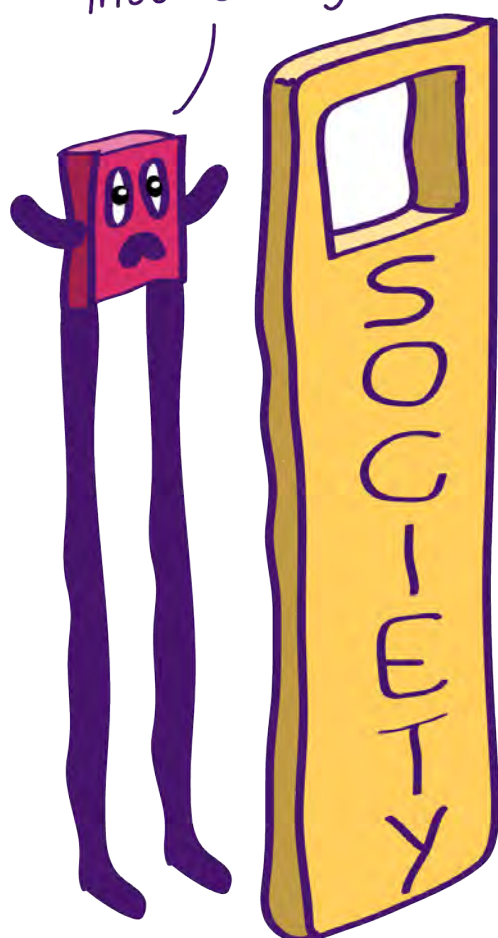
Figure 1 depicts neurodivergence as a seesaw, in that it comes with both ups and downs. This is because the same brain-wiring that makes someone good at one thing means they find other things difficult.

On the upside, neurodivergent conditions often come with unique strengths, such as attention to detail, creativity, hyper-focus and empathy, among others [3]. These skills enable neurodivergent people to develop novel strategies for information processing, problem solving and abstract thinking. This capacity for out-the-box thinking means that neurodivergent people are often able to make immensely valuable contributions to scientific research and society as a whole. On the downside, neurodivergent conditions carry associated challenges (such as chronic fatigue, anxiety or difficulty with numbers, reading or writing) that can make daily functioning more challenging.



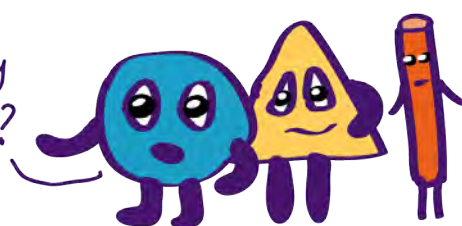
Historically, the challenges associated with divergent neurotypes meant that they were largely considered disorders marked by brain dysfunction [4]. That's why they often come with negative labels. The prefix *dys* means difficulty – so dyscalculia is difficulty with calculations, dyslexia is difficulty with words (*lexis* in Latin) and dysgraphia is difficulty with writing (*graphia* in Greek). But think about it – have you ever heard of words like 'dysmusical' for people who can't sing, 'dysporting' for people who can't catch a ball, or 'creative disorder' for people who can't draw? These words don't exist because society views musical, sporting and creative talents to be optional extras, rather than essential parts of daily life. In contrast, everyone is expected to read, communicate and work with numbers, which are skills that neurotypical people happen to find straightforward. Just because the world is built for a neurotypical brain, it doesn't mean that other neurotypes are wrong – the same way it isn't wrong to be left-handed in a world built for the right-handed majority.

You'll have to
change to fit
into society!



Today, we understand that the difficulties associated with neurodivergence are often due to a **mismatch** between a divergent brain and our neurotypical society [5]. Still, the unique strengths of neurodivergence often go unrecognised in our neurotypical social, academic and professional arenas. What's more, navigating a neurotypical world with a neurodivergent brain presents some hefty challenges. As you will see in the following sections, these challenges can be compounded by the stress of navigating the university environment.

Or society
can change?

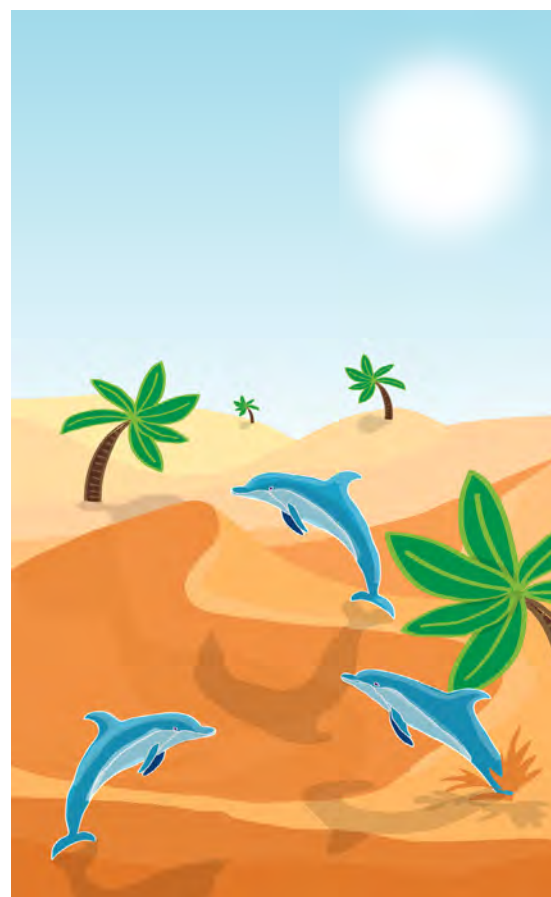




DOLPHINS IN THE DESERT

Have you ever heard the phrase 'like a fish out of water'? Being neurodivergent at university can feel like being a dolphin in the desert. Of course, the desert is tough for everyone! But some students are like camels in the desert – they are wired with the underlying neurophysiology to survive (and even thrive), though they might not know it. But for students who are neurodivergent, the desert of tertiary education can be a hostile landscape to navigate.

If you ever feel like a dolphin in the university desert, this chapter may help you to understand your challenges and find resources that are available to help you. Remember, there are many different fish in every sea and that's certainly true when it comes to the sea of neurodiversity; one person's experience could be the *exact opposite* of somebody else's! Let's explore a few aspects of neurodivergence and how they might respond to the unique stressors presented by university.



MASKING AND BURNOUT

Most people with neurotypical brains are like whizz kids in daily functioning. Without knowing it, they automatically form habits and systems that serve as an internal GPS through space and time. Neurodivergent people often have to consciously control a whole host of things that neurotypical people do automatically. These can range from executive functioning processes (like attentional control, organisation and emotional regulation) to reading social cues or filtering sensory stimuli. The energy

Executive functioning refers to processes regulated by the prefrontal cortex involved in impulse control, emotional regulation, flexible thinking, task initiation, working memory, organization and self-monitoring.



required to sustain all of these background processes just to get through everyday interactions and daily tasks is immense.

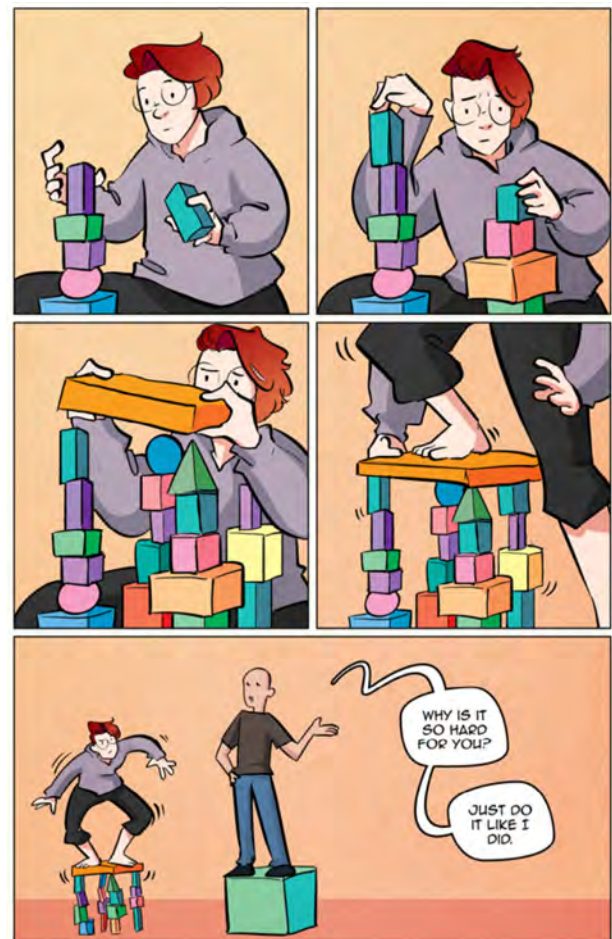
Masking or camouflaging refers to strategies that are developed to hide neurodivergent traits and compensate for social or academic difficulties [6]. Think of a dolphin camouflaging itself as a camel in the desert – not surprisingly, it would require a lot of effort and cognitive capacity to pull off!

All of this effort leads to a huge energy expenditure, which frequently culminates in burnout. In the context of neurodivergence, burnout refers to chronic exhaustion and loss of function resulting from a mismatch between expectations and abilities. With burnout, everything feels harder than before and you often feel like you just can't keep up anymore.

At the same time, burnout exacerbates neurodivergent traits like executive dysfunction and emotional dysregulation. This combination of factors can leave neurodivergent people highly vulnerable to social isolation in the midst of extreme psychological distress, with no way to understand what is happening to them and no words to communicate their situation.

Big life stage transitions like the one from high school to university are one of the most common triggers of burnout. At the same time, university often demands an increase in the degree and frequency of masking just to get by. What's more, academic and social skill sets become increasingly intertwined: academic success relies on social networks built on interactions with classmates, tutors and lecturers. Of course, high school was also better suited to neurotypical camels, but it provided structure and guidance that

I drew flowcharts to try to understand people and emotions and how to have friendships and I did research on how to have conversations. But other people just seemed to do things without the whole thought process that I have to go through.



(Source: [howbabycomic.com](https://www.howbabycomic.com))



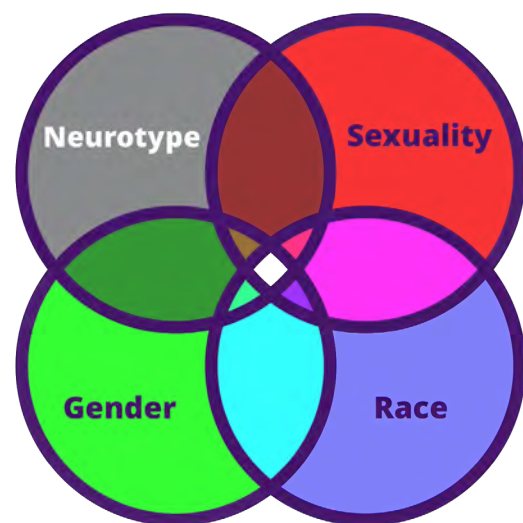
may have alleviated some of the difficulties encountered by neurodivergent students. The challenges of increased independence and responsibility at university might be compounded by difficulties with executive functioning and self-regulation. Some people might even feel that keeping track of lecture schedules, budgets and bus routes is more difficult than a PhD in astrophysics.

If you ever feel disheartened because simple things just feel so hard, know that you are not alone. With practice, you will learn how to solve the equations of daily life. You might just need some extra tools or a little more time. It helps to be patient and kind with yourself while you are still figuring it all out, especially because your neurotype intersects with other aspects of your identity.

I try really hard to stay organised, but my mind feels like spaghetti.

NEURODIVERSITY AND INTERSECTIONALITY

The *Discrimination and science* chapter discussed the intersectionality that arises from the overlap between different aspects of our identities. We can now add neurotype as another aspect of intersectionality. Neurodivergent traits have different consequences for people, depending on other aspects of their backgrounds and identities. For example, due to unconscious biases, people are more likely to interpret neurodivergent traits more negatively in people of colour [7, 8]. Neurodivergent children are impacted greatly by the accessibility of healthcare and education, which remains notoriously unequal in South Africa [9, 10, 11]. What's more, many





neurodivergent people struggle with reading or writing – a challenge which is compounded if they have to take assessments in a second or third language.

The intersectional nature of neurodivergence is highly relevant to the transition to university. Students who are far from home may feel isolated and overwhelmed [12]. This is doubly stressful for neurodivergent students, who struggle to feel a sense of belonging, even at home with friends and family [13]. This is triply stressful if they are also experiencing culture shock as a result of being in an alien environment. Black and international students may feel pressure to assimilate into a historically white university culture and use strategies like code-switching, speaking in a second or third language, or changing how they dress, eat or talk in order to blend in [14]. These constant efforts are similar to neurodivergent masking and the strain of masking on multiple levels adds up over time.

It's going to take some time before academic institutions are more accessible on so many levels. The truth is that large-scale societal restructuring is needed to achieve this – not conceptual reframing or 'thinking about things differently'. While it doesn't change everything, the lens of neurodiversity might change *something* about how you understand yourself and each other during your years at university. Sometimes just understanding your neurotype can make all the difference.

To code switch is to change from one language or cultural norm (code) to another, or from one way of behaving to another, in order to be more 'acceptable' to the groups that we are with.



KNOW YOUR NEUROTYPED

Many forms of neurodivergence are under-diagnosed in the South African healthcare system and widely misunderstood by society at large. As a result, many neurodivergent students are often unaware that their experience of the world differs from the neurotypical norm. Understanding your neurotype is key to harnessing your strengths, removing shame surrounding your weaknesses and getting help with your challenges. Getting a formal diagnosis can be lifechanging, as Jes Graham describes below.

The benefits of a diagnosis

Jes Graham

Proudly bipolar



I was so relieved to find out I have bipolar disorder. When that diagnosis left my psychiatrist's mouth, I was filled with a sense of calmness. Finally, I had an answer to the rampant nightmare that I had been living for many, many years. Depressions so severe that at times I was unable to speak, let alone move my body (not even to walk to the toilet), led me to active suicidal ideation and substance abuse to avoid confronting the darkness in my mind. The depressions alternated with the 'ups', the hypo/mania state of being unable to talk fast enough to keep up with the spew of words in my mind, finding *everything* rapid-fire hilarious, believing I am God's gift to humanity, expressing a level of creativity that even the greatest creative minds can't keep up with, the never-ending energy and lack of sleep, and the appearance of having the best time of my life (although, deep down, hypo/mania feels awful). Living between these two





states (and severe anxiety experienced on the ways 'up' and back 'down') is a ride on the bipolar rollercoaster; one ride that I can't get off. The bipolar rollercoaster can be slowed down and mellowed out with all the help and hard work that comes with (and after) a diagnosis.

I liken my pre-diagnosis bipolar experience as being trapped in a dark, scary maze filled with terrifying things happening with no explanation and monsters chasing after me. The maze is my brain. Then one day my psychiatrist handed me a map of the maze and explained away the scariness of the creatures, how to find my way through the least dangerous routes of the maze and into the daylight where the terrifying monsters don't appear as frightening anymore. I was no longer alone in battling a beast I didn't understand.

The day of my diagnosis was the first day of the maze map guiding me to respite in my life. It was the first day of a long, long, long journey to correctly medicate and treat my bipolar – a journey that is never-ending. A correct diagnosis gave answers to questions I didn't know how to ask but was living with the consequences of. I've had to learn to be deeply aware of myself, my actions and my thoughts so that I don't actively or accidentally trigger a depressive or hypo/manic episode. It has brought me great self-awareness and control but also a fear of letting go of this strict control I keep myself under.

When I told people that I had been diagnosed with bipolar, I was met with so much pity and disappointment, which confused me because I was sharing it as joyful news. Suffering from the symptoms didn't start with the diagnosis, which is what the pitiers seemed to think; in fact, the diagnosis brought with it a sense of hope that things can get better.



Take a moment to see whether you identify with any of the common conditions associated with neurodivergence below. Note that this list is not exhaustive but covers conditions that may occur during young adulthood and which may be worsened by the university context. If you feel that one or more of these descriptions fits you, it's best to get it confirmed by a qualified professional, such as the Disability Unit's educational psychologist or a psychiatric nurse at Student Wellness Services. If that feels too big a step, maybe start by talking to someone who knows you well.

Attention deficit (hyperactivity) disorder (ADD/ADHD): Difficulties with attention, daily functioning, organisation, impulsivity and executive function.

Auditory processing disorder (APD): Difficulties with making sense of sounds. May forget instructions, misunderstand what's said, be slow to respond or tune out during conversations.

Autism/Autistic spectrum disorder (ASD): Differences in social communication, cognition and behaviour. May exhibit social anxiety, repetitive behaviours and a strong need for routine. May have difficulties with sensory processing and executive function.

Bipolar mood disorder: Alternates between intense emotional states (manic episodes marked by increased impulsivity, creativity and activity with racing thoughts and lack of sleep) and depressed episodes (with overwhelming feelings of sadness and negativity, increased irritability, sensitivity to noise/lights/smell/touch, changes in appetite and lack of focus).



Major depressive disorder (MDD): Lack of energy, chronic feelings of sadness or hopelessness, negative thoughts and loss of interest or pleasure in activities and relationships. May have difficulty concentrating, changes in appetite and sleep, increased irritability, feelings of worthlessness or thoughts of harming themselves or others.

Dyscalculia: Difficulties with arithmetical skills and number concepts. May have difficulty describing the sequence of events, following directions or using spreadsheets.

Dysgraphia: Difficulties with writing and fine motor skills (like writing, cutting food, doing puzzles or manipulating small objects by hand). Can have difficulty reading maps and drawing.

Dyslexia: Difficulties with reading, spelling writing and distinguishing left from right. May find it hard to listen or maintain focus. Finds it difficult to organise thoughts and follow several instructions at once.

Dyspraxia: Difficulties with motor skills, balance, hand-eye coordination, spatial awareness and keeping track of time. Over- or under-sensitive to smell, taste, light, food textures, temperature and pain.

Language processing disorders: May have difficulty with understanding social cues, problem-solving, organisation, comprehension and communication. Difficulty with skills which are not verbal, such as social, visual-spatial and fine motor skills.



Schizophrenia: Changes in the way reality is perceived leading to persistent delusions or hallucinations, jumbled speech and disorganised behaviour.

Sensory processing disorder: Feels overwhelmed by environmental stimuli, such as loud music, ticking clocks, bright light and perfume. May feel exhausted when engaging with the outside world or cut off from it.

Visual processing disorders: Difficulty making sense of visual information. May confuse similar looking words. Difficulty with reading comprehension, telling time, following complex instructions and legible handwriting.

STRATEGIES AND SAFETY NETS

Understanding your neurotype can help you develop strategies for optimal functioning and find appropriate help, or 'accommodations', which can make life more manageable. It can, however, be difficult to know what accommodations are available, and which are relevant to you. To get you started, Figure 2 summarises some accommodations that are often useful for neurodivergent students. The [Disability Unit](#) and [Student Wellness Services](#) can also help you to find accommodations that work best for you.

Figure 2: Types of neurodivergence and possible accommodations

ADHD/ADD	APD	ASD	Bipolar disorder	MDD	Dyscalculia	Dysgraphia	Dyslexia	Dyspraxia	Language processing disorders	Schizophrenia	Sensory processing disorders	Visual processing disorders	
													Academic counselling
													Academic leave of absence
													Adaptive lab equipment
													Assistive listening devices
													Audiobooks, text-to-speech software
													Clear instructions, written rubrics
													Different or reduced course load
													Faculty or peer mentor
													Hard copies of lecture notes
													Scribe and/or reader for assessments
													Seat at front of class
													Separate residence room
													Separate venues for assessments
													Software for time management

Even if you identify accommodations that could benefit you, you might still be apprehensive about seeking help. Some students feel they aren't struggling enough to ask for help. Some find it too overwhelming to engage with the university itself. Some students feel ashamed that they aren't coping and try to fix their problems by themselves. It is important to know that denying yourself accommodations is like throwing your reading glasses away and telling yourself to 'try harder' to see. Accommodations are not things you can simply 'try' yourself out of needing. The fact that you might benefit from an accommodation also doesn't reflect a lack of hard work or intelligence on your part.



In addition to the accommodations listed above, there are other strategies that can help neurodivergent people to stay afloat. A tricky thing about neurodivergence is that many of the strategies that help most people to combat burnout are the same things that neurodivergent people find the most difficult. Every doctor will tell you that the keys to good mental and physical health are sleep, a balanced diet, regular exercise and a good social support system. Yet, neurodivergent people often battle with sleep disorders, executive dysfunction, sensory overload and social anxiety – making most of these things very complicated.

In a country where awareness about neurodiversity is poor, many neurodivergent people resort to unhealthy mechanisms to cope. This is entirely understandable – when neurodivergent people aren't given the resources they need, they have to find their own ways to survive. So, nobody should feel bad about doing the best they could with the options they had. The problem is that, down the road, unhealthy coping mechanisms have a way of turning into extra problems rather than helping you to solve the ones you started with.

That's why it can help to build routines and habits that serve as 'safety nets' in times of stress. These safety nets are things that protect your physical and mental health, ward off burnout and reduce your risk of secondary psychopathologies. Building these safety nets can be difficult, as it takes time to figure out what strategies work for you, and they will differ from person to person. It is also worth pointing out that the strategies available to each of us depends on the resources we have access to. Still, there are a few common guidelines that might give you a useful starting point.

I have this meaning-making map that orients me into reality, and it's all interlocked and connected and dependent on itself. When one piece doesn't fit, the whole thing falls apart.



At university, it is common to see students manage to pull all-nighters, eat nothing but a noodle cup once a day or drink every weekend – and feel perfectly fine. However, sleep and diet are more complicated if you struggle with executive dysfunction, anxiety or depression. Because sleep-related disorders are so common among neurodivergent people, many of them need more sleep than others to function optimally. It can help to establish a consistent sleep routine and practice good sleep hygiene. You can also experiment with white noise, noise-cancelling earphones or eye masks to eliminate distracting stimuli.

Here, consistency is more important than perfection. If you only manage 4–5 hours of sleep, try to keep to the same 4–5 hours every night. Even when you can't sleep at all, it is still helpful to lie down in the dark for a couple of hours, maybe listening to calm music, rain sounds or a favourite podcast. If you are unable to sleep for weeks at a time, it is time to seek medical advice – people with anxiety, ADHD or depression may require medication to alleviate insomnia. Otherwise, just teaching your body to expect rest every night, keeping it calm and giving it the opportunity to sleep helps to avoid the self-perpetuating cycle of sleep deprivation and anxiety that causes so much distress.

Consistency is also a good rule of thumb when it comes to nutrition. Your brain chemistry is highly sensitive to your nutritional state, so establishing a routine of consistent energy intake really helps those who are prone to anxiety, depression or emotional dysregulation. Like everyone, most neurodivergent people will benefit from a balanced diet (think low GI carbohydrates, healthy fats, protein and fruits or vegetables every day).



However, if you struggle with balance or variety, it can still make a huge difference to just aim for regular, adequate meals during the day – whatever that looks like for you. Many neurodivergent people find that there are certain safe foods that they find it easier to tolerate when they are distressed. If possible, it is a good idea to have an emergency stash of safe food at home or in your backpack for days that are particularly difficult.

Because of differences in neurochemistry, neurodivergent brains can also be more prone to addiction – which makes drugs and alcohol use more complex. Sometimes, it can help just to be aware that certain things might affect your brain differently, so you need to make different decisions to keep yourself safe. What is healthy for you might look different to what healthy means for others, and this can be true for a lot of things (like social media, sugar, caffeine or exercise).

Many neurodivergent people find that social media can be an incredible tool to access information and an online community where experiences can be shared. However, social media triggers the same neural circuits that can be hijacked by addictive substances, so it isn't always easy to use in moderation. It also provides us with constant exposure to oppression and violence on a global scale, which is something human brains just weren't built to handle. This kind of exposure can simply overwhelm your emotional and cognitive capacity, leading to depression, apathy or hopelessness.

This doesn't mean that the solution is to look away from the suffering of other people, but working towards systemic change is a marathon, not a sprint, and we are going to need to take pit stops to catch our breath



along the way. In the long run, you are going to need to look after your health in order to meaningfully change the world around you, so keep an eye on how social media is affecting your capacity to function and take breaks from time to time to let your brain chemistry reset.

Building a safety net isn't easy and it doesn't happen all at once. It is normal for things to go out the window every so often, but it will get easier with time. Just remember to be patient with yourself and take care of your physical, emotional, and social needs as best as you can along the way.

FROM THE DESERT TO THE DEGREE

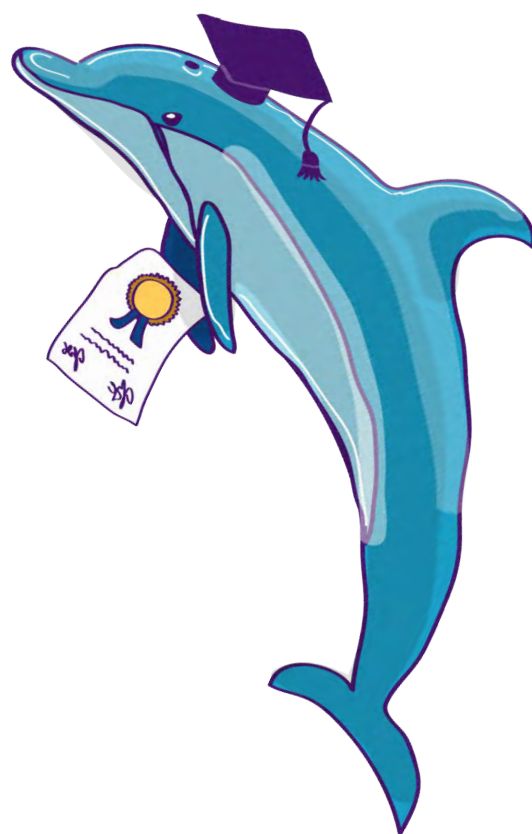
Understanding neurodiversity is the first step towards a world that is more accessible for every brain. And **everyone** benefits when neurodiversity is accepted, accommodated and valued. Although we still have a long way to go, the world we live in now at least better understands neurodiversity. Workplaces and universities are slowly becoming more accessible, and some companies have started to recruit neurodivergent employees for their unique strengths. This is especially true in science, where we need flexible approaches to problem solving, unique perspectives, and collaboration between people with different skill sets in order to make meaningful progress.

If you have a neurotypical brain, understanding neurodiversity empowers you to facilitate positive societal change in both academic and personal spaces. It provides you with the knowledge and tools



to work effectively with neurodivergent colleagues, respect the challenges they face, support them where possible and maximise their talents. If you one day become a successful scientist or professor, you will be able to support your neurodivergent students, helping them to reach their full potential and contribute towards better science.

If you have a neurodivergent brain, understanding your neurotype can help you to re-evaluate your strengths and challenges in a whole new light. Maybe, being at university will help you find a sense of belonging, purpose and community, and lead you to discover new strengths you never knew you had! If university feels overwhelming, confusing or lonely at times, remember that it's not a sign that you have failed or let anyone down. And it's certainly not because you are a bad person or a terrible student. It might just be that you are a dolphin in the desert. So please don't spend the next few years trying your hardest to become a camel. The world out there has many oceans waiting for a dolphin like you. And by the end of this, you will be a dolphin... with a degree.





READ/WATCH MORE

The Office for Inclusivity and Change (OIC) has put together a great introduction to some useful resources in their first edition of the **Disability Matters** magazine.



Accessing accommodations

In order for you to qualify for accommodations, you must:

- Register with UCT's **Disability Service**.
- Undergo an assessment by a professional.
 - For learning difficulties, you will need to see an educational psychologist (who you can access through the OIC).
 - For psychiatric conditions, you will need to see either a psychiatrist, clinical psychologist or occupational therapist (the OIC can assist you with this).

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