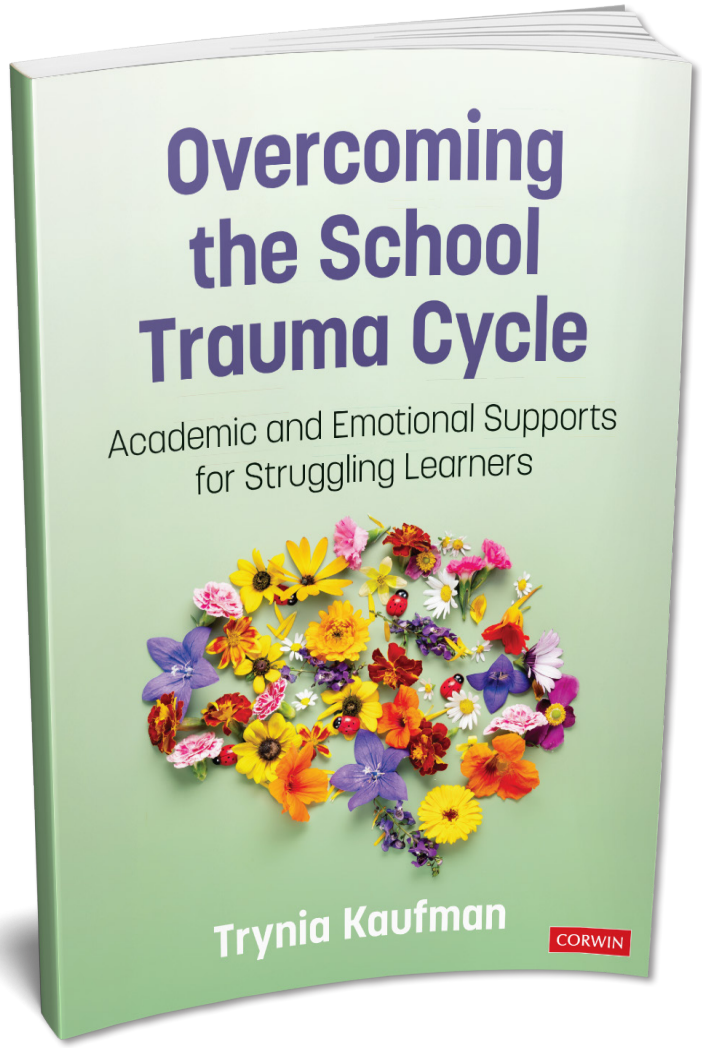

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CHAPTER 3

EMOTIONS, MENTAL HEALTH, AND LEARNING

There will be no progress in education without simultaneously considering the emotional and cognitive facets of our brain… both are considered key ingredients of the learning cocktail.

~Stanislas Dehaene, cognitive neuroscientist

Attending to students' social-emotional needs is sometimes mistakenly seen as oppositional to rigor or high expectations when, in fact, we cannot achieve high standards for all students without creating a supportive and welcoming learning environment. As one of my mentors, Emily J. Jones, Deputy Director at the Center on Culture, Race, & Equity at Bank Street College of Education, says, "Relationships *are* rigor." Building positive relationships and helping students feel like they belong increases academic engagement and achievement, with the added benefit of also reducing behavioral issues (Rimm-Kaufman et al., 2010; Saft & Pianta, 2001).

Educators often fall into one camp or the other as if in a zero-sum game where they must choose one or the other – either the learning standards or students' social-emotional needs. Some educators tiptoe into therapist territory. They may spend entire class periods talking to students about their feelings or things going on in their lives, scarcely touching the learning standards. Other teachers kick students out of class at the drop of a pencil rather than allow any space in class for developing social or emotional skills. Neither is an effective way to achieve high standards (or truly, even minimal standards). While some students can be successful in any class with nearly any teacher, too many are left behind when we don't find a balance of attending to their social-emotional needs as well as their academic development. Understanding

how emotions impact students can help us accelerate learning and improve behavior. It also helps us avoid or overcome the school trauma cycle where some students get stuck in a never-ending loop of academic and mental health challenges which we'll discuss in more depth in Chapter 4.

EMOTIONS AS THE GAS PEDAL

Emotions are the gas pedal of learning – at times, accelerating learning like a teenager with a new car, and, other times, slowing learning to a complete standstill like we're stuck in the mud. The analogy of the gas pedal is quite literal, too. Just like a gas pedal controls the amount of fuel going into the engine, the way we feel can literally redirect the brain's fuel sources, increasing or decreasing our capacity for learning. When we're feeling optimistic and energized, even challenging tasks tend to be more manageable. Conversely, when COVID-19 surged across the country and the world in 2020, many of us found it harder to complete any activity that required concerted effort or sustained attention. Sometimes even routine tasks felt overwhelming. We may also have found ourselves obsessively watching or reading news related to COVID-19. This happened because the brain detected a threat (a pandemic) and redirected our attention toward that threat with the goal of keeping us safe. This is one of the primary jobs emotions perform – keeping us safe, both physically and psychologically.

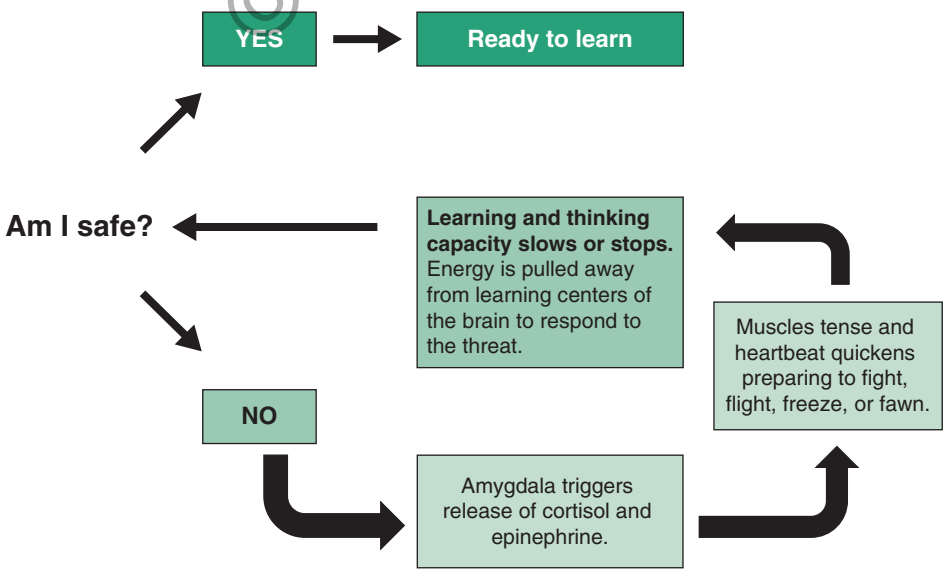
> ***Negative emotions crush our brain's learning potential, whereas providing the brain with a fear-free environment may reopen the gates of neuronal plasticity.***
> **~Stanislas Dehaene, cognitive neuroscientist**

The **amygdala** is the key region of the brain responsible for processing our emotions and directing our energy and attention to where it's needed to keep us safe. Is something scary happening? Do other people like me? Did someone threaten my safety? Am I injured? It is constantly processing what is happening in the environment (through our senses) and internally in the body (our visceral state of being) and then preparing the body to respond. When a threat is detected, the amygdala triggers the release of **epinephrine** (adrenaline) and the stress hormone **cortisol**. The more dangerous the threat seems to be, the more of these hormones will be released. Adrenaline increases our heart rate and muscular tension, preparing us for the well-known fight, flight, freeze, or fawn response (fawn refers to when a person tries to pacify a threat such as by agreeing with or giving in to someone's demands). We might feel this in our body before we even consciously comprehend what is happening. If you've ever had a close call while driving, you likely experienced an immediate rush of adrenaline, a quickening of your heart, and tension in your muscles. This prepared your body to respond quickly, likely before you even were consciously aware of the danger. Now imagine that someone asked you to solve a math equation or give a presentation while you were in that state. It would be impossible.

To keep us safe in a dangerous situation, the amygdala redirects energy resources in the brain and body to focus solely on the threat (like an impending car wreck). This means that energy is pulled away from the regions of the brain responsible for higher ordered thinking and learning. Going back to our fuel analogy, it's like when you pull your foot completely off the gas pedal. This is known as the **amygdala hijack** (see Figure 3.1). The thinking and learning centers of the brain are no longer getting the fuel they need to operate and will slow down or stop working altogether. Meanwhile, the parts of the brain focused mainly on survival – commonly referred to as the reptilian brain – takes over.

Granted, apart from the amygdala hijack, we usually have some control over our emotions. The **prefrontal cortex** (PFC) of the brain helps with this skill. It sifts through all the various demands being placed on us, including our emotions, and decides what to prioritize and what to suppress. It's often referred to as the executive control center. Just like the executive of a company, the PFC is responsible for helping us make responsible decisions and plan for the future. For example, when the amygdala sends a message of anxiety before a science test, the PFC will compare that message to all the other messages it receives from other regions of the brain including the **hippocampus**, the brain's memory center. How have we done on science tests previously? Did we study? The PFC then decides what action to take. If it determines the science test is important to us and we're capable of doing well (based on prior performance), it may motivate us to study before the test to make sure we do well and reduce our anxiety. Conversely, if we haven't done well on prior tests, the PFC may decide that studying is not worth our while. The PFC is one of the last brain regions to fully develop, reaching full

FIGURE 3.1 THE AMYGDALA HIJACK



maturation around age 25. This means that all our students – even our high schoolers – are still developing the capacity to manage their emotions, think about long-term consequences, and make responsible decisions.

Thankfully, emotions aren't always negative. Our emotions can also pump us up and accelerate learning. From the moment we're born, we find it immensely enjoyable to learn something new. **Dopamine** is a well-studied chemical in the brain that drives us to pursue rewarding activities – like learning to crawl as a baby. The baby might be motivated by wanting to get a toy that is just out of reach or perhaps a caregiver is a few feet away offering encouragement. When the baby successfully grabs the toy or reaches the person, pleasurable feelings spread from the brain into the rest of the body. They're more likely to want to attain that same feeling in the future, leading them to attempt the activity again and again, which leads to more and more skill in crawling. Success is addictive to the brain. The more success we have, the more we want.

Think of dopamine as a friend who follows you around writing in-the-moment reviews of everything you do or experience. Five stars for must-do, highly rewarding experiences. One star for the avoid-at-all-costs experiences. Without dopamine, Pavlov's dog couldn't have made the association that a ringing bell meant food was about to be served. Dopamine, simply speaking, triggers these associations in the limbic system of the brain, including the amygdala and hippocampus, which motivate us to seek out the rewarding experience again and again (Wise, 2004). When a student performs a task and is rewarded (through positive feedback or attaining something they want), dopamine is released, and the brain encodes the memory of the rewarding experience which motivates the student to perform the task again. This **positive cycle of learning** helps them become better and better at that skill (see Figure 3.2).

FIGURE 3.2 THE POSITIVE CYCLE OF LEARNING

Source: Adapted from "The optimum context for learning; Drawing on neuroscience to inform best practice in the classroom" by Hohnen, B., & Murphy, T., 2016. *Educational and Child Psychology*. 33. 75–90.

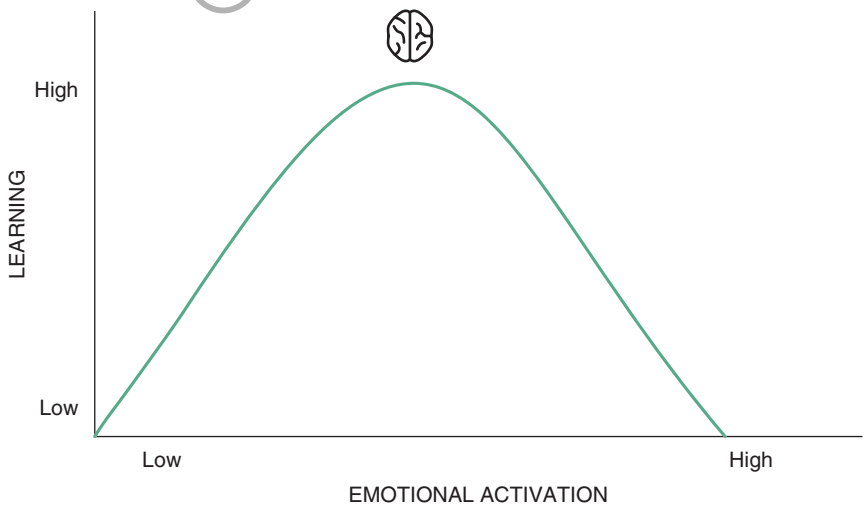
EMOTIONS AS CLUES

Like thirst or hunger, emotions provide clues to what is needed in any given moment. For example, when students seem bored or lethargic, we might decide to get them up and moving for an activity or help them see how the lesson is relevant to their lives and interests. On the flip side, if we see that students are hyper or restless, it's a clue that something in their environment or in their body is throwing them out of balance. We're always striving for the ever-elusive, Goldilocks-perfect level of emotional activation. As pictured in Figure 3.3, when students have very low levels of emotional activation (e.g., tired or bored), they are less likely to be engaged and learning. When they have very high levels of activation (e.g., highly anxious, upset, or hyper), they are likely too amped up to learn.

> ***Emotions are states of readiness that arise in our brain in response to our surroundings. They give us critical feedback about the world and set the stage for actions and decisions.***
>
> **~Eric Kandel, neuroscientist and Nobel Laureate**

We certainly won't always know how students are truly feeling. Our students, themselves, might not even know how they're feeling or why they're feeling that way. We often have to watch students' body language and behaviors for clues. Interestingly, research has shown that emotions appear in the body first, as physical sensations and behaviors, before we even become aware of them (Kandel, 2018). Think of how your palms become

FIGURE 3.3 ACTIVATION LEVELS AND LEARNING



Source: Adapted from "Engage the brain: How to design for learning that taps into the power of emotion" by Posey, A., 2018. ASCD.

sweaty when you're nervous, how your face flushes when you're embarrassed, or your jaw clenches when angry. Some people find it easy to identify their emotions, but for others, learning to notice these physical manifestations of emotions can help.

Physical sensations in the body give us clues about our emotional state, and our emotional state gives us clues about how to respond or what we need in any given situation. Our emotions aren't always "right" about what we need, of course. Sometimes they can lead us astray. For example, depression can cause intense sadness for seemingly no reason. Even if we are not struggling with our mental health, we can misinterpret a situation and feel emotions that aren't going to lead to a helpful response. Our emotions give us clues, but our logical brain can help us analyze the situation to see if our emotions are leading us to a solution or a dead-end. Whether emotions seem logical or not, they're still very real and should be treated as such. Young people's emotions, especially, may sometimes seem completely illogical or blown out of proportion to an adult. However, telling a child that they're being unreasonable or crying for no reason isn't helpful. Young people need adults to help them identify and cope with their emotions while their brains are still developing that capacity.

Our emotions give us clues, but our logical brain can help us analyze the situation to see if our emotions are leading us to a solution or a dead-end.

The first step is observing students' behaviors, which gives us clues as to their emotional and physical state. Then, we can dig a little further to figure out what is driving the emotions and behaviors and how we can help them find a more balanced state. Is the student feeling overwhelmed or confused by the lesson? Did they miss recess or gym class and not have a chance to expend their energy? Did they just come back from lunch and need some time for their body to calm down? Conversely, have they not had lunch and are hungry? Physical needs – like hunger, thirst, and movement – are tightly intertwined with emotions and resulting behaviors as well. Anyone who's ever been hangry (a slang term for becoming irritable when hungry) or has put up with a loved one being hangry understands this well!

EMOTIONS AS A GUIDE

Knowledge doesn't count for much if students aren't able to apply it in real-life contexts. Some surprising brain research over the past several decades has shown just how essential social-emotional skills are in this regard. In *We Feel, Therefore We Learn* (2007), renowned neuroscientists Mary Helen Immordino-Yang and Antonio Damasio recount research studies (led by

Demasio) which found that certain brain injuries could affect decision-making ability even when intelligence remained intact. The researchers studied patients who had suffered brain injuries impacting specific areas of the prefrontal cortex. As Immordino-Yang and Demasio explain, prior to the brain injury "these patients had been upstanding, reliable, and foresightful citizens" and after, "they would not perform adequately in their jobs, in spite of having the required skills; they would make poor business deals in spite of knowing the risks involved; they would lose their savings and choose the wrong partners in all sorts of relationships" (2016). Surprisingly, the patients still performed well on intelligence tests after their injury. So why weren't they able to make advantageous decisions? The researchers found that the brain damage caused challenges with using social-emotional knowledge to make the right decision. The patients also were unable to learn from mistakes through social feedback (through feeling compassion, embarrassment, guilt, etc.).

> ***When educators fail to appreciate the importance of students' emotions, they fail to appreciate a critical force in students' learning. One could argue, in fact, that they fail to appreciate the very reason that students learn at all.***
>
> **~Mary Helen Immordino-Yang, neuroscientist and educational psychologist**

Remember, emotions are clues that help us decide how to act or behave in a given situation. When we feel embarrassed after making a mistake, we likely will apologize and try to avoid doing that in the future if we want to stay in people's good graces. The feeling of embarrassment can motivate us to make decisions that have more positive outcomes. As you can imagine, an inability to effectively process our emotions can cause extreme challenges with social relationships. Further, as the researchers saw in the brain-damaged patients, it also interferes with one's ability to effectively use logical reasoning and problem-solving in general since arguably all decisions are made in a social-emotional context.

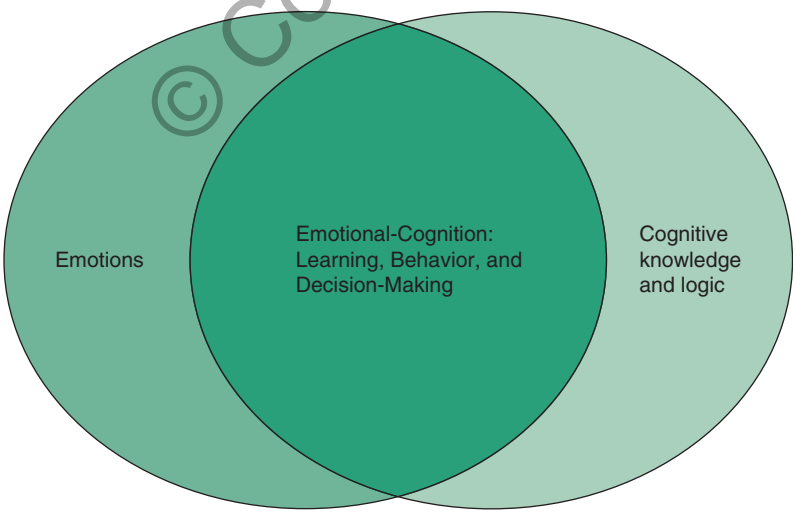
The most famous and particularly severe example of this type of brain injury is demonstrated by the case of Phineas Gage. In 1861, Gage suffered brain damage after a construction accident in which an iron rod went all the way through his head, including the region of the brain now known as the **prefrontal cortex** (**PFC**). Amazingly, he survived. Gage's intelligence seemed intact, but people who knew him said he was a different person after the accident. Gage reportedly struggled with social conventions and emotional regulation. He was prone to excessive profanity, mood swings, stubbornness, and irresponsibility. He had the same knowledge and problem-solving capacities as before but was unable to apply them due to his social-emotional deficits. His employer fired him, and he struggled to hold down a job afterward.

These studies show just how important social-emotional skills are in applying logic and knowledge in real life contexts. As discussed, Gage and patients with similar brain injuries experienced flawed reasoning because they were unable to use emotional and social inputs to guide their decision-making, despite having maintained normal intelligence. The damaged brain region, called the **ventromedial prefrontal cortex** (**vmPFC**), is responsible for higher ordered processing of emotions and social feedback that guides decision-making. Essentially, the vmPFC links knowledge with emotion in order to make appropriate decisions in different situations. Arguably every decision we make involves social-emotional considerations for ourselves and those around us (Figure 3.4).

These studies show just how important social-emotional skills are in applying logic and knowledge in real life contexts.

Although students are unlikely to have suffered a brain injury like that of Phineas Gage or Demasio's patients, this research highlights the importance of supporting the development of students' social-emotional intelligence alongside academic knowledge and reasoning. Remember, too, that the PFC which enables emotional processing is still developing in students and that some students with disabilities experience delayed development of the PFC.

FIGURE 3.4 THE ROLE OF EMOTIONS AND COGNITION IN DECISION-MAKING



Source: Adapted from "Emotions, learning, and the brain: Exploring the educational implications of affective neuroscience" by Immordino-Yang, 2016, W. W. Norton & Company.
Note: All learning, behavior, and decision-making rely on our cognition (knowledge and logic) as well as emotions. Our emotions give us clues about how to best use our knowledge to make decisions in any social context. When we learn something new or see the impact of our behavior, the brain tracks what we've learned – both cognitively and emotionally. Our emotions are also informed by our knowledge and vice versa.

Let's walk through an example. When you're teaching a lesson, your brain is busy behind the scenes sifting through all the information you'll need to teach that lesson and helping you make decisions in the moment. At the forefront of your mind might be the actual cognitive knowledge you're trying to impart – whether that's the quadratic equation, the structure of a sonnet, or the organisms of an ecosystem. At the same time, your brain is also calculating the impact your words are having on each of your students. You're noticing their body language and evaluating what they say to determine whether they're engaged and understanding the lesson. Depending on your familiarity with the subject matter and your relationships with the students, you may be self-conscious about how you're coming across and what your students think of you. You may also be subconsciously thinking about the impact this lesson could have on you professionally; for example, if you think the principal might come by to observe the lesson or if you think parents might complain about the lesson. All these social-emotional considerations are being evaluated by the vmPFC, in conjunction with your knowledge, priorities, and prior experiences, in order to steer your decision-making while you're teaching.

All this to say, your knowledge of the subject matter is certainly not the only skill you need to have as a teacher. You also need social-emotional awareness to evaluate how you are impacting your students in the moment. You have to decipher students' body language and understand their point of view. These social-emotional skills lay the foundation for applying your subject matter knowledge in a real-life setting. The same holds true for your students while they're in school as well as in whatever career they pursue in the future.

Most of us likely underestimate the importance of emotions in guiding decision-making. Every lesson we teach is impacted by the social-emotional context of that class. Further, everything students learn will be implemented in a social-emotional context. Of course, some situations and topics will be more emotionally charged than others, but even in situations that seem more objective, social-emotional factors will still influence the decision-making process. As teachers, attending to the interaction between emotions and cognition allows us to attend to the context in which learning takes place as well as how students will use the knowledge in the future. As Immordino-Yang and Demasio aptly describe: "emotions are not just messy toddlers in a china shop, running around breaking and obscuring delicate cognitive glassware. Instead, they are more like the shelves underlying the glassware; without them cognition has less support." No matter how much knowledge we impart to our students, if they lack social-emotional skills, they will struggle to apply what they've learned in real-life contexts.

Additionally, and perhaps most importantly, humans are innately social creatures. Relationships and connections are essential to our well-being. So while it's true that building social-emotional skills will help our students in their future careers and endeavors, it should also be enough of an argument that our students need these skills to help them build relationships, cope with emotional challenges, and live fulfilled lives.

Putting it all together, our emotions can heighten or hijack our learning capacity (like a gas pedal), provide clues as to what we might need or what action we need to take in any given situation, and harness what we've learned to apply it.

MENTAL HEALTH DISORDERS AND LEARNING

In 2021, the American Academy of Pediatrics, American Academy of Child and Adolescent Psychiatry, and Children's Hospital Association declared a national emergency in child and adolescent mental health. This was partly in response to the skyrocketing rates of mental distress during the COVID-19 pandemic, but mental health disorders had already been significantly rising (Lebrun-Harris et al., 2022). According to the CDC Adolescent Behaviors and Experiences Survey in 2021, over a third of high schoolers reported experiencing poor mental health during the pandemic.

Unfortunately, many adolescents experiencing mental health challenges do not receive a diagnosis or treatment. Reasons for this include the ongoing stigma around receiving treatment for mental health, the lack of availability of psychologists and psychiatrists, and the costs of receiving treatment. These barriers to treatment are even higher for students living in low-income or rural communities. Additionally, many adolescents may experience mental health challenges that don't rise to the level of a diagnosis.

Most people struggle with difficult emotional challenges at one point or another, like the death of a loved one or a serious injury or illness. We may feel sad, angry, or overwhelmed, but usually we eventually acclimate to our new normal, and our intense feelings subside enough for us to move forward. This may lead us to underestimate the impact of mental health disorders since we tend to think everyone experiences the ebb and flow of emotions the same way we do. Remember from Chapter 1, though, our genes set the stage for how our brain functions and cause each of us to have a brain that functions at least somewhat differently from the person next to us. Like most things, mental health disorders are the result of a complex interplay between our genetics and our environment. Sometimes a traumatic event may trigger a mental health disorder, but other times they seem to develop spontaneously.

So how do we know if it's a mental health disorder or just a rough patch? There are specific criteria that mental health professionals use to diagnose each disorder. If emotional challenges are ongoing and severe enough to limit one's ability to function in their daily life, a mental health professional should be consulted. It's essential that the adults in children and adolescents' lives help them navigate their emotional challenges and seek an evaluation and treatment when needed. If a student's mental health challenges significantly impair their ability to learn in school, they should be evaluated and provided with special education services just like any other disability that impacts learning.

While teachers shouldn't take on the role of therapist or social worker, learning about mental health challenges and how they impact learning and behavior can be helpful. Keep in mind that many mental health disorders have overlapping symptoms and often co-occur. For example, up to 75% of young people with depression also have anxiety (Centers for Disease Control and Prevention, 2022b). Similarly, those who have experienced trauma are more likely to develop depression, anxiety, or another mental health disorder. This section provides an overview of some of the most common mental health challenges teachers encounter in their classes: depression, anxiety, and trauma/toxic stress. It is by no means an in-depth analysis nor an all-inclusive list but is meant to be a starting point. In Chapter 4, we'll look at what the research tells us about how commonly these mental health challenges co-occur with learning challenges.

While teachers shouldn't take on the role of therapist or social worker, learning about mental health challenges and how they impact learning and behavior can be helpful.

Depression

Although depression can sometimes occur in younger children, it tends to develop after puberty, with rates rising in the adolescent years. Nearly one third of high schoolers experienced persistent symptoms of depression in 2019, a 40% increase from 2009 (CDC, 2021). During the pandemic, the percentage rose even further to nearly half of high schoolers feeling persistently sad or hopeless (CDC, 2022a). Teen girls and students who identified themselves as Lesbian, Gay, Bisexual, or Queer/Questioning (note, the survey did not ask students if they were transgender) experienced the highest levels of mental distress. Both groups were nearly twice as likely to report symptoms of depression or to have seriously considered suicide compared to male students or non-LGBQ students. Female and LGBQ students also reported the highest levels of sexual violence and rape which certainly contributes to mental distress. According to the data, 14% of teen girls and 20% of LGBQ students reported having been raped.

Adolescence is a time of big developmental changes which have the potential to cause more intense emotional swings. This can make it hard for adults to know if the adolescent is experiencing the typical teenage rollercoaster of emotions or if something more serious is going on. If a child or adolescent is feeling sad for weeks on end or for no apparent reason, or if they are acting in ways that are dangerous or self-injurious, a mental health professional should be consulted. However, even if their sadness or irritability doesn't meet the criteria for depression, their feelings should still be taken seriously. Suicide is a real concern as it's the second leading cause of death of 10–14 year olds and third for older adolescents (tragically, homicide is second). Accidents or unintentional injuries are the leading cause for both groups.

Researchers have found that depression is associated with lower academic grades and reduced school attendance (Duncan et al., 2021). This may be because depression can negatively impact concentration, memory, and motivation. Using brain imaging techniques, neuroscientists found that people with depression have atypical brain activity in several areas of the brain, including the **amygdala**, the brain's emotion processor, **hippocampus**, the memory center, **PFC**, executive control center, and **nucleus accumbens**, which directs responses to aversive and rewarding stimuli in the environment (Russo & Nestler, 2013).

Signs of depression in adolescents according to the Centers for Disease Control and Prevention (CDC, 2023) include:

- Feeling sad, hopeless, or irritable a lot of the time;
- Not wanting to do or enjoy doing fun things;
- Showing changes in eating patterns – eating a lot more or a lot less than usual;
- Showing changes in sleep patterns – sleeping a lot more or a lot less than normal;
- Showing changes in energy – being tired and sluggish or tense and restless a lot of the time;
- Having a hard time paying attention;
- Feeling worthless, useless, or guilty; and
- Showing self-injury and self-destructive behavior.

Anxiety

Anxiety is more than twice as common as depression in adolescents, and rates of diagnosis in children and adolescents increased by 27% between 2016 and 2019 (Lebrun-Harris et al., 2022). According to the CDC (2022b), nearly 10% of children aged 3–17 have been diagnosed with anxiety. The COVID-19 pandemic understandably heightened levels of anxiety. A meta-analysis found that approximately 1 in 5 youth across the world experienced heightened levels of anxiety during the pandemic (Racine et al., 2021).

Anxiety is more than just nervousness. We all have felt nervous or afraid at one time or another: perhaps before teaching our first class or seeing a spider sneak across our bedroom floor. In these situations, the brain is using "nervousness" to motivate us to prepare and focus on the task at hand and to escape perceived threats. Some anxiety is to be expected and is actually helpful! Anxiety becomes "disordered" when it is intense, chronic, and exceeds the point of being helpful.

Remember, when an extreme threat is detected, the amygdala can trigger fight, flight, freeze, or fawn and hijack the brain's ability to learn. With an anxiety disorder, the amygdala is triggering this response even when there isn't a significant threat. A student might experience extreme anxiety when asked to read aloud, when taking a test, or even for no apparent reason at all. Let's take a closer look at an example of how this level of anxiety can impact learning. While some nervousness before a test can be motivating (to get us to study and to help us focus and not get distracted while taking the test), a student with test anxiety experiences so much anxiety that they find it nearly impossible to remember anything they've learned. It can be difficult to figure out what is driving a student's anxiety and whether it's actually an anxiety disorder. Does the student just need more support with test-taking skills or studying strategies? Does the student have an untreated learning disability that's contributing to the test-taking anxiety? Did something happen that's heightening their anxiety? Teachers and parents can help think through the different possibilities, but a mental health professional has training that helps them uncover what is driving the student's challenges.

Signs of anxiety in adolescents according to the Child Mind Institute (Miller, 2022) include:

- Recurring fears and worries about routine parts of everyday life;
- Irritability;
- Trouble concentrating;
- Extreme self-consciousness or sensitivity to criticism;
- Withdrawal from social activity;
- Avoidance of difficult or new situations;
- Chronic complaints about stomachaches or headaches;
- Drop in grades or school refusal;
- Repeated reassurance-seeking;
- Sleep problems; and
- Substance use.

Trauma and Toxic Stress

If we're under a constant state of stress or we experience a traumatic event, it may exceed our capacity to cope and tip us into a trauma response. Essentially, our fight, flight, freeze, or fawn mode gets stuck in the ON position.

Remember the amygdala hijack – when a student is in a traumatized state, learning cannot happen, or will at best, be very challenging and slow.

What types of events cause trauma? It's different for everyone, but any event that causes extreme or ongoing physical or emotional harm has the potential to cause trauma. Common traumatic experiences include witnessing or experiencing violence or abuse (physical, emotional, or sexual), serious car wrecks or injuries, family separation, serious medical issues, etc. However, experiencing a traumatic event does not always mean a child will be traumatized. Different children will have different reactions even to the same event. Their varying reactions depend on a mix of genetics, past experiences, and what psychologists and researchers call **protective factors**. One of the most salient protective factors is having a positive, nurturing relationship with an adult who can provide support after a traumatic event. Past experiences are also important because they create the framework through which the child's body and brain responds to the world. Trauma tends to compound – the more traumatic experiences a child has had, the more likely they are to experience a more severe response.

Signs of trauma according to The National Child Traumatic Stress Network (2008) include:

- Worried or anxious about safety;
- Over- or underreacting to noises, touch, lights, or sudden movements;
- Irritable, angry, or aggressive;
- Challenges authority and sensitive to criticism or direction;
- Difficulty paying attention or concentrating;
- Absenteeism;
- Restlessness or increase in energy;
- Headaches, stomachaches, or other physical symptoms;
- Distrust of others and trouble with relationships;
- Withdrawing from activities or socializing;
- Trouble sleeping or nightmares;
- Feeling numb or indifferent about the traumatic event;
- Increased impulsivity, risk-taking, and drug/alcohol use; and
- Frequently thinking about or talking about death.

While some children may be diagnosed with specific trauma-related disorders like post-traumatic stress disorder (PTSD), others may not meet the threshold for a diagnosis. Some mental health experts have argued that a new diagnosis, Complex PTSD (CPTSD), be added to the Diagnostic and Statistical Manual of Mental Disorders (DSM) to account for symptoms caused by long-term, severe stressors rather than a traumatic event. Researchers have found that the brain responds similarly to chronic stressors like food scarcity, poverty, or chaotic, dysfunctional, or unsupportive environments as it does to traumatic events (Odgers & Jaffee, 2013). This is also referred to as toxic stress because of the damage it can do to our cognitive, emotional, and physical health. Like a cut that never heals, toxic stress can cause us to become fearful, overprotective, and hyperaware of potential danger. Prolonged, heightened levels of the stress hormone **cortisol** can even cause neuronal damage in the **hippocampus**, the brain's memory center, and **prefrontal cortex**, the executive control center (Kandel, 2018). One study found that after the COVID-19 shutdowns, brain imaging showed that adolescent participants had brain features that looked more "typical of older people or those who experienced chronic stress or adversity in childhood" (Gotlib, 2022).

Learn more: Child Trauma Toolkit for Educators
bit.ly/3LtfTg3

In the 1990s, researchers looked at how highly stressful and potentially traumatic experiences – like abuse, familial instability, or witnessing violence – impact children. They defined them as Adverse Childhood Experiences (ACEs) and found that they can have lifelong physical, mental, and financial impacts (Felitti et al., 1998). ACEs increase the risk of developing mental health disorders as well as chronic diseases like cancer, heart disease, and diabetes. While discrimination (based on race/ethnicity, gender, sexuality, etc.) was not accounted for in the original study on ACEs, updated culturally informed models now include these stressors. Like other ACEs, emerging research has linked experiences of discrimination or bias to higher incidence of physical and mental health conditions. These health challenges can have astronomical impacts on educational and financial attainment, not to mention overall well-being. ACEs also aren't a small problem – current research indicates that nationwide, nearly half of children experience at least one ACE during childhood, and 1 in 10 will experience three or more ACEs, compounding their risk of serious negative impacts (Sacks & Murphey, 2018).

Whether diagnosed or not, students who have gone through a traumatic event or are exposed to chronic stressors – including negative school experiences – may need extra support and understanding. The vast majority of youth who have traumatic experiences will be able to overcome their challenges and lead healthy, successful lives (Souers & Hall, 2016).

As educators, we play an essential role in providing a safe and supportive environment which aids this process. Trauma-informed teaching requires acknowledging the potential negative impacts of trauma without lowering our expectations.

KEY TAKEAWAYS

- Emotions are the gas pedal of learning – at times, accelerating learning like a teenager with a new car, and other times, slowing learning to a complete standstill like we're stuck in the mud.
- Just as our own emotions are clues that help us decide how to act or behave in a given situation, students' emotions can give us clues about what they need from us in order to learn more effectively.
- No matter how much knowledge we impart to our students, if they lack social-emotional skills, they will struggle to apply what they've learned to real-life contexts.
- Mental health disorders commonly develop during adolescence and have been rising in adolescents over the past decade.
- Many mental health disorders have overlapping symptoms and oftentimes co-occur.
- While teachers shouldn't take on the role of therapist or social worker, learning about some of the most common mental health challenges and how they impact learning and behavior can be helpful.
- Depression can negatively impact concentration, memory, and motivation.
- Anxiety and trauma can both trigger fight, flight, freeze, or fawn mode and essentially shut down the learning centers of the brain. This is called the amygdala hijack.
- Researchers have found that the brain responds similarly to chronic stressors like food scarcity, poverty, or chaotic, dysfunctional, or unsupportive environments as it does to traumatic events (Odgers & Jaffee, 2013). This has been referred to as toxic stress because of the damage it can do to cognitive, emotional, and physical health.