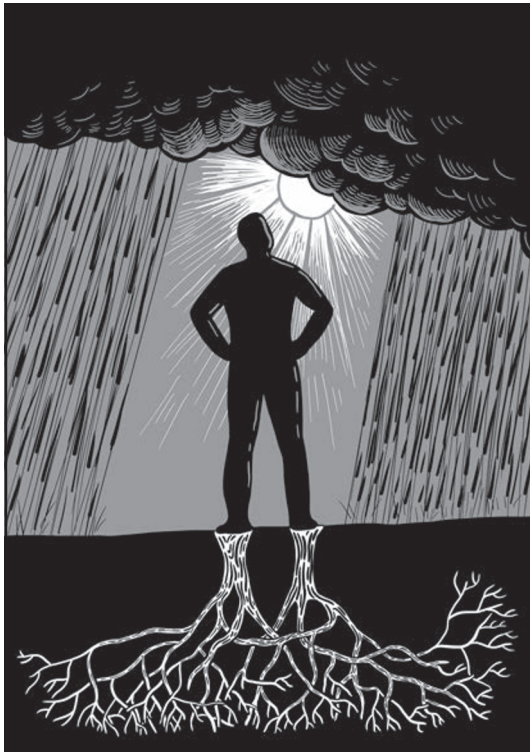


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What Is Resilience?



Even before the COVID-19 pandemic, serious traumas were remarkably common. Studies estimated that 69–90 percent of people would experience at least one serious traumatic event during their lives (Goldstein *et al.* 2016; Kilpatrick *et al.* 2013). Examples of these events include violent crime, domestic violence, sexual assault, child abuse, a serious car accident, the sudden death of a loved one, a debilitating disease, a natural disaster or war, or military combat. Though they are not often “counted” in these epidemiological studies, other stressors can have a devastating impact on well-being, including racial discrimination, emotional abuse (e.g., bullying or chronic insults or invalidation by caretakers or romantic partners), and homelessness.

We know that any one of these events can throw our lives into turmoil. For some, the stress of the event will become chronic, lasting for years. They may undergo a dramatic and lasting change in outlook, becoming withdrawn and angry. Some people will become depressed or develop post-traumatic stress disorder (PTSD). But what we also know is that this is far from the full story. Over our careers, the three of us have devoted much of our research and clinical work to defining, measuring, and fostering the missing piece – the human capacity for resilience.

What is *resilience*? While it has been defined in many ways by experts (Southwick *et al.* 2014), we see it as *the ability to weather and recover from adversity*. Here are a few important points about resilience to keep in mind while you are reading this book:

1. *Resilient people have faced challenges.* You cannot say a person is resilient unless they have had challenges thrown their way – they must be resilient *to, from, or following* some stressful or traumatic event.

2. *Resilience unfolds over time.* How someone is coping immediately after a traumatic or stressful event may not tell you very much at all about their resilience – because it is a process that unfolds over days, weeks, months, and years.
3. *Feeling distress does not mean someone is not resilient.* Resilient people may experience psychological symptoms such as depression, recurring upsetting memories, or intense self-blame following traumatic events – while still carrying on with important facets of their lives. Resilience can also be seen in the process of recovery from medical or mental health conditions.
4. *Resilience often involves growth.* Often people who go through challenging life events say they have grown in some way as a person and have a greater sense of personal meaning in life. This change, like many in life, can come after or during significant emotional pain.
5. *Resilience can differ across the life span.* One way of thinking or acting might be more helpful at one point in someone's life, but not at another. Think about a child who has no one to turn to in their life – they need to be self-sufficient and scrappy to survive and thrive. But when they get older and have more people around them who care for them, reaching out and asking for help in tough times would be a marker of personal resilience (Bhatnagar 2021).
6. *Resilience occurs in context.* Adaptation to stress depends not only on the individual but also on available resources: family, friends, specific cultures and religions, communities, societies, and governments. Many of these resources are outside a person's immediate control. We will return to this point at the end of this chapter.

Throughout the book we also draw upon events in our own lives that have informed how we think about resilience. Dennis Charney, dean of the Icahn School of Medicine, played a key role in directing Mount Sinai Health System's response to the COVID-19 pandemic. In 2016, well before the pandemic, he was shot by a former employee and had to undergo intensive rehabilitation. Steven Southwick

battled advanced cancer for five years and helped family members through their own medical challenges. Jonathan DePierro, the third author for this new edition, experienced extensive bullying in childhood that led to periods of depression. He was the first person in his immediate family to finish college and ultimately earned his PhD in clinical psychology. While this book mostly focuses on the many resilient people we have interviewed, you will hear a bit more about our life experiences in later chapters.

How We Became Interested in Resilience

Over the years, all three of us have examined the negative impact of having lived through overwhelming traumas. We started from the perspective of studying a psychiatric diagnosis – post-traumatic stress disorder. In our research, we learned a lot about how the body’s stress response is overactive in individuals with PTSD, and how this contributes to a range of potentially disabling symptoms. We treated Vietnam veterans who endured decades of emotional pain from their combat experiences.

But we often wondered too about survivors who seemed to somehow cope effectively with the negative effects of stress. These people either did not develop stress-related symptoms or if they did then they carried on and harnessed resources to support their recovery. The term “resilient” described these people well.

When we got started focusing on resilience, little was known about it. We had many questions and set about trying to answer them. Here are some of the things we wondered: What factors can help protect individuals from developing persistent symptoms following traumatic events? Is there something unique about their nervous system or genes? Have they been raised in a special manner? What about their personalities? Do they use specific coping mechanisms to deal with stress? If we learn more about how they

dealt with stress and trauma then will these lessons be helpful to others? Can someone learn to become more resilient?

Alongside many carefully designed research studies, some of which involved thousands of people, we were also interested in hearing individual stories of resilience. We decided to interview people who stood out to us as tremendously resilient. In the previous two editions, we shared stories from Vietnam prisoners of war (POWs) and United States Special Operations Forces instructors, 9/11 survivors, and other individuals who had not only survived enormous stress and trauma but had somehow endured or even thrived. Then, the COVID-19 pandemic, coming two years after our second edition of this book was released, provided an undeniable example of human resilience. Growing attention to racial injustice in the United States and geopolitical unrest added layers uncertainty, stress, and trauma. These more recent world events raised more questions: Did what we had learned about resilience “hold up”? How could we as authors, clinicians, and human beings learn from these jarring experiences?

You may have picked up this book because you have your own questions about resilience, or because you are struggling through a challenging event in your life. We hope that you find it helpful for the challenges you face now, and those you will no doubt encounter in the future. In the next sections, we will give you a preview of what is to come.

Ten Resilience Factors

Most of us will never become a prisoner of war, need a heart transplant, or step on a landmine, but we will inevitably face our own personal tragedies. Fortunately, to withstand, overcome, and grow from these experiences, we do not need to have superior genes, nor do we need to take a “tough as nails” approach to life or have trained

with elite military units. But we do need to prepare ourselves, for life has a way of surprising us with adversity when we least expect it.

We know of no better way to learn about tried-and-true methods for becoming more resilient than listening to and following the advice of people who have already “been there.” In our interviews with resilient people, we heard recurrent themes. The people we met

1. Confronted their fears
2. Maintained an optimistic but realistic outlook
3. Sought, accepted, and provided social support
4. Imitated sturdy role models.
5. Relied on an inner moral compass
6. Turned to religious or spiritual practices
7. Attended to their health and well-being
8. Remained curious, pushing themselves to learn new things
9. Approached problems with flexibility and, at times, acceptance
10. Found meaning and growth during and after their traumatic experiences

The next ten chapters focus on each one of these factors in more detail. In each chapter, we share personal stories, the latest scientific research, and practical suggestions for building resilience in your own life. We also recognize that our list is by no means definitive or complete and that other factors certainly contribute to resilience. Here are a few stories that have inspired us and informed our thinking about the ten factors.

Resilience Following 9/11

The terrorist attacks of September 11, 2001 were horrifying and disorienting events for hundreds of millions of people. While most everyone who was alive then can remember when they heard the news of the attacks, there were also those who witnessed it up close, lost someone

close to them, or directly responded to help in affected areas such as Ground Zero in lower Manhattan. Jimmy Dunne's compelling story provides just one example of individual resilience after 9/11.

On the clear, balmy morning of September 11th, Jimmy was enjoying a much needed day off work. But quickly his relaxation gave way to fear. He was stunned to learn that planes had crashed into the World Trade Center. His thoughts immediately turned to his work colleagues and dear friends who he knew were there. United Airlines Flight 175, a Boeing 767, struck the South Tower between the 78th and 84th floors, trapping hundreds on the floors above (Dwyer *et al.* 2002). His company, the financial services firm Sandler O'Neill, was located on the 104th floor.

Jimmy's worst fears were confirmed. Nearly one-third of Sandler's employees died that day. Among them were Jimmy's close friends and fellow managing partners, Chris Quackenbush and Herman Sandler. There were forty-six widows and widowers, and seventy-one children who lost a parent. The firm's operations systems were also crushed: all the company's paperwork and computer systems were destroyed. Through his grief, Jimmy decided to be a role model for his remaining staff: "The moment I heard what the terrorists wanted, I decided to do exactly the opposite. Osama Bin Laden wanted us to be afraid. I would show no fear. He wanted us to be pessimistic. I would be incredibly optimistic. He wanted anguish. I would have none of it."

Dunne made a series of momentous decisions. He and his staff would "do right by the families" by paying the salaries of the deceased employees through December 31, 2001; extending bonuses and healthcare benefits; setting up an education fund; and providing mental health counseling. They also decided to find a way to carry on with business, despite the long odds. By September 17, the day the New York Stock Exchange reopened, the firm was already set up in a temporary office. Dunne and his team saw rebuilding the firm as a moral imperative – a way of honoring their lost colleagues. Dunne's heartfelt emotion was the driving force in

his rescue of the firm. From the day of 9/11 onward, he and his team had a clear sense of purpose that guided every decision.

Throughout the book, we will share more about the two decades of research on the resilience of individuals affected by 9/11, including those living and working in lower Manhattan and those who responded or volunteered on the rescue and recovery efforts.

Resilience during COVID-19: Firsthand Accounts from Mount Sinai

As of early August 2022, when this chapter was written, approximately 6.4 million people worldwide had died from COVID-19. In March and April 2020, New York City became one of the global epicenters of the pandemic. You can probably remember being worried about your health or that of your loved ones in these early days, as the pandemic swept the globe. During this time, healthcare workers across the city helped to care for extremely ill patients, fearing that they would get infected and pass the virus on to their own families while doing their vitally important jobs. We lost colleagues, including from among our staff at the Mount Sinai Health System.

The pandemic was exhausting, terrifying, and traumatizing. Studies have shown increases in depression, anxiety, and loneliness, particularly during the early waves, which will need to be addressed for many years to come. Healthcare workers on the front lines of the pandemic, like their counterparts responding to 9/11 twenty years earlier, shouldered a heavy emotional burden. Our team began to survey healthcare workers early on. From that work, we know that 39 percent of frontline healthcare workers taking care of patients with COVID-19 at Mount Sinai Hospital reported significant symptoms of anxiety, depression, or PTSD (Feingold *et al.* 2021). It is a stark reminder that these individuals are humans first and providers second; and they were at the epicenter of the epicenter, making tough decisions and witnessing so much suffering and death.

Firsthand Accounts from Mount Sinai

Throughout the pandemic's many waves, there have been many examples of creativity, community support and collective strength, and determination. The human need for comfort and connection shone through the catastrophe. For example, amid clear risk to their own lives, healthcare workers across the country held up phones so that patients' families could say their goodbyes. Shauna Linn, a physician assistant at Mount Sinai during the first wave of the pandemic, shared this with us:

It was very terrifying emotionally, but also extremely meaningful and powerful because you felt like you were the only connection this person has to their loved one. I wasn't really mediating it per se. I just felt like I was kind of a vehicle through which she could see her mom, and I tried not to editorialize it or intervene too much, but I just tried to give her mom some, you know, hold her mom's hand, give her mom some tactile connection that she wasn't able to do. (Earle 2020b)

From our surveys of frontline healthcare workers, we learned about many factors that helped people cope, including social support from family, friends, and leaders; finding small positives amid the suffering; and having a sense of purpose (Feingold *et al.* 2021; Pietrzak *et al.* 2020). We will refer to this growing body of research many times in later chapters of the book.

In April 2020, one of us (Dennis) summarized the resilience factors he observed within the Mount Sinai community:

One is a positive sense of optimism, which is not easy in these times, but our doctors and our nurses ... have a sense of optimism that they're up to the task and that ultimately, we will prevail. That this will end at some point, and we will get back to normal activities. And I think they will look back upon this time and place as being, as Winston Churchill said, their Finest Hour. That when they were challenged, they were up to the challenge, did spectacular work ... I would [also] say support is very important. You have to function as a team now. You've got to be able to rely on each other 100 percent to take care of the patients that we're responsible for ... And I've heard this a lot from our staff and that is – this is what they are trained to do ... And a lot of them have the attitude: "If not us, who? Who's going to do it?" (Earle 2020a)

The experiences of our healthcare workers called us to action – we knew we had to use what we had learned about resilience to be of immediate help. In April 2020, we opened the Mount Sinai Center for Stress, Resilience, and Personal Growth (CSRPG). The primary mission of this unique center is to support the resilience of all Mount Sinai Health System employees, students, and trainees. Based on the same ten factors described in this book, CSRPG’s staff have used resilience training to support both healthcare workers and the community at large in New York City (DePierro *et al.* 2020, 2021). We partnered with many pastors in New York City in creating a resilience-building program for their congregants. Later on in the book, we will share the experiences of one of these pastors, Reverend Dr. Thomas Johnson, who helped lead Canaan Baptist Church in New York City through the worst parts of the pandemic.

A Nation Shows Resilience: The 2022 Invasion of Ukraine

In the years since the second edition of this book was published, there has been rising global uncertainty. War and persecution in multiple countries, including Venezuela and Syria, have fueled a refugee crisis. We saw one stunning example of a conflict with global implications when, in February 2022, Russian forces invaded Ukraine without provocation. A major global superpower bore down on a country whose military was comparably smaller. Over 20,000 Russian troops poured into the country, along with thousands of tanks, missile platforms, and armored personnel carriers. Ukraine did not back down – it faced its fears, with the clear mission of protecting its citizens and its land. Those who could stay took up arms to defend cities block by block, allowing over a million people to flee.

As the world looked on, and no other country directly intervened, Putin's anticipated early victory was upended by the bravery of the Ukrainian people. As of the fall of 2022, they are still fighting. This spirit has been best exemplified in part by the words and actions of their president, Volodymyr Zelenskyy. Declining an offer to evacuate the country for safety early in the invasion, he stated, "I need ammunition, not a ride." On March 8, 2022, in a virtual speech to the UK Parliament, he echoed British Prime Minister Winston Churchill's inspirational words, saying: "We will fight till the end, at sea, in the air. We will continue fighting for our land, whatever the cost."

Later in the book, we will hear from Dr. Preethi Pirlamarla, a Mount Sinai cardiologist, who provided medical aid as part of a relief effort in Poland, near the Ukrainian border.

Extraordinary Experiences of Military Service Members

Many years ago, we sat down for in-depth interviews with former US prisoners of war. Most of those we spoke with were pilots who had been captured when their planes were shot down over North Vietnam. After ejecting from disabled burning fighter jets flying at speeds of greater than 400 miles per hour, they parachuted into the jungle. After being captured, they were often paraded through crowds of hostile villagers before being interrogated, beaten, and tortured. They were given meager portions of barely edible food: a chicken head in grease, a piece of bread covered with mold, the hoof of a cow, an occasional tiny piece of pig fat, or a handful of rice that might be full of rat feces, weevils, or small stones.

All the POWs we interviewed were deeply affected emotionally by their imprisonment, isolation, and torture. Many developed

trauma-related mental health conditions and had trouble adjusting to civilian life when they got back home. However, they also discussed how they gained a greater appreciation of life, closer connections with family, and a newfound sense of meaning and purpose because of their prison experience. From their stories of survival, we learned that social support, having a moral compass, and physical fitness were important, as were other strategies.

In addition to POWs, we spoke to members of the United States Special Operations Forces, including retired Rear Admiral Scott P. Moore. From him, we learned that failure is not something to fear because it can make us stronger.

Examples from Other Individuals Facing Life's Challenges

In addition, we interviewed people from all walks of life who faced or continue to face a range of difficulties. Here are a few examples.

Congenital medical issues:

- Deborah Gruen, born with spina bifida, won bronze medals in swimming in the 2004 and 2008 Paralympics. She competed as a member of Yale University's women's varsity swim team and graduated from the university *summa cum laude*, attended Georgetown University Law School, and went on to a career with a prestigious law firm.

Life-altering injuries:

- Dr. Jake Levine, an athlete since early childhood, sustained ten sports-related concussions that developed debilitating aftereffects; after daily grueling rehabilitation, he contracted a near fatal heart infection while researching PTSD and resilience in Japan. He

completed medical school and is now starting a residency at Mount Sinai to become a physician specializing in physical rehabilitation.

Global conflict:

- Dennis Chung and his family fled persecution in Vietnam, crammed on a boat with hundreds of others. He started with nothing in the United States, and ultimately saved and borrowed enough to start his own restaurant in lower Manhattan. Dennis put his two children through college and graduate school. His son, Tony, is a biomedical sciences graduate student at the Icahn School of Medicine.

The Science of Resilience

Now that we have defined resilience, we want to say a little bit about what we have learned about the biology behind it. Our research has shown us that physiological responses before, during, and after traumatic events all play a role in resilience. We will focus on three different components: (1) the brain, (2) the autonomic nervous system, and (3) hormones.

Let's start with the brain. Many brain regions have been associated with resilience (see Figure 1). It is important to say here that, as with most human experiences, we have a limited understanding of the true complexity of what is happening in the brain – often, we have a snapshot of the brain at one point in time, during lab experiments that might not match someone's real life experiences very well. Here are a few key brain regions you should know about:

- The *amygdala* is involved in our fear responses and learning which situations are safe and which are dangerous. We will say more about learning (and unlearning) fear responses and the role of the amygdala in Chapter 3. People with PTSD and a range of anxiety disorders have

What is Resilience?

overactivity in the amygdala – their alarm bells are going off constantly even when there is no threatening situation in front of them.

- The *prefrontal cortex* (PFC), which is often referred to as the brain's "executive center," facilitates planning and rational decision-making. It helps to regulate emotions and acts to keep the amygdala in check. When you are feeling very anxious and decide to text a friend or go for a run, that is your PFC helping you carry out a plan to feel better. In conditions like PTSD, the prefrontal cortex is thought to be underactive, leaving the individual with raw, unchecked experiences of fear, sadness, anger, and guilt.
- The *hippocampus* plays a critical role in learning, forming new memories, and regulating the stress response. Learning from experience and recalling helpful memories of past success play an undeniable role in resilience as we understand it. We also know from laboratory studies that chronic uncontrolled stress may lead to damage to the hippocampus, complicating recovery.
- The *nucleus accumbens*, sometimes referred to as the "pleasure center"; in association with another part of the brain called the ventral tegmental area, it mediates the experience of reward and the avoidance of punishment. It is associated with the pleasurable effects of food, sex, and drug abuse.

These brain regions and a few others will be mentioned in due course. As you read, you can come back to Figure 1 to remind yourself of where in the brain these regions are located and what functions they serve.

Next on our list is the autonomic nervous system or ANS. It is, simply put, a set of nerves throughout our body that send signals to our organs and muscles. The ANS has two branches that work together: the sympathetic (SNS) and the parasympathetic (PNS) nervous systems. Whether we are running from a bear in the woods or doing laps around a track, the SNS sends out signals to use up energy and get us moving quickly. When the SNS is doing its job, your blood pressure

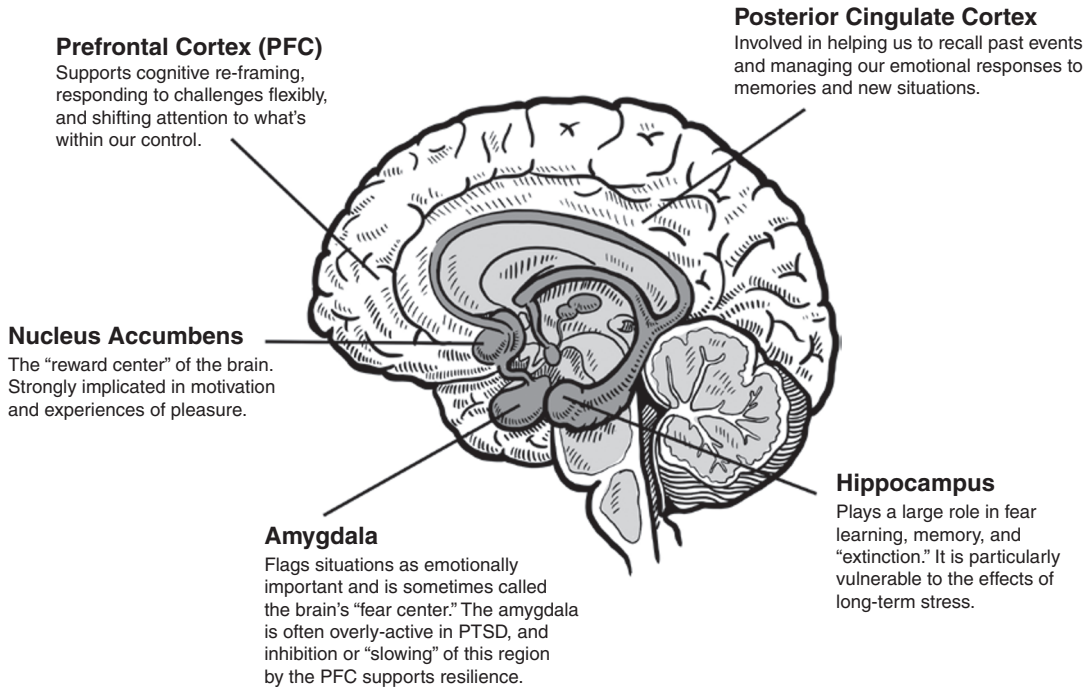


Figure 1 Regions of the human brain

and heart rate go up, digestion stops, and you sweat. But you cannot stay like that forever. The PNS is involved in recovering from stress, and in making and storing energy for the next time a response is needed. For healthy functioning, it is beneficial for the SNS to have a robust temporary response to stress but for you to recover quickly.

Throughout the book we will also refer to various hormones and neurotransmitters that are involved in our stress response and resilience.

- *Cortisol* is a stress hormone that helps the body produce the energy it needs by facilitating the creation and release of glucose (a form of sugar)
- *Epinephrine*, also known as adrenaline, is released by the adrenal glands under conditions of stress. It accelerates heart rate and widens airways as part of the fight-or-flight response to make more oxygen available.
- *Norepinephrine*, also known as noradrenaline, is also part of the SNS. It facilitates alerting and alarm reactions in the brain, and is critical for responding to danger and for remembering emotional events.

Cortisol in particular plays a big role in the hypothalamic–pituitary–adrenal (HPA) axis, which responds to stress with a complex set of reactions. This cycle involves the hypothalamus and pituitary gland, both buried deep in the middle of the brain – and the adrenal glands – which sit atop the kidneys. Cortisol is known as the “stress hormone” because it is released for a short time during stressful situations, and it helps the body to gather the energy it needs to respond. Later in the book, we will also talk about oxytocin, which is a hormone associated with maternal behaviors, social communication, trust, social support, and anxiety reduction.

Our understanding of how these systems support resilience can be likened to shifting gears in a car. You know that when you come up to a steep hill, you must push hard on the accelerator pedal to get up and over it. But once you’re over the hill, you must let go of that pedal and work the brakes, or risk losing control of the car. People who are resilient can pump the gas when they need to – by

having a clear biological response to the challenging situation – and can slow down and recover when the situation is over. Individuals with PTSD may have problems with some of this biological flexibility; to keep the comparison going, they may be still pumping the accelerator pedal many miles past the hill.

Genetics and Epigenetics

Are we biologically “stuck” with what happened to our parents, grandparents, or far distant relatives? Articles, books, and TV shows mentioning *intergenerational transmission of trauma* have become increasingly common. Luckily our colleagues, including Dr. Rachel Yehuda and Dr. Eric Nestler, are closely involved in careful scientific work in this area. To help you understand what we do and don’t yet know about the intergenerational transmission of trauma (and resilience), we should first say a bit about genetics.

The genes we share – that make us all human beings and that make each of us slightly different – are inherited from our parents. But, in the womb, and certainly after we are born, we begin to have experiences that also shape us. We call this the “environment.” We are raised by parents or other caregivers. We experience successes, hardships, and life-threatening events – some completely on our own and some with our family.

Scientists have asked the obvious question: Do our genes drive our emotional well-being when we encounter life’s challenges or is it our environment? The answer turns out to be that both are important. In a longitudinal study involving over 3,000 adult twins – both identical (monozygotic) and fraternal (dizygotic) – researchers found that genetic and environmental factors had roughly equal contributions to the development of PTSD. But for resilience, environmental factors (such as positive or negative life events) had a slightly bigger impact than genetics (Wolf *et al.* 2018). From this we

learn that resilience is not just the opposite of PTSD. It also reminds us that it is not only what happens to us in our lives (including some things that are completely outside our control) but also the things we choose to do that contribute to our resilience.

There's one more term you need to know – *epigenetics*. This is the study of how the environment impacts the functioning of genes. Imagine a string of lights hanging from your ceiling – those are your genes. Simply put, epigenetic changes would be equivalent to flicking a switch to turn any one light off or on. It does not change the string of lights itself – just how parts of it operate for a time. Many things (traumatic life events, diet, exercise, even meditation) can trigger relatively small epigenetic changes that turn some genes on and others off within specific brain regions. These changes could change how someone acts or feels.

We learned about epigenetics in part from research with rat mothers and their babies (“pups”). Just as for humans, there's variability in how these mothers raise their young – in particular, some rat mothers lick and groom their pups more than other mothers do. This turns out to be quite helpful later – pups who got more licking and grooming tended to be less fearful and calm down faster in lab experiments. In other words, they were more resilient. When scientists tried to understand how parenting influenced pup behaviors, they discovered that the highly groomed pups had helpful changes in the *activity* of genes related to the HPA axis (which we talked about in the last section) in their brains – mediated by epigenetic mechanisms. A mother's behavior did not change the gene itself, but what the pup did (O'Donnell & Meaney 2020). You might have caught that these changes occurred after the pups were born.

If life experiences can impact how genes function, can we also pass along certain biological protections or risk factors to our children before they are even born? In other words, is there scientific evidence for the intergenerational transmission of trauma? Our colleague Dr. Yehuda has done foundational work studying

epigenetic changes in the children of Holocaust survivors and individuals impacted by the 9/11 terrorist attacks (Yehuda 2022). This “transmission” is extremely challenging to study; it often involves looking at stress-induced epigenetic changes within sperm or eggs prior to conception to make inferences about even just one generation. Dr. Nestler’s work with mice has shown a *very small* impact of a father’s life adversity on their pups’ stress resilience, transmitted through changes in the father’s sperm (Cunningham *et al.* 2021).

A few words of caution. The scientific evidence we have around intergenerational transmission in no way matches up with the intense excitement (or dismay) that has erupted over the past few years. We know that it is the physical genes (our DNA sequence) and our own life experiences that are likely to have the largest impact on our physical and emotional well-being, *not* stress-induced epigenetic changes passed from parents to children.

You should also know that the research we mentioned focuses on the activity of genes that *may* influence how you respond to stress; it does not show that PTSD as a diagnosis is “transmitted” genetically or through epigenetic mechanisms. Finally, because any stress-induced epigenetic changes do not change the structure of our genes, we have every reason to believe that positive life events and behaviors within our control, including those mentioned later in this book, could reverse them. Biology is not destiny.

Neuroplasticity

In several chapters, we mention neuroplasticity. Neuroplasticity refers to the ability of the brain and the rest of the nervous system to reorganize its structure, function, and connections in response to new experiences. While many of us think of the brain as an organ that remains unchanged during adulthood, neuroscientists have found that brain structure changes from moment to moment, hour

to hour, day to day. When cells in the brain are actively used, they transmit their messages more efficiently and form more connections with other cells. On the other hand, when brain cells are not stimulated, they die and are “pruned” away.

In research dating back to the mid-1990s, neuroscientists found compelling evidence of changes in the brain among professionals as they honed their craft. For example, researchers studied wind instrument players and found enlargement in areas of the brain responsible for lip movement. Further, the greater the number of years of musical training, the more pronounced the brain changes (Choi *et al.* 2015).

Another line of research focuses on the impact of mindfulness meditation, which is thought to build awareness and acceptance of the present moment, including bodily sensations, and may improve the ability to cope with stress. A recent study of brain changes following mindfulness practices (Pernet *et al.* 2021) found that there is a reliable increase in the volume of the right insula – a part of the brain thought to be involved in body awareness – after meditation practice. We see, then, a match between what people practice and the brain area that increases in size as it is called upon more.

In some way, each of us has the power to change the structure and function of our brains. The key is activity. By repeatedly activating specific areas of the brain, we can strengthen those areas. In other words, by systematically following the advice of the individuals in this book, virtually anyone can become more stress-resilient – even in small ways.

Everyone Has Strengths – Some People Have More Resources Available to Them

When we began to study resilience thirty years ago, we assumed that highly resilient people were somehow special, even genetically gifted. We assumed that resilience was rare, reserved for a select

group of unique individuals. We were wrong. Resilience is common. It can be witnessed all around us, and for most people it can be enhanced through learning and training. Millions of people all over the world exhibit resilience in their responses to challenging events and circumstances of all kinds. Most of us have been taught to believe that stress is bad. We have learned to see stress as our enemy, something that we must avoid or reduce. But the truth is, when stress can be managed, it can be motivating, and even necessary for personal growth.

And yet we need to acknowledge that building resilience and bouncing back is easier for some than it is for others. Some severe medical and mental health challenges people face may make it hard to put into practice the advice we offer in this book. For example, someone who is experiencing an episode of major depression may be weighed down by the profound sadness and sense of hopelessness, lack of energy, and loss of interest in life. Someone who has suffered a traumatic brain injury may have difficulties implementing plans on their own and may struggle with extreme mood swings. People with these conditions who want to practice the skills associated with resilience would certainly be advised to work with a trained professional.

At the same time, we should also acknowledge the reality of privileges that may be conferred by race and certain other identities in our society. Further, those of us with resources such as financial security, a stable career with good health and leave benefits, and a rich social support network can leverage these resources when the unexpected happens. People who lack these resources may fall into what psychologist Stevan Hobfoll (2001) has called a “loss spiral.” One problem can compound another. For example, if a family already under financial strain loses a parent who is the primary earner, the surviving family members may be forced to scramble for ways to pay for food and housing. A financially secure family may have the resources to address their grief and loss in many ways

(such as by paying for counseling, hosting a funeral to honor their loved one, and taking time off from work or school to reevaluate their life priorities).

This does not mean that those with fewer resources should give up, but it must be recognized that they will have a more difficult road to travel. Understanding these limitations may allow us to be more patient and understanding with ourselves or with others who are striving to recover from trauma.

We hope that the words and deeds of the generous individuals in this book will be as inspirational to you as they have been to us, and that these individuals will serve as role models for you as you face the upcoming challenges of your life. When we have encountered challenges in our lives, each of us has turned to conversations we had with those individuals. As clinicians treating patients with post-traumatic symptoms, we have also been privileged to witness how they connected to personal strengths amid intense suffering. We try to follow their advice by learning from a specific attitude, style of thinking, emotion, or behavior that helped them.

