

# 6 KEY QUESTIONS ABOUT ADDICTION

Excerpts From The Award-Winning *In The Realm Of Hungry Ghosts*

By Dr. Gabor Maté

# 6 Key Questions About Addiction

Excerpts From The Award-Winning *In The Realm Of Hungry Ghosts: Close Encounters with Addiction*

In this free guide, explore answers to some of the most common questions surrounding the nature of addiction:

**What is addiction?**

**How does the environment shape addiction?**

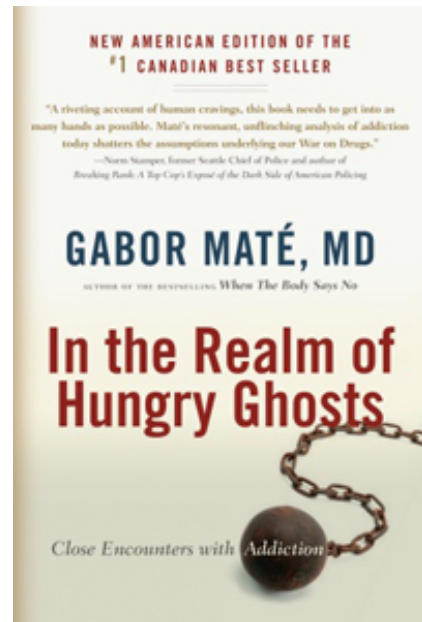
**What can early childhood experience tell us about addiction?**

**Does parental attachment play a role in addiction?**

**How does trauma contribute to addiction?**

**What is the role of stress on addiction?**

Countering prevailing notions of addiction as either a genetic disease or an individual moral failure, Dr. Maté presents an eloquent case that addiction – all addiction – is in fact a case of human development gone askew.



# #1. WHAT IS ADDICTION?

Addicts and addictions are part of our cultural landscape and lexicon. We all know who and what they are—or think we do. To understand addiction, let's start by looking at it from a scientific perspective, beginning with a working definition of addiction. And let's dispel some common misconceptions.

In the English language addiction has two overlapping but distinct meanings. In our day, it most commonly refers to a dysfunctional dependence on drugs or on behaviours such as gambling or sex or eating. Surprisingly that meaning is only about a hundred years old. For centuries before then, at least back to Shakespeare, addiction referred simply to an activity that one was passionate about or committed to, gave one's time to. "Sir, what sciences have you addicted yourself to," someone asks the knight Don Quixote in an eighteenth-century English translation of the Cervantes classic. In the nineteenth-century *Confessions of an English Opium Eater*, Thomas De Quincey never once refers to his narcotic habit as an addiction, even if by our current definition it certainly was. The pathological sense of the word arose in the early twentieth century.

The term's original root comes from the Latin *addicere*, "assign to". That yields the word's traditional, innocuous meaning: a habitual activity or interest, often with a positive purpose. The Victorian-era British politician William Gladstone wrote about "addiction to agricultural pursuits," implying a perfectly admirable vocation. But the Romans had another, more ominous usage that speaks to our present-day interpretation: an *addictus* was a person who, having defaulted on a debt, was assigned to his creditor as a slave—hence, addiction's modern sense as enslavement to a habit. De Quincey anticipated that meaning when he acknowledged "the chain of abject slavery" forged by his narcotic dependence.

How then, does modern society define addiction? In the words of a consensus statement by addiction experts in 2001, addiction is a "chronic neurobiological disease . . . characterized by behaviours that include one or more of the following: impaired control over drug use, compulsive use, continued use despite harm, and craving." The key features of substance addiction are the use of drugs or alcohol despite negative consequences, and relapse. I've heard some people shrug off their addictive tendencies by saying, for example, "I can't be an alcoholic. I don't drink that much . . ." or "I only drink at certain times." The issue is not the quantity or even the frequency, but the impact.

“An addict continues to use a drug when evidence strongly demonstrates the drug is doing significant harm. . . . If users show the pattern of preoccupation and compulsive use repeatedly over time with relapse, addiction can be identified.”

Helpful as such definitions are, we have to take a broader view to understand addiction fully. There is a fundamental addiction process that can express itself in many ways, through many different habits. The use of substances like heroin, cocaine, nicotine and alcohol are only the most obvious examples, the most laden with the risk of physiological and medical consequences. Many behavioural, nonsubstance addictions can also be highly destructive to physical health, psychological balance, and personal and social relationships.

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Taking this into account, let's consider addiction as any repeated behaviour, substance-related or not, in which a person feels

compelled to persist, regardless of its negative impact on his life and the lives of others. Addiction involves:

- i. compulsive engagement with the behaviour, a preoccupation with it
- ii. temporary pleasure or relief or elation from the behaviour or substance
- iii. impaired control over the behaviour
- iv. persistence or relapse, despite evidence of harm
- v. dissatisfaction, irritability or intense craving when the object—be it a drug, activity or other goal—is not immediately available

**Addiction is any repeated behaviour, substance-related or not, which brings temporary relief or pleasure, and in which a person feels compelled to persist, regardless of its negative long-term impact on his life and the lives of others.**

Compulsion, short-term relief, impaired control, persistence, irritability, relapse and craving—these are the hallmarks of addiction—any addiction.

Not all harmful compulsions are addictions, though: an obsessive-compulsive, for example, also has impaired control and persists in a ritualized and psychologically debilitating behaviour such as, say,

repeated hand washing. The difference is that he has no craving for it and, unlike the addict, he gets no kick out of his compulsion.

## **Not all harmful compulsions are addictions.**

How does the addict know she has impaired control? Because she doesn't stop the behaviour in spite of its ill effects. She makes promises to herself or others to quit, but despite pain, peril and promises, she keeps relapsing. There are exceptions, of course. Some addicts never recognize the harm their behaviours cause and never form resolutions to end them. They stay in denial and rationalization. Others openly accept the risk, resolving to live and die "my way."

All addictions—whether to drugs or to nondrug behaviours—share the same brain circuits and brain chemicals. On the biochemical level the purpose of all addictions is to create an altered physiological state in the brain. This can be achieved in many ways, drug taking being the most direct. So an addiction is never purely "psychological"; all addictions have a biological dimension.

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And here a word about dimensions. We need to avoid the trap of believing that addiction can be reduced to the actions of brain chemicals or nerve circuits or any other kind of neurobiological, psychological or sociological data.

Because the addiction process is too multifaceted to be understood within any limited framework, my definition of addiction makes no mention of “disease.” Viewing addiction as an illness, either acquired or inherited, narrows it down to a medical issue. It does have some of the features of illness, and these are most pronounced in hardcore drug addicts like the ones I worked with in the Downtown Eastside. But not for a moment do I wish to promote the belief that the disease model by itself explains addiction or even that it’s the key to understanding what addiction is all about. Addiction is “all about” many things.

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A multilevel exploration is necessary because it's impossible to understand addiction fully from any one perspective, no matter how accurate. Addiction is a complex condition, a complex interaction between human beings and their environment. We need to view it simultaneously from many different angles—or, at least, while examining it from one angle, we need to keep the others in mind. Addiction has biological, chemical, neurological, psychological, medical, emotional, social, political, economic and spiritual underpinnings—and perhaps others I haven't thought about. To get anywhere near a complete picture we must keep shaking the kaleidoscope to see what other patterns emerge.

**Addiction is a complex condition, a complex interaction between human beings and their environment.**

With this in mind, let's now explore some of the factors that influence addiction.

# #2. HOW DOES THE ENVIRONMENT SHAPE ADDICTION?

The idea that the environment shapes brain development is a very straightforward one, even if the details are immeasurably complex. Think of a kernel of wheat. No matter how genetically sound a seed may be, factors such as sunlight, soil quality and irrigation must act on it properly if it is to germinate and grow into a healthy adult plant. Two identical seeds, cultivated under opposing conditions, would yield two different plants: one tall, robust and fertile; the other stunted, wilted and unproductive. The second plant is not diseased: it only lacked the conditions required to reach its full potential. Moreover, if it does develop some sort of plant ailment in the course of its life, it would be easy to see how a deprived environment contributed to its weakness and susceptibility. The same principles apply to the human brain.

The three dominant brain systems in all addictions—the opioid attachment-reward system, the dopamine-based incentive-motivation apparatus and the self-regulation areas of the prefrontal cortex—are all exquisitely fine-tuned by the environment. To various degrees, in all

addicted persons these systems are out of kilter. The same is true, we will see, of the fourth brain-body system implicated in addiction: the stress-response mechanism.

Happy, attuned emotional interactions with parents stimulate a release of natural opioids in an infant's brain. This endorphin surge promotes the attachment relationship and the further development of the child's opioid and dopamine circuitry. On the other hand, stress reduces the numbers of both opiate and dopamine receptors. Healthy growth of these crucial systems—responsible for such essential drives as love, connection, pain relief, pleasure, incentive and motivation—depends, therefore, on the quality of the attachment relationship. When circumstances do not allow the infant and young child to experience consistently secure interactions or, worse, expose him to many painfully stressing ones, maldevelopment often results.

# **#3. WHAT CAN EARLY CHILDHOOD EXPERIENCE TELL US ABOUT ADDICTION?**

Dopamine levels in a baby's brain fluctuate, depending on the presence or absence of the parent. In four-month-old monkeys major alterations of dopamine and other neurotransmitter systems were found after only six days of separation from their mothers. "In these experiments," writes Dr. Steven Dubovsky, "loss of an important attachment appears to lead to less of an important neurotransmitter in the brain. Once these circuits stop functioning normally, it becomes more and more difficult to activate the mind."

We know from animal studies that social-emotional stimulation is necessary for the growth of the nerve endings that release dopamine and for the growth of receptors to which dopamine needs to bind in order to do its work. Even adult rats and mice kept in long-term isolation will have a reduced number of dopamine receptors in the midbrain incentive circuits and, notably, in the frontal areas implicated

in addiction. Rats separated from their mothers at an early stage display permanent disruption of the dopamine incentive-motivation system in their midbrains. Abnormalities in this system play a key role in the onset of addiction and craving. Predictably, in adulthood these maternally deprived animals exhibit a greater propensity to self-administer cocaine. It doesn't take extreme deprivation: in another study, rat pups deprived of their mother's presence for only one hour a day during their first week of life grew up to be much more eager than their peers to take cocaine on their own. So the presence of consistent parental contact in infancy is one factor in the normal development of the brain's neurotransmitter systems; the absence of it makes the child more vulnerable to "needing" drugs of abuse later on to supplement what her own brain is lacking.

Another key factor is the quality of the contact the parent provides, and this depends very much on the parent's mood and stress level. All mammalian mothers—and many human fathers, as well—give their infants sensory stimulation that has long-term positive effects on their offspring's brain chemistry. Such sensory stimulation is so necessary for the human infant's healthy biological development that babies who are never picked up simply die. They stress themselves to death. Premature babies who have to live in incubators for weeks or months have faster brain growth if they are stroked for just ten minutes a day.

When I learned such facts in the research literature, I recalled with appreciation a custom I had often observed among my Indo-Canadian patients during my years in family practice. As they were speaking with me during their early post-natal visits, these mothers would massage their babies all over their bodies, gently kneading them from feet to head. The infants were in bliss.

Humans hold and cuddle and stroke; rats lick. A 1998 study found that rats whose mothers had given them more licking and other kinds of nurturing contact during their infancy had, as adults, more efficient brain circuitry for reducing anxiety. They also had more receptors on their nerve cells for benzodiazepines, natural tranquillizing chemicals found in the brain. I think here of my many former patients who, on top of cocaine and heroin addictions, have been hooked since their adolescence on street-peddled “benzo” drugs like Valium to calm their jangled nervous systems. For a dollar a tablet, they get an artificial hit of the benzodiazepines their own brains can’t supply. Their need for tranquillizers says much about their infancy and early childhood.

# #4. DOES PARENTAL ATTACHMENT PLAY A ROLE IN ADDICTION?

Parental nurturing influences levels of dopamine, but it also determines the levels of other key brain chemicals, too—including serotonin, the mood messenger enhanced by antidepressants like Prozac. Peer-reared monkeys, separated from their mothers, have lower lifelong levels of serotonin than monkeys brought up by their mothers. In adolescence these same monkeys are more aggressive and are far more likely to consume alcohol in excess. We see similar effects with other neurotransmitters that are essential in regulating mood and behaviour, such as norepinephrine. Even slight imbalances in the availability of these chemicals are manifested in aberrant behaviours like fearfulness and hyperactivity, and increase the individual's sensitivity to stressors for a lifetime. In turn, such acquired traits increase the risk of addiction.

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Another effect of early maternal deprivation appears to be a permanent decrease in the production of oxytocin, which is one of our love chemicals. It is critical to our experience of loving attachments and even to maintaining committed relationships. People who have difficulty forming intimate relationships are at risk for addiction; they may turn to drugs as “social lubricants.”

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Not only can early childhood experience lead to a dearth of “good” brain chemicals; it can also result in a dangerous overload of others. Maternal deprivation and other types of adversity during infancy and childhood result in chronically high levels of the stress hormone



cortisol. In addition to damaging the midbrain dopamine system, excess cortisol shrinks important brain centres such as the hippocampus—a structure important for memory and for the processing of emotions—and disturbs normal brain development in many other ways, with lifelong repercussions. Another major stress chemical that's permanently overproduced after insufficient early maternal contact is vasopressin, which is implicated in high blood pressure.

A child's capacity to handle psychological and physiological stress is completely dependent on the relationship with his parent(s). Infants have no ability to regulate their own stress apparatus, and that's why they will stress themselves to death if they are never picked up. We acquire that capacity gradually as we mature—or we don't, depending on our childhood relationships with our caregivers. A responsive, predictable nurturing adult plays a key role in the development of our healthy stress-response neurobiology.

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In the words of one researcher, “maternal contact alters the neurobiology of the infant.” Children who suffer disruptions in their attachment relationships will not have the same biochemical milieu in their brains as their well-attached and well-nurtured peers. Their experiences, interpretations and responses to their environment will be less flexible, less adaptive and less conducive to health and maturity. Their vulnerability will increase, both to the mood-enhancing effect of drugs and to becoming drug dependent. We know from animal studies, for example, that early weaning can have an influence on later substance intake: rat pups weaned from their mothers at two weeks of age had, as adults, a greater propensity to drink alcohol than pups weaned just one week later.

Inborn temperamental traits interact with deficiencies in the nurturing environment to produce susceptibility to addiction. The statistics that reveal the typical childhood of the hardcore drug addict have been reported widely but, it seems, not widely enough to have had the impact they ought to on mainstream medical, social and legal understandings of drug addiction.

# #5. HOW DOES TRAUMA CONTRIBUTE TO ADDICTION?

Studies of drug addicts repeatedly find extraordinarily high percentages of childhood trauma of various sorts, including physical, sexual and emotional abuse. One group of researchers was moved to remark that “our estimates . . . are of an order of magnitude rarely seen in epidemiology and public health.” Their research, the renowned ACE (Adverse Childhood Experiences) study, looked at the incidence of ten separate categories of painful circumstances—including family violence, parental divorce, drug or alcohol abuse in the family, death of a parent and physical or sexual abuse—in thousands of people. The correlation between these figures and substance abuse later in the subjects’ lives was then calculated. For each adverse childhood experience, or ACE, the risk for the early initiation of substance abuse increased between two and fourfold. Subjects with five or more ACEs had seven to ten times greater risk for substance abuse than those with none.

The ACE researchers concluded that nearly two-thirds of injection drug use can be attributed to abusive and traumatic childhood events—and keep in mind that the population they surveyed was a relatively healthy and stable one. A third or more were college graduates, and most had at least some university education. With my former patients, the childhood trauma percentages would run close to one hundred. Of course, not all addicts were subjected to childhood trauma—although most hardcore injection users were—just as not all severely abused children grow up to be addicts.

## **Nearly two-thirds of injection drug use can be attributed to abusive and traumatic childhood events.**

According to a review published by the [U.S.] National Institute on Drug Abuse in 2002, “the rate of victimization among women substance abusers ranges from 50% to nearly 100% . . . Populations of substance abusers are found to meet the [diagnostic] criteria for post-traumatic stress disorder . . . those experiencing both physical and sexual abuse were at least twice as likely to be using drugs than those who experienced either abuse alone.” Alcohol consumption has a similar pattern: those who had suffered sexual abuse were three

times more likely to begin drinking in adolescence than those who had not. For each emotionally traumatic childhood circumstance, there is a two- to-threefold increase in the likelihood of early alcohol abuse.

“Overall, these studies provide evidence that stress and trauma are common factors associated with consumption of alcohol at an early age as a means to self-regulate negative or painful emotions,” write the ACE researchers.

It’s just as many substance addicts say: they self-medicate to soothe their emotional pain—but more than that, their brain development was sabotaged by their traumatic experiences. The systems subverted by addiction—the dopamine and opioid circuits, the limbic or emotional brain, the stress apparatus and the impulse control areas of the cortex—just cannot develop normally in such circumstances.

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experiences.**

Early trauma also has consequences for how human beings respond to stress all their lives, and stress has everything to do with addiction.

# #6. WHAT IS THE ROLE OF STRESS ON ADDICTION?

Stress is a physiological response mounted by an organism when it is confronted with excessive demands on its coping mechanisms, whether biological or psychological. It is an attempt to maintain internal biological and chemical stability, or homeostasis, in the face of these excessive demands. The physiological stress response involves nervous discharges throughout the body and the release of a cascade of hormones, chiefly adrenaline and cortisol. It affects virtually every organ, including the heart and lungs, the muscles and, of course, the emotional centres in the brain. Cortisol itself acts on the tissues of almost every part of the body, in one way or another—from the brain to the immune system, from the bones to the intestines. It is an important part of the infinitely intricate system of checks and balances that enables the body to respond to a threat.

At a conference on stress at the U.S. National Institutes of Health, researchers defined stress “as a state of disharmony or threatened homeostasis.” According to such a definition, a stressor “is a threat,

real or perceived, that tends to disturb homeostasis.” What do all stressors have in common? Ultimately they all represent the absence of something that the organism perceives as necessary for survival—or its threatened loss. The threat itself can be real or perceived. The threatened loss of food supply is a major stressor. So is the threatened loss of love—for human beings. “It may be said without hesitation that for man the most important stressors are emotional,” wrote the pioneering Canadian stress researcher and physician Hans Selye.

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Early stress establishes a lower “set point” for a child’s internal stress system: such a person becomes stressed more easily than normal throughout their life. Dr. Bruce Perry is Senior Fellow at the Child Trauma Academy in Houston, Texas, and the former Director of Provincial Programs for Children’s Mental Health in Alberta. As he points out, “A child who is stressed early in life will be more overactive

and reactive. He is triggered more easily, is more anxious and distressed. Now, compare a person—child, adolescent or adult—whose baseline arousal is normal with another whose baseline state of arousal is at a higher level. Give them both alcohol: both may experience the same intoxicating effect, but the one who has this higher physiological arousal will have the added effect of feeling pleasure from the relief of that stress. It's similar to when with a parched throat you drink some cool water: the pleasure effect is much heightened by the relief of thirst.”

Even a relatively “mild” stressor such as maternal depression—let alone neglect, abandonment or abuse—can disturb an infant’s physical stress mechanisms. Add neglect, abandonment or abuse, and the child will be more reactive to stress throughout their life. A study published in The Journal of the American Medical Association concluded that “a history of childhood abuse per se is related to increased neuroendocrine [nervous and hormonal] stress reactivity, which is further enhanced when additional trauma is experienced in adulthood.”



## **A child who experiences neglect, abandonment or abuse will be more reactive to stress throughout their life.**

A brain pre-set to be easily triggered into a stress response is likely to assign a high value to substances, activities and situations that provide short-term relief. It will have less interest in long-term consequences, just as people in extremes of thirst will greedily consume water that may contain toxins. On the other hand, situations or activities that for the average person are likely to bring satisfaction are undervalued because, in the addict's life, they have not been rewarding—for example, intimate connections with family. This shrinking from normal experience is also an outcome of early trauma and stress.

Hardcore drug addicts, whose lives invariably began under conditions of severe stress, are all too readily triggered into a stress reaction. Not only does the stress response easily overwhelm the addict's already challenged capacity for rational thought when emotionally aroused, but also the hormones of stress “cross-sensitize” with addictive substances. The more one is present, the more the other is craved. Addiction is a deeply ingrained response to stress, an attempt to cope

with it through self-soothing. Maladaptive in the long term, it is highly effective in the short term.

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Predictably, stress is a major cause of continued drug dependence. It increases opiate craving and use, enhances the reward efficacy of drugs and provokes relapse to drug-seeking and drug-taking.

“Exposure to stress is the most powerful and reliable experimental manipulation used to induce reinstatement of alcohol or drug use,” one team of researchers reports. “Stressful experiences,” another research group points out, “increase the vulnerability of the individual to either develop drug self-administration or relapse.”

**Stress is a major cause of continued drug dependence.**

Stress also diminishes the activity of dopamine receptors in the emotional circuits of the forebrain, particularly in the Nucleus

Accumbens, where the craving for drugs increases as dopamine function decreases. The research literature has identified three factors that universally lead to stress for human beings: uncertainty, lack of information and loss of control. To these we may add conflict that the organism is unable to handle and isolation from emotionally supportive relationships. Animal studies have demonstrated that isolation leads to changes in brain receptors, and increased propensity for drug use in infant animals and in adults reduces the activity of dopamine-dependent nerve cells. Unlike rats reared in isolation, rats housed together in stable social groupings resisted cocaine self-administration.

Human children do not have to be reared in physical isolation to suffer deprivation: emotional isolation will have the same effect, as does stress on the parent. Stress on pregnant mothers has a negative impact on dopamine activity in the brain of the unborn infant, an impact that can last well past birth.

**Stress on pregnant mothers has a negative impact on the brain of the unborn infant, an impact that can last well past birth.**

Some people may think that addicts invent or exaggerate their sad stories to earn sympathy or to excuse their habits. In my experience, the opposite is the case. As a rule, they tell their life histories reluctantly, only when asked and only after trust has been established—a process that may take months, even years. Often they see no link between childhood experiences and their self-harming habits. If they speak of the connection, they do so in a distanced manner that still insulates them against the full emotional impact of what happened.

Research shows that the vast majority of physical and sexual assault victims do not spontaneously reveal their histories to their doctors or therapists. If anything, there is a tendency to forget or to deny pain. One study followed up on young girls who had been treated in an emergency ward for proven sexual abuse. When contacted seventeen years later as adult women, 40 per cent of these abuse victims either did not recall or denied the event outright. Yet their memory was found to be intact for other incidents in their lives.

Addicts who do remember often blame themselves. "I was hit a lot," says a former patient, forty-year-old Wayne, "but I asked for it. Then I made some stupid decisions." And would he hit a child, I inquire, no matter how much that child "asked for it"? Would he blame that child for "stupid decisions"? Wayne looks away. "I don't want to talk about

that crap," says this tough man, who has worked on oil rigs and construction sites and served fifteen years in jail for armed robbery. He looks away and wipes his eyes.

Grasping the powerful impact of the environment, early childhood experience, parental attachment, trauma and stress on brain development may leave us feeling hopelessly gloomy about recovery from addiction. But there are solid reasons not to despair. Our brains can also be resilient organs: some important circuits continue to develop throughout our entire lives, and they may do so even in the case of a hardcore drug addict whose brain “never had a chance” in childhood. That’s the good news, on the physical level.

Even more encouraging, we have something in or about us that transcends the firing and wiring of neurons and the actions of chemicals. The mind may reside mostly in the brain, but as we’ve seen, it is much more than the sum total of the automatic neurological programs rooted in our pasts. And there is something else in us and about us: it is called by many names, “spirit” being the most democratic and least denominational or divisive in a religious sense.

**We have something in or about us that transcends the firing and wiring of neurons and the actions of chemicals. It's our spirit.**

## **WHAT'S NEXT?**

Learn more about addiction and Dr. Maté's approach to health and well-being on his website [here](#).

For more info on the material and studies referenced in this guide, or to purchase the book, see [In the Realm of Hungry Ghosts](#).

And connect with us on Facebook [here](#).