The Science of Stress #1

Stress might be one of the things you want to avoid the most. Humans have _____ _____ _____ and _____, but haven't _____ _____ _____ _____ stress. Why are we designed to experience stress? What _____ is stress? _____ simply, stress is a _____ response system designed to maximize the _____ of _____ and reproduction. We live in an agriculture-_____, _____ society of the 21st Century, _____ ____ still have the body and mind _____ for the hunter-gatherer lifestyle of our ancestors. We feel stress _____ what _____ our ancestors' lives and _____ opportunities, and that stress _____ ____ to _____ or _____ _____ threats. The problem is that the living environment in the 21st Century is quite _____ _____ our ancestors. The _____ mechanism that _____ our ancestors survive often backfires today, _____ ___ makes us _____ _____, _____, and unhappy. Besides, ____ _____ _____ optimized for survival and reproduction, not for our well-being. To live happily, we need to fully understand _____ _____ operating system and _____ how to _____ ____. How can we _____ _____ _____ our stress system?

Stress might be one of the things you want to avoid the most. Humans have achieved unprecedented wealth and security, but haven't yet been freed from stress. Why are we designed to experience stress? What exactly is stress? Put simply, stress is a threat response system designed to maximize the probability of survival and reproduction. We live in an agriculture-based, industrialized society of the 21st Century, but we still have the body and mind fit for the hunter-gatherer lifestyle of our ancestors. We feel stress against what threatened our ancestors' lives and reproductive opportunities, and that stress prompts us to confront or avoid these threats. The problem is that the living environment in the 21st Century is quite different from our ancestors. The very mechanism that helped our ancestors survive often backfires today, and it makes us stressed out, depressed, and unhappy. Besides, it has been optimized for survival and reproduction, not for our well-being. To live happily, we need to fully understand our internal operating system and learn how to manage it. How can we get along with our stress system?

unprecedented	前例のない		ancestor	祖先
wealth	富		confront	立ち向かう
threat	脅威		backfire	裏目に出る
reproduction	繁殖		depressed	落ち込んだ
industrialized	工業化された		manage	管理する

The Science of Stress #2

Stress is a biological system to avoid potential threats and _____ ____ _____ dangers for survival. Our biological nature was _____ ____ the hunter-gatherer era, _____ half of the population died before reaching _____. ____ _____ ____ survive such a harsh environment, our stress system has _____ to respond to potential _____ _____ sensitively. Imagine a situation _____ _____ _____ hunter gatherer is walking through a forest. _____, a poisonous snake _____ _____ the grass. Then, his brain _____ sends a signal to release stress hormones like cortisol, _____ his body to send more energy and oxygen to his _____ and brain. But the more effective survival strategy is to get ready for the threat even _____ ___ _____. When the grass _____, it could be caused by a _____ _____, a _____ _____, or a venomous snake. If the top priority is survival, his biological _____ has to _____ that the sound is made by a snake, ___ _____ how _____ ____ ____. The body shows a similar stress response to an actual snake and an imaginary snake you _____ ___ _____. In most cases, it's a _____ _____, but the cost is small; _____ discomfort of stress _____ _____ throughout the body. The price is far cheaper than losing your life. _____ survival is the primary _____ for evolution, the stress response system should be _____ _____. Today, the brain sometimes _____ negative outcomes _____ any _____ reason, because ____ ____ _____ to do so.

Stress is a biological system to avoid potential threats and deal with imminent dangers for survival. Our biological nature was shaped in the hunter-gatherer era, where half of the population died before reaching adulthood. In order to survive such a harsh environment, our stress system has evolved to respond to potential threats overly sensitively. Imagine a situation where our ancestral hunter gatherer is walking through a forest. Suddenly, a poisonous snake appears from the grass. Then, his brain immediately sends a signal to release stress hormones like cortisol, directing his body to send more energy and oxygen to his muscles and brain. But the more effective survival strategy is to get ready for the threat even before it appears. When the grass rustles, it could be caused by a fallen twig, a harmless rabbit, or a venomous snake. If the top priority is survival, his biological algorithm has to assume that the sound is made by a snake, no matter how unlikely it is. The body shows a similar stress response to an actual snake and an imaginary snake you predict to encounter. In most cases, it's a false alarm, but the cost is small; temporary discomfort of stress hormones circulating throughout the body. The price is far cheaper than losing your life. Since survival is the primary concern for evolution, the stress response system should be somewhat overactive. Today, the brain sometimes predicts negative outcomes without any substantial reason, because it is designed to do so.

biological	生物学的な		circulating	循環している
imminent	差し迫った		primary	主な
adulthood	成人期		predict	予測する
cortisol	コルチゾール		outcome	結果
venomous	毒を持つ		substantial	かなりの
algorithm	アルゴリズム		ancestral	祖先の
temporary	一時的な		sensitive	敏感な
discomfort	不快感			

The Science of Stress #3

One way to survive a life-threatening situation is to _____ ___ and _____ _____ ___. For example, when we see a poisonous snake, various stress hormones immediately _____ through the bloodstreams, encouraging our body to _____ ____ _____ ___ _____. However, if the world is full of too many dangers, the best survival strategy is not to _____ _____ the outside world ____ _____ _____. When we are _____ to _____ and chronic _____ for a long time, our instinct _____ ___ as a sign that there are _____ threats in the outside world. In order to _____ _____ _____ these risks, the brain tries to keep us indoors by making us _____ _____. This is supposed to be the mechanism behind the _____ of mental disorders, such as depression. Also, our instinct does not understand the _____ information and transportation technologies. Natural disasters _____ _____ ____ distant countries will not directly _____ your life. However, our biological instinct was _____ in a hunter-gatherer era _____ _____ _____ ____ _____ things as the _____ and TVs. Therefore, _____ very recently in human history, we _____ _____ a chance to see and _____ about tragedies that _____ people in distant areas. We consciously know that they are happening at distant places, _____ _____ _____ may believe that we are surrounded by _____ _____. Of course, it is important to _____ _____ _____ what's happening around the world, but maintaining your _____ _____ peace is _____ or more _____. If watching the news is depressing, you don't have to.

One way to survive a life-threatening situation is to face it and get over it. For example, when we see a poisonous snake, various stress hormones immediately circulate through the bloodstreams, encouraging our body to prepare for fight or flight. However, if the world is full of too many dangers, the best survival strategy is not to walk around the outside world to begin with. When we are exposed to intense and chronic stressors for a long time, our instinct interprets it as a sign that there are numerous threats in the outside world. In order to stay away from these risks, the brain tries to keep us indoors by making us feel depressed. This is supposed to be the mechanism behind the development of mental disorders, such as depression. Also, our instinct does not understand the latest information and transportation technologies. Natural disasters and wars in distant countries will not directly threaten your life. However, our biological instinct was shaped in a hunter-gatherer era where there were not such things as the Internet and TVs. Therefore, until very recently in human history, we didn't have a chance to see and learn about tragedies that struck people in distant areas. We consciously know that they are happening at distant places, but our subconscious may believe that we are surrounded by imminent threats. Of course, it is important to stay informed about what's happening around the world, but maintaining your own inner peace is equally or more important. If watching the news is depressing, you don't have to.

life-threatening	命にかかわる		instinct	本能
circulate	循環する		subconscious	潜在意識
bloodstream	血流		transportation	交通
instinct	本能		disaster	災害
intense	強烈な		tragedy	悲劇
chronic	慢性的な		inner peace	内なる平和
depression	鬱病		depressing	落ち込ませるような

The Science of Stress #4

Humans are exceptionally social animals. In the natural environment, a single individual human is _____ _____, so we have _____ and _____ by _____ together and cooperating with each other. _____, the body and the mind of Homo sapiens ____ _____ to have _____ _____ _____ _____ ___ _____ social condition and status; we are designed to be afraid of social isolation and _____ _____ _____ _____ relative social standing in the community. These two concerns can be _____ sources of stress. For example, ____ your boss ____ _____ says, 'I need to talk to you about something,' you might feel a _____ _____. Your boss could just want to talk over a complicated topic that is difficult to be discussed _____ email, but your brain worries that you are going to _____ negative feedback. _____ ___ ____ _____ is the _____ of being _____ or losing status. In addition, our instinct for social status particularly backfires today. If you were in a group of 150 hunter-gatherers, you could be _____ _____ ____ yourself, saying “I’m relatively beautiful in this community,” or “I’m _____ _____.” Today, by contrast, we can see the lives of the top _____ and perfect but _____ days of influencers on social media. We are being _____ _____ _____ _____ always people _____ _____ us in the 8-billion population. By comparing ourselves to those perfect _____ _____ _____, the brain interprets _____ _____ _____ _____ is going down, which possibly _____ our mental health. Our instinct doesn’t understand the fact that the celebrity _____ _____ smartphone’s screen is a _____ _____, almost _____ to meet, and _____ has nothing to do with our lives. Today, the stress response system often _____ _____ to the _____ and minor signs of social threats.

Humans are exceptionally social animals. In the natural environment, a single individual human is embarrassingly helpless, so we have survived and thrived by gathering together and cooperating with each other. Thus, the body and the mind of Homo sapiens have evolved to have extra care about his or her social condition and status; we are designed to be afraid of social isolation and constantly care about our relative social standing in the community. These two concerns can be chronic sources of stress. For example, if your boss at work says, 'I need to talk to you about something,' you might feel a bit anxious. Your boss could just want to talk over a complicated topic that is difficult to be discussed via email, but your brain worries that you are going to receive negative feedback. What is at play is the fear of being expelled or losing status. In addition, our instinct for social status particularly backfires today. If you were in a group of 150 hunter-gatherers, you could be quite content with yourself, saying “I’m relatively beautiful in this community,” or “I’m pretty capable.” Today, by contrast, we can see the lives of the top celebrities and perfect but illusional days of influencers on social media. We are being told that there are always people greater than us in the 8-billion population. By comparing ourselves to those perfect yet delusive images, the brain interprets that our relative status is going down, which possibly undermines our mental health. Our instinct doesn’t understand the fact that the celebrity on our smartphone’s screen is a complete stranger, almost unlikely to meet, and therefore has nothing to do with our lives. Today, the stress response system often reacts excessively to the subtle and minor signs of social threats.

exceptionally	並外れて、例外的に		anxious	不安な
helpless	無力な		expelled	追放された
thrived	繁栄した		capable	有能な
cooperating	協力する		delusive	妄想的な
social condition	社会的状況		undermine	損なう
social isolation	社会的孤立		excessively	過度に

The Science of Stress #5

In short, stress is the result of the _____ _____ system designed specifically for survival. Since survival is the _____ _____, it is designed to be _____ ____ _____. Therefore, it is unrealistic to _____ how to _____ and _____ all kinds of stress. Rather, we need to understand what stress is and know how to better _____ _____ ____. First, stress is just a _____ _____. Let's say you have an _____ _____ _____ _____ and feel anxious about the relationship. You will feel uncomfortable, not directly because of the argument itself, but because of the _____ _____, such as _____ _____ and _____ stress hormones in your bloodstream. If the _____ persists and _____ you _____ work, you can let it go by changing your physiological state, such as exercising, taking a shower or a sauna, or attending a live _____. Exercising is particularly effective. Physical exercise itself is also a stressful experience, but, unlike psychological stress, it is _____ comfortable. When you start running, cortisol, one of the major stress hormones, increases in your bloodstream. After working out, the body _____ to _____ the _____ stress levels back to normal, which usually leads to lower _____ levels than before exercise. We often find ourselves cheerful and refreshed _____ exercising _____ because of these hormonal changes. In other words, you can _____ psychological stress with physical stress; washing away uncomfortable stress with healthy, comfortable stress. Moreover, after several weeks of regular exercise, your ordinary stress responses will become more _____. Another effective intervention is changing how you _____ stress. By _____ _____ _____ to positive aspects of a stressful experience, you can change how your body responds to stress. _____, our biological mechanism is not designed to _____ ____ happy all the time. ____ _____ ____ stay happy, we need to understand _____ _____ _____ and how to deal with it.

In short, stress is the result of the threat response system designed specifically for survival. Since survival is the primary concern, it is designed to be overactive by default. Therefore, it is unrealistic to ponder how to avoid and eliminate all kinds of stress. Rather, we need to understand what stress is and know how to better cope with it. First, stress is just a physiological phenomenon. Let's say you have an argument with your partner and feel anxious about the relationship. You will feel uncomfortable, not directly because of the argument itself, but because of the physiological alterations, such as parasympathetic inhibition and increased stress hormones in your bloodstream. If the anxiety persists and distracts you from work, you can let it go by changing your physiological state, such as exercising, taking a shower or a sauna, or attending a live concert. Exercising is particularly effective. Physical exercise itself is also a stressful experience, but, unlike psychological stress, it is somewhat comfortable. When you start running, cortisol, one of the major stress hormones, increases in your bloodstream. After working out, the body tries to restore the elevated stress levels back to normal, which usually leads to lower cortisol levels than before exercise. We often find ourselves cheerful and refreshed after exercising primarily because of these hormonal changes. In other words, you can overwrite psychological stress with physical stress; washing away uncomfortable stress with healthy, comfortable stress. Moreover, after several weeks of regular exercise, your ordinary stress responses will become more moderate. Another effective intervention is changing how you interpret stress. By turning your eyes to positive aspects of a stressful experience, you can change how your body responds to stress. Again, our biological mechanism is not designed to keep us happy all the time. In order to stay happy, we need to understand our internal algorithm and how to deal with it.

physiological	生理的な		distract	注意をそらす
phenomenon	現象		intervention	介入
alteration	変化		moderate	適度な
inhibition	抑制		interpret	解釈する
persist	持続する			