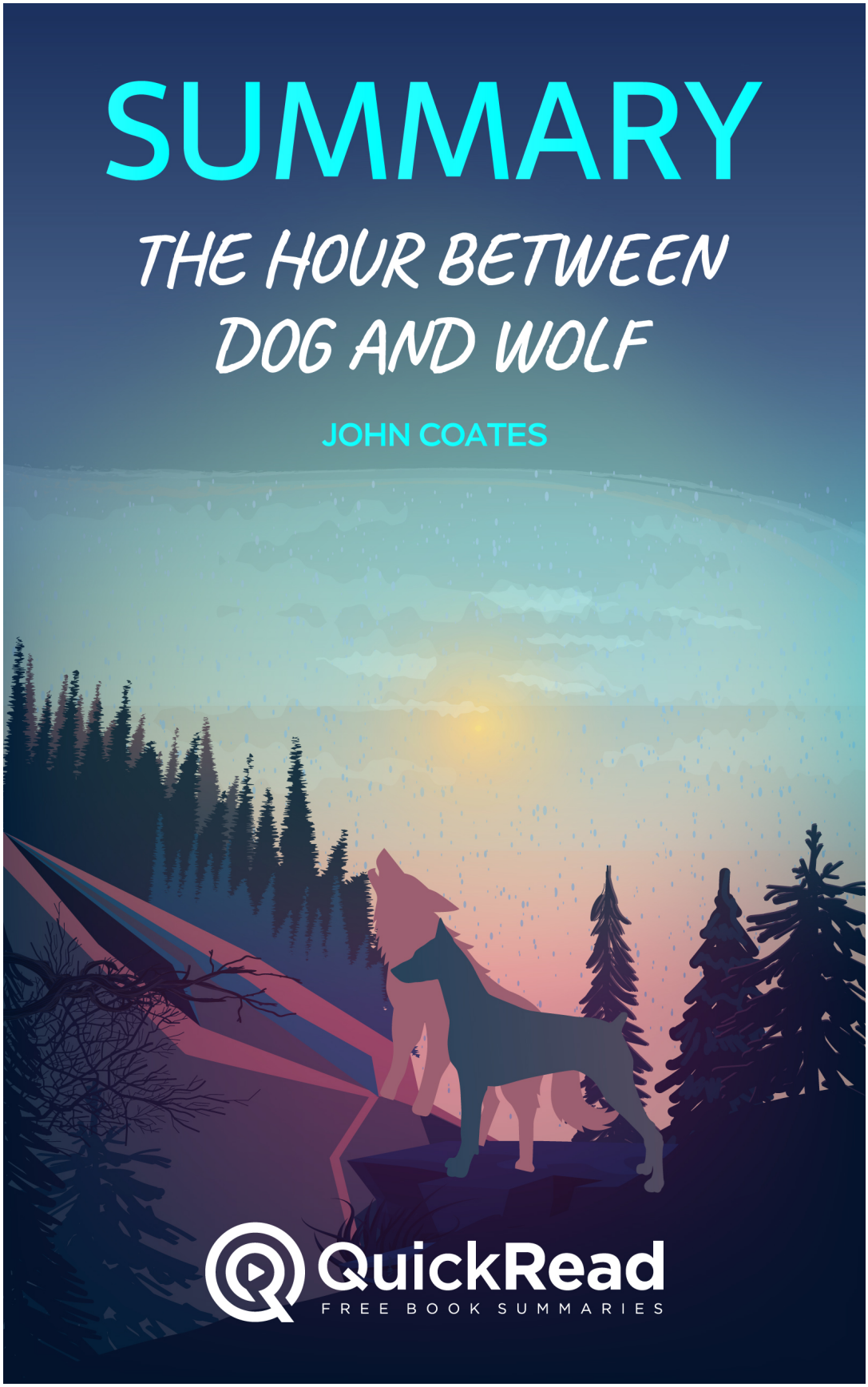
SUMMARY

THE HOUR BETWEEN DOG AND WOLF

JOHN COATES



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Summary of “The Hour Between Dog and Wolf” by John Coates

Written by Lea Schullery

How Risk Taking Transforms Us, Body and Mind.

Introduction

Where do you find your thrills? Perhaps you enjoy speeding along a winding road, surfing a monster wave as it crests over a coral reef, or climbing mountains despite an approaching blizzard. In each of these, people face a high chance of injury, even death. When we risk death, our body changes, our mind sharpens and we go into a biological reaction known as the "fight-or-flight" response. However, our body can be thrown into this response even when death poses no immediate threat. Take someone who plays a sport who understands "it's just a game," yet risks injury to play his or her best. These similar emotions and biological reactions can be triggered by many forms of non-lethal risks, like financial risk-taking. Professional traders, asset managers, and individuals investors from home don't necessarily face death, yet the bets they place can threaten their job, house, marriage, reputation, and social class. In other words, money is incredibly powerful in our lives.

When it comes to playing the markets, something happens to our minds and bodies. As the potential for profit looms in your imagination, you begin to feel an unmistakable surge of energy as steroid hormones begin to turbo-charge. Once the hormones kick in, they begin to change just about every detail of your body, including your metabolism, growth rate, mood, cognitive performance, even your memories. Testosterone rises, increases the hemoglobin and the blood's capacity to carry oxygen; testosterone also increases your state of confidence and, crucially, your appetite for risk. This is the moment of transformation, what the French since the Middle Ages have called "the hour between dog and wolf." This is the "Jekyll and Hyde" transformation that many traders undergo when under immense pressure. In this phase, they become overly confident and are more prone to taking risks. Throughout *The Hour Between Dog and Wolf,* John Coates demonstrates how our bodies produce gut feelings, how stress impairs our judgment and damages our health, and how sports science can help us toughen our bodies against stress.

The Bull-Market Molecule

It was during the rising dot.com era that John Coates noticed a behavioral change in the young, professional traders of Wall Street. Normally sober and prudent, these traders were becoming more euphoric and delusional. Their minds were frequently racing, their habits were changing as they did more on less sleep, and their sexual drive was heightened more than usual. The most troubling, however, was that they were becoming overconfident in their risk-taking, placing increasingly large bets with heavier risks.

This manic behavior is not unique to Wall Street, Coates himself has behaved similarly in the past since he became caught up in one or two bull markets. During those years, he too enjoyed above-average profits, felt euphoria and a sense of omnipotence, and became cocky. So during the dot.com bubble, he knew what they were going through. At this point, he understood that the overconfidence and hubris the traders were experiencing weren't driven by a rational assessment of opportunities, nor by greed - it was driven by a chemical.

But what chemical? Psychiatrist Randolph Neese suspected that the brains of traders and investors were different, as they were largely under the influence of antidepressant drugs like Prozac. Others suspected the culprit was the increasing use of cocaine among bankers. While both of these theories didn't go incredibly far, Coates knew that they were on the right track. There was certainly a chemical causing such manic behavior. But what was the bull-market molecule causing it?

Well, it may, in fact, be a hormone. Hormones are chemical messengers carried by the blood from one tissue in the body to another. We have dozens of them. Some hormones stimulate hunger, others tell us we are sated. They play a central role in our body's homeostasis, including the maintenance of vital signs, like blood pressure, body temperature, glucose levels, etc. In other words, our bodies are intricate mechanisms designed to

spring us into action based on our bodies' needs, and our thoughts and actions are influenced by hormones.

For example, Ghrelin is a hormone produced by cells in the lining of the stomach. They let your brain know that you are hungry and urge you to eat. But your brain doesn't necessarily have to comply. If you're on a diet or a religious fast, you can choose to ignore the message. Of course, this only works temporarily. Over time, the hormone acts as a lobby group, recommending and pressuring you further into eating. The message that may have been a whisper at first is now a foghorn becoming harder to ignore. As you can see, the body and the brain work together to help you make decisions. This can be further seen by looking at the gut and the brain as well.

For example, when we are stressed, the brain in our head informs the brain in our gut of an impending threat and advises it to stop digesting to save up energy. In other words, the brain and the gut send messages back and forth, and stress is processed by both the body and brain. Information may also flow the other way, with events in the gut causing changes in the brain. For example, people suffering from Crohn's disease, an inflammatory bowel disease, are more easily affected by emotional stimuli. Ultimately, our brains and bodies work together when we make decisions, and even when we take risks.

The Winner Effect

When it comes to hormones, there is one group of hormones that have particularly powerful effects on our behavior: steroid hormones. Steroid hormones include testosterone, estrogen, and cortisol, the main hormone of the stress response. Today, we understand that these steroids exert widespread effects on our bodies because they have receptors in almost every cell in our body and brain.

It's during moments of risk-taking, competition, and triumph that one steroid becomes more powerful than the rest: testosterone. Imagine two males entering a fight. In anticipation of that competition, their bodies would experience a surge in testosterone, increasing their blood's capacity to carry oxygen and, in time, their lean muscle mass. Additionally, testosterone affects the brain, increasing confidence, and their appetite for risk. Once the battle is over, the winner emerges with even higher levels of testosterone, the loser with lower levels. The winner then proceeds to the next round of the competition with elevated levels of testosterone. This priming gives him an edge, helping him win yet again.

This is what scientists call "the Winner Effect." Scientists have replicated experiments testing the winner effect and have found that, at some point, these elevated steroids can begin to have the opposite effect on success and survival. Those who experience this upward spiral of testosterone and victory are more likely to take risks and engage in reckless behavior. As a result, they are more likely to die young as they start fights they can't finish. It is these high testosterone levels that have the power to transform people. The French call it "the hour between dog and wolf," meaning the hour where the light is dim and can't yet decipher if we are safe or in danger.

Is this upward surge of testosterone responsible for the risky behavior that occurs in the financial markets? The winner effect could be an explanation for why young male traders were more likely to take risks during the dot.com bubble. Coates became further convinced of the effects of

testosterone when patients with cancer were given testosterone to help them put on weight. Andrew Sullivan then wrote about the effects of these injections, stating, “I can actually feel its power on almost a daily basis. Within hours, and at most a day, I feel a deep surge of energy. It is less edgy than a double espresso but just as powerful… My wit is quicker, my mind faster, but my judgment more impulsive… In a word, I feel braced. For what? It scarcely seems to matter.” Sullivan was simply describing what it feels like to be a trader on a roll.

Our Consciousness Acts as a Bystander

Have you ever thought about the speed of our physical reactions? Why is it that when driving at 70 miles an hour, we have as little as 370 milliseconds to avoid a car 75 feet in front of us and succeed? How can an athlete react to fast-moving objects like ice hockey pucks, baseballs, and tennis balls? Well, the answer lies in our brains.

You see, our visual system is surprisingly slow. When light hits our retina, the photons must be translated into a chemical signal, and then into an electrical signal that can be carried along nerve fibers. The electrical signal must then travel to the very back of the brain to an area called the visual cortex. It then must project forward again along two separate pathways, one processing the identity of the objects we see, called the "what stream." The "where" stream then allows us to process the location and motion of the objects. This entire process takes a surprisingly long time, approximately 100 milliseconds. So while we think we survey events in "real-time," the truth is, that by the time we see something, the world has already moved on.

This phenomenon was then demonstrated through an experiment investigating what is called the "flash-lag effect." In this experiment, a person is shown a blue circle with a yellow circle inside of it. The yellow circle flashes on and off, so the participant sees the blue circle with a yellow circle blinking inside it. Then, the blue circle with the yellow one inside starts to move around the computer screen. The observer, however, doesn't see a blue and yellow circle traveling across the screen; instead, he sees a moving blue circle with a yellow one lagging behind. But why? While the blue circle is moving, your brain can anticipate its location. But the yellow circle, blinking on and off, cannot be anticipated, so it is not advanced. Therefore, it appears to be left behind by the fast-forwarded blue circle.

Furthermore, our reaction times prove that we are mostly on autopilot. In the 1970s, Benjamin Libet, a physiologist at the University of California,

conducted an experiment in which he measured the electrical activity in the brains of participants while instructing them to lift one of their fingers. He found that the participants' brains were preparing for the action 300 milliseconds before they decided to lift their finger. Their conscious decision to move came almost one-third of a second after their brain initiated the movement. In other words, these experiments suggested that our consciousness is merely a bystander observing a decision already taken, almost like watching ourselves on video.

Intuition is Paired With Physical Reactions

While many people believe they have control over their thoughts, many scientists have proven that most of our thinking takes place automatically. Essentially, our thinking simply hums along behind the scenes, quietly, efficiently, and rapidly. To illustrate how automatic thinking works, one experiment conducted by Pawel Lewicki asked participants to predict the location on a computer screen of a cross that would appear and disappear randomly.

Little did the participants know that the location of the cross followed a rule, so its location could be predicted. Even though they couldn't explain the rule, the participants got better at predicting the location of the cross. In other words, they were learning the rule pre-consciously, showing that many of the mental processes we assume are conscious take place below the surface of awareness. Traders rely on this pre-conscious process to make high-risk decisions, but can we trust these gut feelings? To answer this question, we must take a look at what intuition really is. According to psychologists Daniel Kahneman and Gary Klein, intuition is the recognition of patterns.

For instance, chess grandmasters are said to store up to 10,000 board configurations when they access for clues on what to do next. Therefore, intuition is nothing more mysterious than recognition. This pattern recognition, however, is critical on trading floors where traders must predict which direction the market is going to go. But is this even possible? According to the Efficient Market Hypothesis, the market moves when new information arrives, and since news cannot be predicted, neither can the market. Investors and economists who argue this hypothesis believe no one can predict the market, nor consistently outperform it.

But Yale economist Robert Shiller doesn't buy into this hypothesis. According to Shiller, investing is like any other profession, meaning that given enough intelligence, education, training, and hard work, your

performance can improve. To prove this theory, we can look at the Sharpe Ratio of experienced traders versus inexperienced ones. The Sharpe Ratio simply measures a trader's success in the stock market. When examining Sharpe Ratio, experienced traders had 2.5 times higher success rates than less-experienced traders. According to these numbers, predicting the stock market is a learnable skill.

Traders still can't quite explain where their success comes from because they rely on their intuition to help them make predictions. Our intuition is influenced by our physical reactions or Somatic Markers. According to the Somatic Marker Hypothesis, each event we store in memory comes bookmarked with bodily sensations. These bodily sensations are the somatic markers that we felt at the time of living through the experience for the first time. We then use these somatic markers to help us decide what to do when we find ourselves in a similar situation.

As we scroll through our options, each decision may be accompanied by a physical response, like a subtle tensing of the muscles, a quickening of breath, a slight shiver of dread, a brief moment of calm, or a frisson of excitement until one simply feels right. These bookmarks are critical in high-risk situations that can hurt us both physically and financially. Traders rely on these bookmarks and use these hunches and gut feelings to intuitively make successful trades.

Successful Traders are Physically Fit

If you walk around the trading floors of Wall Street, you'll find that many traders have one thing in common: they are relatively fit people. Many young fit males and former athletes find a career in the stock market, but why is this? Well, to be successful in the stock market, you must have both physical and mental stamina and agility. For instance, being a trader means having to scan screens for long periods, and trying to spot price anomalies faster than their competitors. They then must be able to react quickly to get the greatest return on their investment. This requires a great deal of concentration, and the more physically fit you are, the longer you can concentrate, and the quicker you can react.

If you look at athletes, you'll notice that they are very in tune with their bodies. They know the ins and outs of how they are feeling and can quickly recognize when something is not quite right. This is because physical fitness allows them to become more aware of their bodies. Traders can benefit from this as well; in fact, when they are physically fit, they become better at interpreting the Somatic Markers, which allows them to more accurately rely on their gut feelings and hunches. In one study, scientists found that sensitivity to somatic markers can be measured by a test that measures "heartbeat awareness."

In this test, participants were asked to time their heartbeats, or identify the repetitive tone. They found that heartbeat awareness is lower in people who are overweight, almost as if their signals are being impeded. Physically fit people, however, had a higher heartbeat awareness. Could this research then be used as a recruitment tool for businesses? Some have suggested that monitoring and recording a traders' heart rate, pulse, respiratory cycle, and so on could help monitor a traders' gut feelings while taking risks. A study published in the magazine *The Economist* found that when morning levels of testosterone in male traders were higher than average, they made an above-average profit that day.

Perhaps, managers should test their traders first thing in the morning, and if their biochemistry isn't quite right, they should be sent home. While this may seem a bit far-fetched, this practice is common in the world of sports. Sport scientists monitor their athletes' physiology, constantly searching for signs that indicate whether or not they are ready for an upcoming competition. Physiological monitoring in traders could perhaps help managers tell whether or not traders are sound of mind or caught up in the irrational exuberance of a bull market. If this type of monitoring is useful and popular among Olympic athletes and the military, it should come as no surprise that this monitoring might one day make its way onto the trading floor.

The Harmful Effects of Too Much Cortisol

When traders experience a stock market crash or a bear market, their body responds by flooding with cortisol. In small doses, cortisol can energize us and help us escape a dangerous or threatening situation. But as it becomes released in such large quantities, it begins to alter the character of the stress response, causing the body and brain to "hunker down for a long siege." At this point, the effects become unpleasant, and any attempts to remain calm and cool will become the equivalent of "a student trying to finish an exam in the middle of a fire drill."

The adrenal glands pour cortisol throughout the body, carrying a message to every area of the body, and delaying the fight-or-flight response. Therefore, the body needs to maintain energy for the marathon struggle it is about to encounter. As cortisol takes over, the heart rate accelerates and diverts energy away from digestion, reproduction, growth, and energy storage. Furthermore, cortisol begins to affect concentration, a problem stemming from the region in the brain called the locus ceruleus. Under a heavy load of stress, the pattern of neural firing in the locus ceruleus changes from short and frequent bursts to sustained firing.

As a result, we become panicky and too stressed to think clearly. Our attention jumps from one thing to the next, affecting a traders' ability to make profitable trades. This prolonged exposure to cortisol then begins to wreak havoc on the cardiovascular and immune system, further impairing the ability to assess risk. Essentially, a trader becomes almost useless when experiencing high amounts of stress and cortisol. The stress hormone further affects memory by acting on dense receptor fields in the amygdala and the hippocampus. These two brain regions work together in remembering stressful events. In other words, high levels of cortisol cause traders to remember their past mistakes and bad trades, lowering their testosterone and making them less prone to take risks.

Lastly, these crises cause traders to feel vulnerable, leading to bullying and more violent behavior. For instance, desk managers begin bullying juniors and firing people before the bank even announces layoffs. According to Robert Sapolsky, dominant monkeys who become exposed to uncontrollable stressors begin to bite subordinates; similarly, managers offload their cortisol onto juniors, even those who are performing well.

Nature and Nurture Affects Our Physiological Toughness

So while cortisol is engineered to help us carry out life-saving actions, like fleeing a fire, chronic stress can become dangerous over time - leading to hypertension, heart disease, type 2 diabetes, immune disorders, and depression. So can we control cortisol, or turn it off? While we may not be able to shut it off, we can certainly “toughen up.” While our physiological toughness is partly due to nature, nurture can still play an important role in how we handle stress later in life.

For example, young rats that are handled by humans will develop larger adrenal glands, and as adults will show a more muted stress response to threats. Even more so, these rats tend to live longer, and one study found stressed rats had a life expectancy 18% longer than non-stressed rats. The key, however, is that stress must be moderate. Rats that experienced more traumatic stress, like maternal separation, became more anxious and ill-prepared to handle life’s stressful events. These studies show that candidates who have experienced moderate stress in the past might be better traders because they are likely to handle their stress better.

Furthermore, training or toughening effects of acute stress can be observed in adult rats. These stressors include being handled by humans, running on an exercise wheel, mild shock, and more. Researchers found that no matter the stressor, the response was the same. After repetition, however, the rats began to toughen up. This simply means that by repeatedly exposing yourself to mild stress, you can begin to toughen up and become less affected by it. For humans, one of the best toughening regimens is physical exercise. Exercise expands the productive capacity of our amine-producing cells, which helps us become immune to anxiety, stress, depression, and learned helplessness.

Exercise in colder climates has a particularly powerful effect. For instance, scientists found that rats swimming regularly in cold water develop the

capacity to make quick and powerful arousals, relying on adrenalin more than cortisol, and can switch it off just as quickly. This suggests that people who are regularly exposed to cold weather or who swim in cool water may be unknowingly undergoing an effective toughening regimen, making them more emotionally stable when confronted with prolonged stress.

Stabilize the Stock Market By Diversifying Trading Floors

It's no secret that the trading floors are largely populated by young men. As a result, testosterone levels are incredibly high and behavior becomes more volatile in response to the hormone's effects. So if a bull market is only amplified by the testosterone feedback loop among traders and investors, can we reduce this instability by employing more women and older men?

Well, let's first consider older men. Hormones change throughout a man's life, and testosterone slowly declines after their mid-twenties. That decline accelerates after the age of fifty. At the same time, cortisol levels drift upwards. As men age, they become less susceptible to testosterone feedback loops that can morph into risky behavior. Furthermore, older men bring valuable experiences. They have lived through the crash of '87 or the Savings & Loan crisis of the late 1980s and early 90s when hundreds of US banks became insolvent. Therefore, they are less likely to take risks without thinking about the wide range of possible outcomes.

Unfortunately, trading floors are traditionally hostile towards older traders. Their slower reaction times and their cautious attitudes are often misinterpreted as fear. But there is little evidence to suggest that age impairs judgment. In fact, many legendary investors like Warren Buffet and Benjamin Graham achieved their status much later in life, not as young men.

Currently, women only make up 5% of the trading floor's population, but there are many benefits to having women in the business as well. For instance, women have different biologies than men. They produce, on average, about 10-20% of the amount of testosterone as men, which means they are less prone to the Winner Effect that many young men experience. Additionally, women's stress response differs substantially from men's. Psychologist Shelley Taylor believes that while a woman will certainly experience a fight-or-flight reaction if faced with a grizzly bear, a woman's

reaction within social situations is what she calls a “tend-and-befriend” reaction. In other words, women are more likely to tend-and-befriend someone before launching into an all-out fist-fight or running away.

Lastly, women typically have the same levels of cortisol as men, and they can be equally volatile. But research has found that women are not stressed by failures in competitive situations like men are. Instead, they are more stressed by social problems, like family and relationships. Women being less hormonally reactive than men to making and losing money means that their calmness could help dampen the volatility we currently find in the financial world.

Combat Stress By Taking Back Control

Beyond the individual toughening regimens, there are some other changes we can make in our lives to reduce stress in the workplace. You see, novelty, uncertainty, and uncontrollability seem to worsen our stress, and these factors are endemic to the markets themselves. Over time, this chronic stress affects our health, risk-aversion, and financial market instability. So what can we do to alleviate these pathological conditions?

The Whitehall Studies looked at the health consequences of job insecurity and uncontrollability in the British civil service. They found that uncertainty among employees led to an increase in hypertension, cholesterol levels, and heart disease. Reducing that uncertainty and giving people even a small amount of control can have noticeable healing effects. For instance, doctors found that patients experiencing pain suffered more when they didn't know when they would get their next round of pain medication. However, for those who could administer the painkillers themselves, the amount used dropped.

By removing the uncertainty and uncontrollability, the patients had less of a need for painkillers. You see, pain is a signal telling us to keep off damaged tissue. During times of stress, that signal warns us that we are in greater danger of doing more damage. But when that stress is removed, the signal is no longer quite as strong. Now, patient-controlled analgesia, as it is now called, has become standard practice in many hospitals. But can we control our stress in the workplace?

While we can't control the financial markets, we can control our bodies, including what we eat, how often we exercise, who we spend time with, and more. By doing this, we gain some control over our lives. Of course, this may not prevent you from losing money or getting fired, but it can help reduce the long-term damage to your body. Finally, a powerful antidote to the physical damage brought upon by uncertainty and uncontrollability is social support. In fact, social support can have an incredibly powerful effect

as seen in a study conducted in Sweden. Researchers interviewed 752 men, asking them to indicate how many serious life events had occurred to them recently, such as divorce or financial troubles.

Seven years later, the researchers followed up on the men. The death rate among those who had reported being chronically stressed was three times higher than those who had reported no stress. However, among the men who did report stress, those who had a supportive circle of friends and family showed no correlation at all between stressful life events and increased mortality.

Final Summary

As you've learned, traders in the stock market engage in irrational, volatile behavior. But this isn't necessarily caused by outside factors; instead, it's influenced by their hormones, like testosterone and cortisol. During bear and bull markets, hormones like testosterone impact the traders' decisions and make them more likely to take dangerous risks. However, if we simply diversify the trading floors by adding more women and older men, we can begin to stabilize the stock market. Today, the financial world desperately needs more long-term, strategic thinking, and women, especially, excel at this.