

EPISODE 240

Dr. Robert Lustig

Shawn Stevenson: Welcome to *The Model Health Show*. This is fitness and nutrition expert, Shawn Stevenson, and I'm so grateful for you tuning in with me today.

So I've got a question for you. Have you ever accidentally tripped and fallen into the Internet black hole?

You might ask, 'What is the Internet black hole?' And for me, I kind of get an image of *Alice in Wonderland*, right? Just falling into this endless abyss of weirdness.

And so what the Internet black hole is, is when we say, 'I'm going to check my Twitter for just a minute.' Or, 'I'll check Instagram for just a minute.' Or, 'I'll check Facebook just a minute,' and then suddenly it's thirty minutes later.

It's an hour later and you're just like, 'What in the-? How in the world did this happen to me? Where did the time go?' It just pulls us right in and the crazy thing is, believe it or not, these simple things that we've come to accept as normal are actually programmed and created with a very specific purpose, which is to keep you addicted, which is to keep you in that perpetual Internet black hole.

You're swimming around in there, and you can't really find your way out, and when you do you want to get back into the black hole. So there's a little bit of this strange addiction happening.

Now is it right or wrong? That's not what we're here to discuss. You know because the reality is it's not going to slow down anytime soon, and it's a part of our reality, and it's amazing because it helps us to connect, it helps us to share, it helps us to grow, it helps us to stay informed and stay educated, but we just don't want it controlling our lives.

And also we look at the food picture, for example, and there's this really interesting phenomenon with something called vanishing caloric density.

Food manufacturers today, if you would even call it food, have created products that when you eat them, your brain doesn't even know that you actually got any calories from it so it'll just say, 'Hey,' and just keep on putting food in and you don't get that same satiety.

You don't get that same signal saying, 'Hey I've had enough.' And if you've ever had a Cheeto, that literally dissolves into thin air, then you know what I'm talking about. And the whole moniker that you can't eat just one, yes the system is set up that way.

And so again, will you eat a chip again? Probably. Is that a problem? No, not really, but we want to be awake. We want to be aware. We want to be empowered in the decision that we're making so that we can make better decisions, so that maybe we're going for a higher quality snack, or a higher quality Internet snack in so that we don't lose ourselves.

And today we've got on probably the top person in the world in understanding how our brains are being hacked by media, by food manufacturers, and so much more. And I'm so grateful to have him on today.

Before we get to the show, I want to give a quick shout-out to our show sponsor, www.ONNIT.com. Head over to www.ONNIT.com/model and you're going to get 10% off all of your health and human performance supplements.

I'm a huge fan of the Hemp Force Protein, I've been using it for many years. This is quite possibly the most bio-available form of protein that's going to be found in hemp.

This has a high ratio of something called albumin, and this is why people tend to go if they're trying to get their swole on, their body-builder on, or trying to be healthy, they'll start eating egg whites, which is just kind of weird.

The egg doesn't come like that, you know? And also it's not that tasty, let's just be honest. It's not one of those things like, 'I can't wait to have an egg white omelet. I can't wait to scramble up these egg whites with a little salt.'

But we'll sacrifice, you know? We'll make decisions based on the results that we truly want, you know? And that's really what this whole process is about, is just finding out what works for us, experimenting.

You know sometimes we're going to do some things that aren't that pleasurable, and we'll kind of just tough our way through it, but I'm here to say that you can absolutely enjoy the process of getting well. You can enjoy the process of being healthy, and your food can taste good.

And so I just had some protein pancakes. You know, I threw in some of the protein powder into the pancake mix for my birthday recently, that was amazing. And just for my kids when I'm making their smoothies, that kind of thing, I give them the Hemp Force Protein as well.

And this is organic, it is low-temperature processed, so you're actually retaining the nutrients that companies say are in their product, it's actually in the product.

So make sure to head over, check them out, grab some Hemp Force Protein, check out their fitness equipment, they've got the most amazing fitness equipment.

They've got Marvel kettlebells. They've got an Iron Man kettlebell, they've got Captain America weight plates. They partner with Marvel. Not everybody gets to do that.

Marvel is like super secretive, top-level, like The Hand, right? Shout-out to everybody who knows about some of the Marvel stuff, the Daredevil, that kind of thing. They're super-secretive in who they work with, but Onnit actually partnered with them. So check that out as well.

Head over to www.ONNIT.com/model. Now let's get to the iTunes review of the week.

iTunes Review: Another five star review titled 'A Whole New World,' by Bozzie.

'Shawn, I cannot state powerfully enough the magnitude in which your input has affected my life. After hearing your cameo about sleep starts in the morning on another podcast, I quickly bought 'Sleep Smarter' and have been hooked ever since.

You have inspired me to shift my life in the direction of health and wholeness and to share my knowledge and experiences with others.

In many years when I look back on my journey into this field, I will undoubtedly know that the vision and inspiration you provide here was pivotal to my personal evolution.

A million times over, thank you, thank you, thank you.

Shawn Stevenson: Thank you so much, I appreciate it beyond words. And very excited for you, and very excited for what's to come, and I'm just grateful to be a part of your story.

I'm happy that you found out about what we're doing, and thank you for just being a part of the mission, because we're really all in this together. Nobody can do this on their own.

And so the more people that are awake, and that are aware, and that are taking action- taking right action to uplift ourselves and to serve others, that's what it's really about. So thank you so much for leaving that review.

And everybody, thank you for leaving those reviews for me over on iTunes. Please make sure to keep them coming. If you've yet to leave a review, pop over there, leave me a review! It will take you five seconds. Maybe two minutes, but just hop over there and do that.

I truly, truly do appreciate it.

And now, on to our special guest and topic of the day.

Our guest today is Robert Lustig, MD. And he's a professor of pediatrics in the division of endocrinology, and a member of the Institute for Health Policy Studies at the University of California San Francisco.

He's authored 120 peer reviewed articles and 70 reviews, as well as the acclaimed book, 'Fat Chance: Beating the Odds against Sugar, Processed Foods, Obesity, and Disease.'

He's mentored thirty pediatric endocrine fellows, and trained numerous other allied health professionals.

And he's a former chairman of the Obesity Task Force, of the Pediatric Endocrine Society, and a member of the Pediatric Obesity Devices Committee of the US Food and Drug Administration.

And I usually don't read everybody's bio like this, but he's accomplished so much, and I really wanted to make sure that I didn't leave anything out.

He's also the President of the nonprofit Institute for Responsible Nutrition, which is dedicated to reversing childhood obesity and Type 2 diabetes.

And he consults for several childhood obesity advocacy groups and government agencies, and Dr. Lustig lives in San Francisco with his wife and two daughters.

And now, he's here on *The Model Health Show* to talk about his new project, 'The Hacking of the American Mind.' I'd like to welcome to *The Model Health Show* Dr. Lustig. How are you doing today?

Dr. Robert Lustig: Thank you so much, Shawn. I'm doing great.

Shawn Stevenson: I'm very, very excited to have you on the show, and when I was first introduced to you, it was probably the most downloaded videos or viewed videos on YouTube when you were talking about 'Sugar: The Bitter Truth.'

Powerful, powerful stuff and we'll put that in the show notes for everybody.

But I'm curious, what got you there to standing on that stage and sharing that information? What is your origin story? What got you interested in medicine in the first place?

Dr. Robert Lustig: Well I've been interested in medicine since I was a kid. I'm a neuroendocrinologist, which means I'm interested in how the brain controls the

hormones in the body, and how those hormones ultimately control the brain in terms of behavior.

I probably got interested in this in seventh grade when I did a project on an area of the brain no one knew anything about called the hypothalamus. It turns out it's the seat of all hormonal control. And it's where the tracks that ultimately lead to obesity emanate from.

And it's an endocrine disorder, it's in my bailiwick, and it was my charge to do something about it.

Shawn Stevenson: Wow. You didn't know this, and before I even picked up your book we just did a show on cravings, and I talked about the appetite regulating network in the hypothalamus, was a part of the conversation.

And so I'm definitely just so grateful that you pioneered some of this conversation and getting it out there for people to get a better understanding of what this looks like.

But in this new project, one of the foundational pieces that you deconstruct for us in the book that I think is essential for protecting our mental health and physical health today in all that we're exposed to is the difference between reward and contentment.

So I want to talk about that, but first before you get to that, what was the inspiration personally for you doing this new project in 'The Hacking of the American Mind'?

Dr. Robert Lustig: Well ultimately we're going to talk about two biochemicals; we're going to talk about dopamine and serotonin. I was a post-doctoral fellow at the Rockefeller University back in the 1980's and so I knew about the connection between these two neurotransmitters in our brains, even back then.

But at that point in time, we didn't have the clinical studies, and we didn't have the neuroimaging in humans to be able to really make head or tail of what we had seen in the basic science in rats.

Well that has matured, that information has been moving forward over the last 25 to 30 years to the point where now the story is pretty clear, and very obviously we have a huge problem in this country with both addiction and depression.

We have the opioid crisis, we have the depression crisis which nobody talks about because people are on SSRIs (selective serotonin reuptake inhibitors) pretty much nonstop.

We are almost at 15% usage at this point, and it's affecting our mental health, and it is affecting our ability to pay for healthcare. And the entire healthcare debacle that we are currently embroiled in emanates from this issue.

The chronic metabolic diseases that we are paying for and can't ultimately afford are really just the outward manifestations of our conflict between this issue of reward and contentment.

So in 2014 I was visiting a medical school and giving psychiatry grand rounds, and a lady who was in charge of their outpatient recovery program was giving me a tour.

And she herself was a reformed heroin addict, and I was asking her about the experience, and she said to me, "When I was shooting up, I was happy. What my new job has given me is pleasure."

And I looked at her and I said, "Wait a second." I said to myself, 'That's exactly wrong. She's got it exactly opposite.'

And I thought to myself, 'Gee maybe that's the reason this woman was an addict.' So I went back and talked to my colleagues and they said, "Oh yeah, yeah people mistake this all the time."

I said, 'You know, this is a book,' and here we are.

Shawn Stevenson: Wow. Wow. Well that was- part of the big process for me, and kind of waking up and seeing the big picture was how you articulated and broke down the difference between these two, and I think it's paramount for people.

That's such a great example right there, in talking about someone who's addicted to drugs, and how they perceive pleasure versus true contentment.

So can we kind of dive in and give people a context of what those two things are, and how to identify them better?

Dr. Robert Lustig: Absolutely. So in the book I equate pleasure with the reward system. There is an area of the brain called the reward system. The ground zero for the reward system is an area deep inside the brain called the nucleus accumbens, and it's where dopamine works.

Dopamine is the pleasure and learning neurotransmitter. 'This feels good, I want more.'

Conversely, there is another area of the brain where a different neurotransmitter is made called serotonin. And this is the contentment pathway, and contentment and happiness are relatively- I won't say synonymous, but certainly contentment is sort of the baseline level of happiness.

I mean there are different levels of happiness; rapture, and elation, and what have you. But contentment being sort of the basal level of happiness.

Now it turns out that serotonin innervates the entire brain in a different way than dopamine. These are two separate pathways, but it's how they interact that ultimately forms the nugget of truth in this story.

So let's parse these two terms; pleasure and happiness. Reward and contentment.

So pleasure is short-lived, happiness is long-lived. Pleasure is visceral, you feel it internally. Happiness is ethereal, it's something that is sort of above the neck as it were.

Pleasure is taking, happiness is giving. Pleasure can be achieved with substances, happiness can not be achieved with substances. Pleasure is experienced alone. Happiness is usually experienced in social groups.

The extremes of pleasure, whatever they are be they substances or behaviors- so we can talk about nicotine, alcohol, tobacco, sugar, morphine, heroin, et cetera, or we can talk about behaviors like Internet, shopping, pornography, social media.

All of the aspects of pleasure, all the things that lead to pleasure in their extreme lead to addiction, whereas there's no such thing as being addicted to too much happiness.

Shawn Stevenson: Right.

Dr. Robert Lustig: And finally, pleasure is dopamine and happiness is serotonin.

So two different areas of the brain, two different neurotransmitters, two different sets of receptors that transduce that signal, two different mechanisms of action, two different sets of regulation.

So like, who cares? Why do we care? What's the purpose? Why do we need to know?

Well here's why. On a science level, dopamine is excitatory. It's an excitatory neurotransmitter. It excites the next neuron.

Now neurons like to be excited, they like to be tickled, that's why they have receptors in the first place, but they don't like to be bludgeoned.

Chronic over-stimulation of neurons cause neuronal cell death. Neurons are very, very tenuous. That's one of the reasons why Alzheimer's disease is going up so severely is because our neurons are dying.

And it's very easy to kill off a neuron. They need more oxygen, they need more glucose than any other part of the body.

And so if you over-stimulate a neuron long-term, that neuron will die.

Now neurons know this, and so they have a plan B. They have a defense mechanism if you will where they downregulate the receptors so they can't be stimulated as severely.

So what does this mean? Well you get a hit, you get a rush, the receptors go down. Next time you need a bigger hit to get the same rush because there are fewer receptors, and then the receptors go down.

And the next time you get a bigger hit, and a bigger hit, and a bigger hit, and a bigger hit until finally you get a huge hit to get nothing, and that phenomena is called tolerance.

And we've all experienced tolerance in some fashion, many people with drugs, but certainly a lot of people with food. And ultimately when the neurons start to die, that's addiction.

Conversely, serotonin does not downregulate its own receptor because it's inhibitory rather than excitatory. So you can't overdose on too much happiness, but there's one thing that downregulates serotonin; dopamine.

So the more pleasure you seek, the more unhappy you get. And this is a nugget of truth that a lot of people have postulated in their own lives, but we actually now have the science to explain it and to back it up. And you can't solve a problem if you don't understand it.

Shawn Stevenson: Wow. This is powerful, and hopefully everybody's really waking up and taking a peek inside of their own minds and how we perceive reality, because again the stimulation and the things that we look for to draw out that dopamine response, they're just becoming more and more and more abundant and available.

And then we see today, I think it would be justified to say there's a deprivation of happiness. And we're- as a society you see this even with all the books coming out about happiness, and positive psychology.

We're trying to figure this stuff out, where you're saying we might be looking at the wrong thing. We don't need more stuff to make us happy, we need to be mindful of the things that could be stimulating dopamine.

Dr. Robert Lustig: Indeed. It's almost impossible to be happy when your dopamine system is going great guns all the time because the stimuli are everywhere, and they are everywhere because they've been placed there, and they've been placed there because it's profitable.

And ultimately this is a plot. Not a conspiracy, but a plot. A conspiracy would require collusion between industry actors, and I do not have any data ultimately to support that except for what we saw with tobacco.

You know, the tobacco industry clearly colluded amongst the different companies to addict us, and to tell us that nicotine wasn't addictive.

So we have that, but for the rest of this we don't have specific- the smoking gun if you will, the conspiracy theory. And I'm not a conspiracy theorist by nature, but I will say that this is a plot because individual companies learned that they can message specific things, or they can add different things to their product like food, like sugar to food in order to get us to purchase more.

And that was their goal. It was designed with a profit motive.

But in the process of enacting this plot, America has gotten fat, sick, stupid, broke, addicted, depressed, and most decidedly unhappy.

Shawn Stevenson: That is like the best and worst movie title ever right there. That's powerful.

Before we kind of dissect what we can actually do about this, because for a lot of us this is like- it's a tough pill to swallow.

Dr. Robert Lustig: It is.

Shawn Stevenson: But this whole process- it's really again about becoming aware. Awareness really trumps everything and starts a process of healing.

But I want to talk about when you mentioned our brain cells dying. And other brain cells- I'm sorry, other cells in other places of our body don't function like brain cells do.

Dr. Robert Lustig: Right.

Shawn Stevenson: And as soon as you said that I thought about stress, and I thought about this specific stress hormone that's getting a lot of bad press, which is cortisol.

So let's talk about cortisol and the fact that it's not merely just a bad guy. Let's start there.

Dr. Robert Lustig: Okay. So our bodies are designed to withstand acute stresses. Imagine you're a pygmy in the African jungle, and you're there with your loin cloth and your spear, and you're out looking for lunch.

And you hear a little rustling in the bush and you part the bush, and ah there's a porcupine and you go, 'Lunch.'

And then you hear some rustling behind you, and you turn around, and there's a lion licking his chops, and you realize you're lunch.

What are you going to do?

Well first you're going to throw the spear at the lion, you're going to miss, and then you are going to run. Okay? And you're going to run faster than you've ever run before.

Now that fight or flight reflex that everyone has experienced in some fashion, the heart racing and all of a sudden you can run faster than you've ever run before, that is due to two glands that sit on top of the kidneys called the adrenal glands, and the adrenal glands are your stress glands.

The initial hormone that is released, that gets your heart racing, is called epinephrine or adrenaline.

Now that epinephrine boost that gets you running has about a ten minute lifespan, but that lion is still chasing you. So your adrenal glands have a second hormone that picks up when the epinephrine falls off that can keep you running for hours.

This is the hormone that basically- the marathoners use to basically fish glucose out of their livers and out of their muscles to be able to power them during a race, and that hormone is called cortisol.

Now cortisol is a stress hormone. It is a stress hormone that we need, it is a stress hormone that keeps your blood sugar up and your blood pressure up under adverse circumstances. If you don't have cortisol, you die, so it's a very important hormone.

However, our bodies are designed to have short bursts of cortisol, not long drawn out cortisol forever.

Chronic stress, the kind that you get from your job, or the kind that you get from sleep deprivation, ultimately that cortisol- that long-term cortisol causes brain cells to die as well because those brain cells ultimately need more energy in order to be able to respond to cortisol.

And when those neurons die, you end up in the same place as if you had addiction. And what it does, is it causes an area of your brain in the front here called the prefrontal cortex, the area over your eyes, which is the Jiminy Cricket of your body if you will.

It's the part of your brain that tells you not to do stupid things, and what it does is it basically kills that, and you end up basically acting on impulse at that point rather than being able to rationally assess a situation and react cognitively.

You instead react viscerally and you basically lose your ability to modulate pleasure, and you get sucked into the rush and the hit and the tolerance and the addiction.

Shawn Stevenson: Wow, Jiminy Cricket. That's the first time I've thought about that in the context of what cortisol could do to us. And it's true, you know?

We all have these higher order functions that basically could shut off when we're in this heightened stress state.

And so for many of us we're just living in that. It's a little bit lower grade, and it's happening all the time.

And one of the things you mentioned in the book really briefly was the impact that this can have on the hippocampus. And you referenced the movie *Inside Out*.

Dr. Robert Lustig: Yeah.

Shawn Stevenson: Can you talk a little bit about that?

Dr. Robert Lustig: Well the hippocampus is your memory center. When you were a kid, the first time you put your hand on a hot stove, that's in your hippocampus. Okay that is branded into your hippocampus. You will never do that again.

And the thing is that our hippocampus is our memory center, and it is the single part of the brain that is most susceptible to cortisol overload. And when your hippocampus goes, it's restraining another area of your brain called the amygdala, and the amygdala is your stress and fear center.

And so when the hippocampus isn't able to do its job, the amygdala goes berserk and then basically everything becomes a conflagration, everything becomes blown out of proportion and you basically lose your ability to self-control.

And we are seeing that now in people worldwide. We see the addiction, we see the abnormal and altered behavior of people, we see the depression that comes from chronic cortisol over-exposure.

Shawn Stevenson: And you mentioned also Alzheimer's, and just the degradation and loss of being able to make new memories. And you mention in the book that the hippocampus is like the set of the movie *Inside Out*, which is a cartoon.

If you haven't checked it out, Pixar, it's amazing. Having a five year old, we check out these things. That one grabbed my heart, man. You know and also when you have kids, you start to become more sensitive.

I used to be like, 'I'm Karate Man. I bleed on the inside, or I cry on the inside.' But now it's just like any of these little movies just really get to me.

So guys, if you haven't seen it, check that one out. But that is, it's the set for our memories being built and to protect them, and cortisol can really do a number on that part of it.

Dr. Robert Lustig: Well you know in the movie, Riley the protagonist, the eleven year old girl basically her- she fries her hippocampus, and her amygdala is going great guns, and she gets on a bus to nowhere. In part because she has lost her ability to cognitively determine what can happen to her.

Shawn Stevenson: How movies today are reflecting reality. You know, and these kids' movies, and it's just always opportunity for deeper level of learning.

And so what I want to talk about next is this connection. I want to talk about the connection between dopamine, cortisol, and serotonin. But we're going to do that right after this quick break, so sit tight and we'll be right back.

Alright we are back and we're talking with the incredible Dr. Robert Lustig about his new project, 'The Hacking of the American Mind.'

And before the break we mentioned that we were going to talk about the connection as we've built upon this moment between dopamine, cortisol, and serotonin.

So Dr. Lustig, if you would please take the floor and help us break this down.

Dr. Robert Lustig: Okay. So dopamine fosters more dopamine because dopamine says to your brain, 'This feels good. I want more.' And so what happens is you engage in more behavior or more substance use, whether it be sugar, alcohol, nicotine, tobacco, morphine, heroin, et cetera.

As the receptors go down, your need for continued exposure becomes greater and greater, and you develop tolerance.

Then you knock off the neurons with cortisol, with stress, and now you're addicted because you have no ability to self-control and basically without those receptors that have been downregulated, you now need a hit all the time.

And so addiction is clearly one manifestation of this phenomenon going wrong.

On the other side we have serotonin, and serotonin makes you feel contented. 'This feels good, I don't want or need any more. I'm happy with where things are right now.'

Here's the problem, there are many things that down your serotonin including technology, drugs, bad food, sleep deprivation all impact on your serotonin and cortisol (that stress hormone) downregulates that serotonin receptor.

And so the less serotonin, the more unhappy. The fewer serotonin receptors, the more unhappy.

And so there's depression. That's clinical depression right there. And if not clinical depression, then at least unhappiness if nothing else.

Shawn Stevenson: Yeah.

Dr. Robert Lustig: Well so it turns out that the same things that cause addiction are the same things that cause depression as well. And so they do tend to run hand in hand.

And if you ask most addicted people how they feel, they will tell you that they are extraordinarily unhappy. So it's kind of a vicious cycle.

And the question is how do you dig yourself out of that once it's occurred, and of course how did you get into it in the first place?

Shawn Stevenson: Absolutely. And so let's talk about that. Just to get right to it, how did we get hacked? What happened? How did this take over? Take place?

Dr. Robert Lustig: Right. So first of all, let's decide on the definition of the word 'hack.'

So 'hack' is actually a relatively new term in American lexicon. It actually started in 1955 at my alma mater, MIT, when the MIT model railroad club invented the word as a unique solution to a complex problem.

And what it ultimately took on was basically a prank where the perpetrators showed whimsy and style in the perpetration of the prank.

An example, stealing a car is a felony offense. Stealing a Boston Police Department vehicle, disassembling it, carrying it up five stories to the top of the Great Dome of MIT, reassembling it, and putting a police mannequin with a box of donuts in the passenger's seat- okay that's a hack.

So the tech world adopted hack, and they made mean clever responses to complex problems. But that's called 'white hat hacking.'

But we're all now aware of 'black hat hacking' where basically people steal your hard drive, or people get into your computer and crash it, or steal DNC emails, et cetera. These are all 'black hat hacking.'

So the question is can your brain be hacked? Computers can be hacked, but can your brain be hacked? And the answer is absolutely.

And we are being hacked right now, and most of the hacking is right now coming out of the White House, this concept of fake news. The concept of what's going on in terms of being able to believe the media versus other sources of information.

This is all-

Shawn Stevenson: Alternative facts.

Dr. Robert Lustig: Alternative facts. This is all methods of hacking. And we had a name for it in the past, it was called propaganda. So what's the difference between marketing and propaganda?

Marketing is using science to support your point of view. That's marketing.

Propaganda is not using science to support your point of view. Okay? And therefore providing disinformation.

So the difference between marketing and propaganda is the truth. Ultimately, the truth.

Shawn Stevenson: Interesting.

Dr. Robert Lustig: So the question is who gets to decide the truth? Well the person doing the hacking, unfortunately. And we've now learned through experience what's really going on here.

So I'm here to tell you that this is about the science, and if you don't believe the science, that is your business but then if you don't understand the science, you will never be able to solve the problem.

So who did it? Well it's been going on a long time.

Aristotle once said, 'The avoidance of pain and the pursuit of happiness is a first principle for it is this that we do all that we do.'

'The avoidance of pain and the pursuit of happiness,' and I think we can all get behind that.

Enter the autistic aspergian philosopher of the late 1700's named Jeremy Bentham. He happened to be the founder of University College London, and he took Aristotle and turned it on its head.

And what he said was, 'The avoidance of pain and the pursuit of pleasure is what it's all about.' And he equated pleasure and happiness and good all as the same thing because they come to the same thing.

And so pleasure became happiness, and that actually was one of the things that was in the minds of the people who invented the German stock market, and we in American now use that same paradigm for our stock market.

The pursuit of money, the pursuit of pleasure ultimately being the pursuit of happiness.

Another thing that happened in 1929, we had the stock market crash, and it was then that we developed something called the gross domestic product, GDP.

And the person who invented it said that GDP would never be able to determine the welfare of a nation, yet today we use GDP as determining how well we're doing.

The problem is GDP is a piece of crap because GDP does not take into account sustainability, it does not take into account health, it does not take into account the fact that some things cost us, and then we have to spend other things to fix what we broke. Like for instance, oil production goes into GDP, but unfortunately pollution, cleaning it up also goes into GDP.

Shawn Stevenson: Yeah I actually just saw this special about nuclear waste, for example.

Dr. Robert Lustig: Absolutely, another perfect example. So it turns out that GDP is food plus pharma, but health is food minus pharma. So equating GDP with how well we're doing is actually a big lie.

And our current president believes that the only thing that matters is the money, the only thing that matters is raising GDP. Ultimately that is at our expense.

And when we adopted GDP, we went from being individuals to being consumers because the only thing the government cared about was whether we spent our money.

So that was another hack.

And then finally the last set of hacks have occurred more recently. One of the major issues is the fact that corporations have been able to fall under the rules of people.

Citizens Unite in 2010 basically said corporations are people, and they can do anything that people can do. The problem is that people go to jail, but nobody who works for a corporation ever goes to jail as we learned during the bailout.

\$777 billion and no one went to jail, and the reason is because they worked for a corporation. So corporations get all of the advantages of people, and all the advantages of corporations.

They can now do whatever they want and there is no penalty. There is no recourse. They have been basically chipping away at individual rights for four decades, and it's all been orchestrated through Congress in the Supreme Court, and we now have bill mills to basically take away our rights, the most important one being something called ALEC, the American Legislative Exchange Council, which now pays off more than half of Congress to introduce bills paid for by the industries that fund them.

So we have been losing our ability to create our own happiness, and we are now subject to corporate interests in terms of generating pleasure, and we are suffering because of it.

Shawn Stevenson: There is so much depth to this. You know, this is not looking at the surface symptom. And thank you for breaking these pieces down, and even looking at where did this begin, and kind of bringing to light some of the things that are happening behind the scenes.

You know like I mentioned earlier about the toxic dumping, and not thinking about- and this is something Native American cultures would think for ten generations ahead, whereas today- in this special they were showing after World War II they were literally taking these containers of toxic waste- and they sealed them up really nicely, but they were dumping them out into the ocean right by New Jersey.

And it brings a whole new definition to *Jersey Shore*. Like the show would be so different if you think about the toxic residue that's happening there. And of course these things still biodegrade, and not thinking about the bigger picture, like what's going to happen for us?

Just basically I just hope something doesn't happen.

By the way there was one little part, I've got to mention this, where a canister would not go underwater, they used cement to try to drop them, and they came by with the machine gun and were shooting at this canister of toxic waste. Yes.

So that is the level of thinking that probably created Ding Dongs.

So on that note, let's shift gears and talk about some solutions. Alright and there's so much more in your book, and this is for people who really want to take a peek behind

the scenes, and you just did a phenomenal job of breaking down so many things that I've thought about, that I've talked about to a whole other level.

But you mention our solution, our guide, our protection are these four C's. Alright so let's talk a little bit about each one of these. Let's start with the first one.

Dr. Robert Lustig: So the goal is to tamp down your dopamine. I mean dopamine's okay, I mean pleasure is alright, it's not like I'm against pleasure, but not all the time. You know? I mean make it special.

Constant consumption, constant searching for pleasure makes people very unhappy. Ask any addict.

So tamp down your dopamine and up your serotonin, and hopefully lower your cortisol. Those are the three things that we want to sort of do to try to preserve our brains, our function, our lives, our families.

And it turns out that the things that do that, the four things that do that are things your grandmother told you, and they're all free, and anyone can do them.

But you have to do them. They're all active. You have to perform them, you can't just let them happen. So you have to be aware of them, you have to understand them, you have to understand why they work, and that's the point of the book.

So I call them the four C's, each one starts with a C, we'll start with number one.

Connect. Interpersonal connection. Eye to eye connection. Not phone to phone, not computer to computer. It has to be eye to eye, and the reason for that is because there is a set of neurons in your brain called mirror neurons that actually read the expressions of the people that you are talking to and translate it into empathy, and empathy is read out by a specific area of the brain which drives serotonin production.

So in the process of achieving empathy, we ultimately achieve happiness.

So visiting a sick friend, helping a colleague with a problem with eye to eye contact. It's one of the reasons religion works.

So there are a lot of religions, and they all work. If it was about the religion, then only one religion would work, or none of them would work depending on how you feel about God.

They all work, and the reason is not because of the religion per say, but because of the interpersonal interaction that occurs when people get together around a common interest and belief.

So it is that interpersonal interaction that drives the contentment of religion.

Here's the problem. Facebook does not drive contentment. It does not drive interpersonal interaction. You can not have a relationship with anonymous. And those 'likes,' all they do is generate dopamine. So it's almost a trap if you will.

So understanding connection, and if you don't understand that and you think that somehow using your devices provides connection, basically you are what Sherry Turkle at MIT calls being alone together, and I couldn't agree more. So that's number one.

Number two, contribute. Now contributing does not mean to your bank account. Okay? You have to contribute to outside yourself. You have to contribute to making your world in some fashion a better place.

Can you get contentment from your job? And the answer is absolutely 'if,' and there are two 'ifs.'

If you can see your work helping others, and if your boss can see it too, then you can derive contentment from your work, and hopefully people are gravitating toward jobs where they can do that. But otherwise you have to find some other mode of contribution that will work for you.

And it can be various things. It can be volunteerism, it can be philanthropy, it can be manifestations of self-worth. Saving leads to contentment, spending leads to reward.

So being able to save, and use cognitive restraint in being able to actually amass a bank account will actually provide contentment rather than spending it, which ultimately does not. So the concept of contribution.

Third, cope, and cope is three specific things. Sleep, mindfulness, and exercise.

Each of those tamps down cortisol. If you are sleep-deprived, your cortisol is going great guns, you are basically frying your neurons and you're getting hungrier because cortisol is a direct stimulator of appetite.

Therefore driving all of the diseases of insulin resistance, driving diabetes, hypertension, cardiovascular disease, et cetera. Not good.

So getting enough sleep, and the problem is that if you sleep with your cell phone in your room, you're getting 28 minutes less sleep than if you charge your cell phone out of your room.

Cell phones are a slot machine in your pocket. They are driving dopamine, they are not helping you cope.

Shawn Stevenson: Wow.

Dr. Robert Lustig: Mindfulness. So we all prize this phenomenon we call multi-tasking where everybody has to be able to do ten things at once. Well it turns out only 2.5% of the population can actually multi-task. Everybody else is just uni-tasking and just changing gears in the middle.

And what that does, is that drives up your cortisol, and you end up doing none of your jobs well, and all you do is hurt yourself in the process.

So the idea that you can actually dissociate your different responsibilities and bend them so that you can accomplish each one in turn, and not looking at your cell phone, because that's the ultimate distraction.

To keep your cortisol down in order to be able to keep your neurons working, that would be a really good thing.

And then finally, exercise. It turns out exercise has many benefits, none of which have anything to do with weight loss. There is not one study anywhere on the planet that shows that exercise causes weight loss. If anything, exercise causes weight gain because exercise builds muscle, and muscle weighs more than fat.

So you can lose fat, gain muscle, build mitochondria, thereby improving insulin sensitivity, improving mitochondrial function because now you have newer and more mitochondria. All good, but not because you lost weight. And this is the biggest myth in this whole business.

It is that you can somehow use an app to try to increase your level of physical activity. None of them work. So this is another sort of rabbit hole that people have gone down and can't get out of.

So the concept of using exercise as a mode of improving contentment and improving your serotonin is very, very important.

And then lastly, the fourth one, cook for yourself, your friends, your family.

Number one, it's connecting because you're sitting down with your family or friends at a meal. That's connection.

It's contribution because you're contributing to something outside yourself.

And it is coping because you are not eating something out of a box, and you should have to be mindful in order to be able to prepare a recipe.

So sitting down with your family and friends, and cooking food where you know what went into it, and there are three items in food that matter. Tryptophan, because it's the precursor of serotonin. Omega-3 fatty acids because they improve neuronal

health, because they are important parts of the white matter that surround nerve cells called the nerve sheath. And finally, fructose which there's too much of, that's the sweet stuff in sugar which actually depletes serotonin, ups dopamine, and drives metabolic syndrome.

So if you cook a meal for yourself using real ingredients, you'll be getting more tryptophan, more omega-3's, and less fructose, therefore more contentment, more happiness, more health, more life, more everything, and hopefully we can turn this around.

Shawn Stevenson: This is just blowing my mind. Fascinating, and I love the fact that you shared this is something that a grandmother would share. You know, this stuff is so simple, but today of course it can seem to be more complex.

And I'm so grateful for you taking the time and the energy, and I know what it takes to make a book, and especially one of this magnitude it's been years and years and years of study, of application, and of execution in the making.

So Dr. Lustig, this has just been phenomenal, and I'm so grateful for you being who you are and putting this work together.

Can you let everybody know where they can find your book and where they can connect with you online?

Dr. Robert Lustig: Sure so the title of the book is 'The Hacking of the American Mind: The Science behind the Corporate Takeover of Our Bodies and Brains.'

It is on Amazon, it is in bookstores, the release date is September 12th. I will be touring the country on a book tour in New York, D.C., Columbus, Ohio, Chicago, Los Angeles, San Francisco, and I will also have a Canadian tour; Montreal, Toronto, Vancouver, and Calgary in November.

So I hope this makes sense. It is science, real science, it's the application of science, it's where science meets policy and where policy meets culture.

And if you want to understand why we live in the world we do, and what you yourself can do about it to live in a better one for yourself and for all, maybe this book would help.

Shawn Stevenson: Perfect. Dr. Lustig, again thank you so much for sharing your gift, we appreciate you immensely.

Dr. Robert Lustig: It's my pleasure, Shawn. Thank you.

Shawn Stevenson: Awesome. Everybody, thank you so much for tuning into the show today. I hope you got a lot of value out of this, and taking a peak behind the

curtain, you know *The Wizard of Oz* situation and looking at what's really happening behind the scenes with some of the things that are influencing our thoughts, that are influencing our activities, that are influencing the way that we live our lives.

And the more that we become aware, the more that we can be empowered because again, awareness trumps everything. It begins the process of knocking over the dominos.

But I love the saying that we don't know what we don't know, and so this life is really about unfolding. It's an unfoldment process, and at no point do we want to figure that we've got it made, like we've got it all figured out because as soon as you do that, that's when we start to lose. That's when we start to go backwards.

So we want to really cultivate this attitude of being a lifetime student and learning on subject matters like this, and things that might seem outside of your paradigm, things that might not seem of even particular interest to you, that just opens up a whole new opportunity for growth, and for learning, and for even learning other perspectives.

And so he mentioned a couple of really powerful things. The Jiminy Cricket part of our brain, and how cortisol can really do a number, and chronic stress on this part of our brain where our conscious resides.

You know Jiminy Cricket- and just a shout-out for everybody who knows about this, but let your conscious be your guide. Jiminy Cricket was- Pinocchio who was a wooden puppet who came to life, right? He had his Pops, Geppetto.

That's like one of the best names ever, by the way. Shout-out to Geppetto.

But he said to him, "Let your conscious be your guide," and Jiminy was his conscious in a way, and Pinocchio was a wooden puppet and he was like, "I'm a real boy," and he became a real boy. Right? But he still needed to figure things out, and to be guided by something of a higher nature, of a higher order, and that's some of the things that he helped to break down today.

And so connect. That is one of the biggest pieces, connect.

It's not about not connecting with so- I mean we have this interesting and powerful amazing ability to connect with people all over the world today, and to stay in touch with our friends and family who might not be close to us in proximity.

You know so it's not not using social media, but let's get a healthy dose of the real thing as well, and carry that with us. We do not want to lose sight of that, because that's how humans evolved.

We evolved in communities, we evolved in face to face interactions, and touch. And we require a certain amount of that. We produce oxytocin when we're close to people that we love.

We don't do that when you're close to a computer screen, right? It's a different ballgame. And understanding how when we're actually in proximity, our brains literally sync up.

And Princeton University had something fantastic research affirming this, that just being in proximity with another person, and you create rapport, your brains start to sync up. And again, we don't get that when we're doing Facetime.

But I'm still going to Facetime you, we can still Facetime and hang out, but we want to get a healthy dose of the real thing.

And so today that's one of the big takeaways, and something to add to your life proactively is to connect.

Number two was to contribute, and he mentioned to others and to yourself, right? So one of the kind of hallmark things with building financial success, financial wealth, is to pay yourself first, right?

Dopamine is driving that want to spend, and to get the new Gucci, right? Whereas serotonin is activating when we're putting a little bit away, paying ourselves for the future. You know whether that's for retirement, whether that's for a vacation off in the future, whether it's for education down the line for maybe a family member, that kind of thing, that feeling of tucking that away, of paying yourself first activates serotonin versus the desire of dopamine.

Which again, I'm not saying don't ball out, I'm not saying to not treat yourself, I'm not saying to not pop tags. We all need some- a healthy dose of le tag, but at the same time it's just looking at the bigger picture.

Again, let's get a healthy dose of contributing to ourselves in that matter, and of course contributing to others.

Finding a way to give, finding a way- not just money but giving up your time, giving up your energy, giving up your insight, giving up your resources. There's always a way for you to give no matter where you on the financial spectrum. We can't keep looking at things in the realm of money, right?

This is a human invention. We've evolved, we have different practices as far as exchange, you know? There's trading, you know?

We went through a phase- if you look at the Aztec culture, they use chocolate, they use cacao, right? They use chocolate for money, right?

There's different methods of this and humans- again it's a manufactured thing that we've all accepted. And so we want to get out of that thinking that, 'I don't have anything to give because I don't have enough money.'

And what's so interesting is that when we start to shift our paradigm and when we give more, we find that those types of things- the money, the influence, the friends, the love; so many things come back to you when you give, and it's just about opening yourself up to receiving it.

And part of the receiving process is giving. So I hope that makes sense, because we want to make this a part of our reality.

Number three was to cope. Sleep. We've obviously broken down this in ways that have heretofore never been seen on the Interwebs, right? In this podcast, and doing master classes on how your sleep life impacts your sex life, and we'll put that episode in the show notes, by the way. It's one of my favorites.

And how your sleep impacts your metabolism, and how your sleep is influencing your brain, right? How you're experiencing this whole jam, sleep is probably the biggest epigenetic influence as far as things that we are doing kind of proactively. Right?

So that, and he said something so powerful about the cell phones being in our bedrooms, and I did talk about this in a chapter in 'Sleep Smarter.'

He called the cell phone a slot machine in your pocket. A slot machine in your pocket. That's brilliant. Powerful. Always get a constant hit right there, you know?

So again, see it for what it is. We're drawn to it. And I know you've done this before, like you're just sitting there, you're doing nothing, and you just go click on your phone. You just pick it up and before you know it, you're in one of your apps. Right?

So now we can start to catch the behavior. And it's not- again, it's not that this is bad, it's just a way of being and we want to be aware and empowered so that our phone doesn't begin to creep up and to control our lives in a weird way, you know?

Because it's kind of weird if you're sleeping with your phone right next to you. Like I remember when I was a kid, like I had the teddy bear, right? And now people have the iPhone, right? I'm sleeping next to my- my iPhone keeps me safe and warm at night.

It's just weird. Right? It's weird. It's dangerous as well.

Alright so cope, make sure we're getting some adequate exercise, and he dropped a knowledge bomb about exercise does not help you to lose weight.

I know you're probably like, 'Wait a minute! All the other stuff you said was pretty smart, Dr. Lustig, but exercise does make you smaller. It does help you lose weight.'

Well in reality, food. Food is going to determine- because you could exercise all you want, but then you can just go and drink a couple of pints- you could have a couple pints of beer, and negate that exercises as far as the weight loss that would result from that.

You know, food is really the thing that moves the needle per say. Again not saying that exercise isn't a huge component, because it changes your metabolism, but food is what makes us bigger or smaller as far as that piece is concerned.

And also understand that exercise is a huge driver of contentment as well. You know, you release certain endorphins, and enkephalins, and all these things, and it's just such a gift and it's something that our genes expect us to do is to move.

And so to keep that in mind, also being mindful he mentioned in that context as well.

And finally to cook. Come on, now. You know today more than ever, we have the opportunity to not cook, right? And this is something that as humans we evolved having food that we are cooking ourselves and/or our family members, and it was just a part of the system.

And now today we've outsourced a lot of that, which is fine, but part of it and part of this process of becoming the best version of ourselves, I do feel that cooking is a form of love, right? And we don't want to miss out that love.

This is why we all feel that our grandmother or our aunt's cooking is the best, right? It's because that love is in the food. And this might get a little metaphysical but if we are looking at quantum mechanics, everything is energy and our thoughts do in fact affect the world around us.

And so having that food that's made with love, or that we're making with love, versus pulling up to the drive thru with random person X, and who probably doesn't want to be there, but- I'm not saying some people don't want to be there, but some people don't, and they could really care less about you and about the food that you're eating.

And what kind of energy are we taking into our body when we go through that? And not to mention the food itself that's been through all of the energetic weirdness that you can imagine.

When we talk about the quality of food itself, and the factory farmed animals, and the processed dough, and all those kinds of things that are treated with bleaches, and brominated, and all these different things.

And of course he mentioned the fructose content, and the sugar, and the gluten, right? The lectins, all these things.

And the put on top of that it's lacking love. Just something to think about, you know? It's something to be more proactive about as we move forward.

Alright so the four C's, put them in place, and it's a solution for all of the crazy and powerful science that is again being used sometimes not for our benefit, to control what we're doing with our minds and with our bodies.

Alright? So I appreciate you so much, and if you got a lot of value out of this, please make sure to share this out with your friends on social media, Instagram, Facebook, Twitter, all that good stuff.

Give them something good out there on the Interwebs, and something that can help them to feel more empowered as well. Because again, it's not that the technology is slowing down anytime soon, but we can add some positive programming.

We can add in some things that help people to become more empowered, and more aware, and stronger within their own bodies. Alright that's what it's really about. And I hope that this added some value for you.

Take care, have an amazing day, and I'll talk with you soon.

And for more after the show, make sure to head over to www.TheModelHealthShow.com. That's where you can find all of the show notes, you can find transcriptions, videos for each episode, and if you've got a comment you can leave me a comment there as well.

And please make sure to head over to iTunes and leave us a rating to let everybody know that the show is awesome, and I appreciate that so much.

And take care, I promise to keep giving you more powerful, empowering, great content to help you transform your life. Thanks for tuning in.