



## Transcript of “Steve Omohundro Talks Technology for a Better World”

Bulletproof Radio podcast #134



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Dave: Today's cool fact of the day is a new research is confirming that animals actually have empathy. When higher animals like chimpanzees are distressed, they console each other by putting their hands in each other's mouths. Asian elephants do it by moving closer together and stroking each other's faces and genitals and putting their trunks in each other's mouth while chirping. It looks like the human ability to empathize comes from the part of the brain called the right Supramarginal Gyrus which is located near the Cerebral Cortex. If you're lacking in this area, new study shows that compassionate meditation can rewire and rehabilitate your right Supramarginal Gyrus to increase your neurological ability to empathize with someone else or you could just do the Biohacker way and put your hand in your mouth and start chirping.

Better yet put your hand in their mouth and start chirping but we'll see how that goes. If you don't have a chance to check out Bulletproof HRV Sense, the iPhone app that works with a heart monitor strap in order to align, to monitor your stress response all day long, now is a good time to check it out. It is amazingly affordable. It's called HRV Sense and it's something I'm really pleased to have brought out. I've worn this and gone to meetings so you can actually see which meetings stress you out and which ones don't, which is kind of funny. You can also see, if coming home from your meeting stresses you out in which case you might have some other things to work out. Today's guest is an amazing guy, someone I've known for I think almost a decade.

His name is Steve Omohundro. He is a scientist, a professor, an author, a software architect and an entrepreneur but he's also one of the leaders in the field of artificial intelligence. He gave a recent TED talk on bringing more compassion and happiness to the world through intelligent technologies. This is not about replacing humans with artificial intelligence but actually making us more human by using artificial intelligence which is why I wanted him to come on the show today. He has a few little degrees like Physics and Math from Stanford

and PCM, Physics from Berkeley and stuff like that. He has way smarter than I am.

He is also, which makes him a total bad ass, trained in non-violent communication, Travell's trigger point therapies, Bohm's Dialogue, Beck's Life Coaching and Schwartz's Internally Family System Therapy. In other words, this guy is a physicist but he's not a robot zombie. It's really cool. Apologies to my other physicist friends. Not all of you are robot zombies, just like a third of you. On that note Steve, I'm really happy to have you on the show. You should have been on before now and it's an honor to have you hear today. Thank you.

Steve: Thanks for having me. It's great. You are very instrumental in my health journey and so it's really great to be on your show here.

Dave: One of the reasons that I appreciate you coming on is that, you have a little bit of a weight lost experience when you're on the Bulletproof diet and in fact, even on an alpha version of this when I was really first laying out the principles and I can say thank you Steve, because you're one of the guys who said, "Dave, the way you've laid out this diet is unique. You should really share it because this way got through to me." What happened when you eliminate the toxic foods, cut the carbs, up the fat?

Steve: I think it was about 6 years ago. I was starting to get this symptoms that I now know were hyperthyroidism. I was getting heavier, I kind of a brain fogged, not feeling good, really sluggish. I went to the doctors and they measured the TSH which is the standard hyperthyroid thing and mine was pretty normal and said, "No, you don't have that. Just eat a healthy diet, follow the food pyramid and you'll be great." Well, I did that and got worst and worst. I read books by Joel Fuhrman and so on about the vegan diet and I tried that and got worst and worst. Then, at some point, I spoke with you and you said, "What? That's crazy. Don't follow the food pyramid. You want to eat more fat, not less fat." I was, "What?" This is like total revelation to me and you told me about the Silicon Valley Health Institute, as it was at that time.

I started going there and my God, it was revelation after revelation so I decided to try it and in the first month, I lost 20 pounds. All the brain fog went away. I was feeling great. It was just amazing. Second month, lost another 20 pounds and the 3rd month, another 10 pounds and it was just miraculous. I had tried a very low carb version and decided at that point, "Oh well, I should start adding the carbs back in." I didn't really get the whole wheat thing at that point. I started, "I wanted healthy carbs," right? I started with oatmeal in the morning and heart and healthy. I want a whole wheat bread and so on. All of the symptoms came back, like instantly. I was like, "Oh, my God." Then, I started really going into your work and Steve Fawkes and it had just been a total revelation and a major transformation.

Dave: You mentioned brain fog and you obviously make a living like I have always done with your brain, not really with a ... going out and using your body as much as someone who is a professional athlete or anyone who's doing physical work. The difference in how you perform from a brain fog perspective, what did you feel when the brain fog turned out, like was there a difference in your daily regulated motion or was it more just, I could think better, like how people understands your perception of the cognitive changes that come from a high-fat diet, not just losing weight?

Steve: It was huge. Certainly an increase in clarity was the big thing. I mean, I was to the point where it was hard to form sentences. You don't know what that ... the normal medical institutions don't help you in that at all. They just say, "Well, you're getting older and you know, this is a normal aspect of aging."

Dave: Here is some Prozac.

Steve: Yeah, exactly. You just think, "Well, I guess this is what it is to get older. Man, this is really bad. This really sucks." Until you start ... until it goes away and then you realize, "Holy crap, this is how you're supposed to feel." Certainly increase in clarity. There is a kind of depressive mood that comes both with the mental thing and also with hyperthyroidism in general, body temperature, all that kind of stuff, shifts and the mental clarity. Then, adding in things like your Bulletproof coffee. When I was ...

I could never drink coffee. The caffeine would ... I get very agitated and it wouldn't work for me. When I made these dietary shifts, coffee was like, the elixir of mental clarity and incredible increase in creativity and sharpness and ability to sort of do focused sustained work.

Then, combining butter, MCT oil and coconut oil was another major, major improvement in these things. None of this is in the normal literature. You talk to your doctor and, "Oh, that's saturated fat. Yeah, I would limit that. Have you thought about margarine instead of butter?" Just insanity.

Dave: I like your fat doctor voice.

Steve: That's the way they talk. The doctors, I think they get one afternoon in medical school about nutrition and the standard model is that, "Ah, the food you eat doesn't really make much difference."

Dave: Yeah. One of the things that set me on the path of Biohacking was I noticed that vitamin C made my brain fog slightly better. I told my physician at the Palo Alto Medical Foundation this and he said, "Stop. It could kill you." I said, "What about Linus Pauling?" He goes, "Linus who?" "Linus Pauling like 2 Nobel Prize kind of guy, 90 grams of vitamin C a day." I just looked at the guy, I said, "You're fired." I was so mad that this guy was so arrogant to tell me what these vitamins would do when he clearly had never studied any of the research and didn't know the pioneer in the field. I just was, "I'm going to have to do this myself" and in retrospect, and they were expert, I ended up connecting with, as a VHI and ended up becoming one of the people who ran it.

It's kind of funny that you had a similar experience and you hacked your way out of it, which is what people with a tech background will do when the symptoms get bad enough, like you were kind of desperate as I understand it.

Steve: Totally.

- Dave: Yeah and desperation does it. All right, so it helped your brain and your brain is an unusual brain. You helped to create some of the world's voice recognition technology that's used today, right?
- Steve: Well, on a research end, I was involved like Mathematica and a lot of AI systems for speech recognition, learning grammars, we built a lip reading system, a bunch of different projects like that. Yeah.
- Dave: You've done some cool stuff and I'm pleased that your brain is back online because you're doing neat stuff. Speaking of neat stuff, let's switch to your TED talk. Let's talk about artificial intelligence and how it's made humor, compassionate happy.
- Steve: Well. I'm going try, let's say it made me more compassionate happy but it certainly highlighted, I think some of my awareness about where society is going. That, we're in a really interesting period where technology and science are doing amazing things, everyday. There is like 5 new amazing results coming out. Fifty years ago, each one would have been like, the highlight of the year. Today, they're coming out everyday, I mean, they're just remarkable. We have these incredible advancements. The same time, I think a lot of people are not doing very well. I mean, mental illness is about a factor of sex up from when it was in 1938. Marriages, half of men are divorced. There is a lot of signs that our society and our technology are really not supporting the true compassionate happy nature of our population and I see technology is partly responsible for that and also as the potential solution to that, that as it gets ...
- Dave: I know what you mean. Sorry, if you're listening in your car, just picked up my phone and pretended to check Facebook. I wasn't actually doing it. Okay, go ahead.
- Steve: The perfect example where Facebook, I think on the hole, I think is actually in that positive in terms of connecting people. I've connected to all these people from my elementary school and high school. Well, we probably never have seen, if it weren't for Facebook and yet it also become a surrogate and a substitute for face to face interaction. We're in this sort of weird time and I think the technology of course is going to

continue on, getting much more ... much smarter, much more powerful, much more pervasive. One of my interest is, how can we guide it so that it encourages the best of humanity rather than sort of dehumanizing this.

Dave: Well, a lot of people don't know this but my concentration in my undergrad studies was in decision support systems. Which is marketing speak for artificial intelligence because we learned a long time ago that artificial intelligence is terrible marketing because we've been saying for like, whatever, 40 years that humans will be ... or computers will be as smart as humans, it never seems to happen so everyone laughs at it. What is artificial intelligence actually, the way you're using these words. How do you define that term?

Steve: Well, artificial intelligence is basically trying to make computer systems that make decisions, that are ... meet some goal. That ... and like you say, the actually algorithm what's really underlying almost all systems today was invented by John Von Neumann in the 1940's and it's rational economic decision making. It's abstract, it's very, very simple. If you understand the environment that you're in, all it involves is imagining the different actions you might take, seeing, simulating what those actions are going to lead to and taking the one that leads to the outcomes that are best for you. If you don't know what the environment is, then you need to try it, see what happens and improve your model of the environment as you take these actions.

That's where machine learning which is sort of the buzz word of the day comes in. These are exactly what you do in Biohacking. Where the system is your own physiology or your own mental capabilities and learning. "Woah, if I take Vitamin C, it does this. If I take Vitamin D it does this." Though these 2 interact in this way, it's a systematic way of proceeding forward. AI systems are basically encapsulating that procedure as algorithms.

Dave: Very well put. I love it that you live in that world everyday. Explaining Biohacking to people is tough because I really do have a background in computer security and I think about, you tell me I can't do it and the first thing I'll do, well, there is like 15 ways to break that system because



that's how you ... it's just how you think if you come from that sort of background. It's not that you're going to break it, it's that you're looking for weaknesses and things you can exploit and looking ... It's a different lens to look through the world. When you look at it as an Artificial Intelligence expert, I get a feeling that you have a lot of that same Biohacking angle because you're looking at like systems optimization problems.

Steve: Absolutely.

Dave: Okay. When you're optimizing a system, how do you apply that to compassion. You have an amazing array of training in psychological and therapeutic techniques which is unusual for an artificial intelligence researcher. How do you bring the system of the thinking you do into compassion which really isn't about thinking, it's about feeling. What's the connection?

Steve: I totally agree. I think that's one of the challenges that our society is facing today. That we tend to optimize what we can measure. Today, the kind of thing we measure and things like gross national product or a company is profit maximizing entity. The decisions you make in trying to maximize profit or productivity tend to not necessarily be aligned with human happiness and human spiritual growth. We end up with kind of dehumanizing elements on a lot of our societies. The country Bhutan on the other hand tries to measure gross national happiness and that leads to a very different set of governmental priorities. It place itself out in different policy. I believed ... I'm sort of a big fan of Robin Hanson's Futarchy model. I don't know if you've heard of that.

Dave: I haven't.

Steve: Most political arguments about policy are all about, "Oh, I think taxation is good. Oh, I think taxation is bad." It's all about what levers you turn rather than what outcome you're trying to achieve. What Robin Hanson says is, "No, we should have the populace voting on what do we want a world to look like." Then, have experts or he's got other mechanisms to figure out the best way to get to that outcome. I think that's the key in

rational economic thinking, is to separate out what is your goal and then what's the best way to achieve that goal.

Dave: It's awesome to have it presented that way. It's the same for any complex system including food production, right. The goal, when I'm producing something is I want food that makes you feel and perform amazing and well, which doesn't mean it taste good, it doesn't mean it's cheap which are the 2 outcomes that every food company, eventually comes down to. How do I make it taste as good as possible for lease amount of money and that's it. I voted at least in my own little world for that other outcome. What you're proposing is we could do that for most of our economic and political decision making, say, we want to optimize the system for these outcomes and allow this system to create itself basically.

Steve: Absolutely. That says, what we measure and what we sort of state, what vision we hold for where we want to end is absolutely critical because we picked the wrong goal, you're going to get stuff that you don't want. My TED talk and a lot of the AI things has been about, you just build an AI system that's trying to optimize for something like maximizing profit, it's going to do things that you really don't like. Being very clear about what kind of world we want is ... like you're doing with, around food and nutrition, people are ... and you're discovering, people are willing to spend enormous amounts of money to have better health. I mean for an individual level, health and mental clarity is so much more important than the typical measures that a food Agra company is going to use in making its decisions.

Dave: I am definitely, on a personal basis willing to spend much more on food, if it means, I'm going to save money at the doctor's office later because I won't have to go there. It means, that I'm going to have a higher quality of life while meeting a higher quality diet. At the same time, even my goals for building Bulletproof have been like I want to use Bulletproof to increase the reach of what can happen, when your Prefrontal Cortex has turned on properly by food. One of the things I've learned is that the amount of money that is spent distributing food far out strips the cost of producing food. The stuff that you're buying for \$8 at the grocery store probably cost less than a dollar to produce.

It's all the systematic and efficiency because we optimize the grocery distribution system for profit at 3 different tiers instead of 4 delivering high performance food that's nutritious and free of toxins to people at a reasonable cost, which would be nice. It's one of the reasons that e-commerce is really cool because margins can be far lower there but you're buying from the producer. All of that extra money that would have gone to the distributor and the wholesaler and the grocery store, all of those go in to making the food and then paying a shipping company to get it to you. You end up getting a higher percentage of your spend going into the food because the system is optimized for that which is kind of cool.

Steve: I totally love that. I think, the internet is at it's pace the most unbelievably democratizing technology that has ever existed. People individually are discovering what's really important to them. They don't have to follow their marketing messages anymore. The Paleo sphere and all the work that you're doing is bringing an awareness to I would say, I'm interested on what percentage of the population you think is now kind of aware of this new way of thinking.

Dave: That's a really tough question. I don't know the answer to that. Assuming a lot of people heard of Paleo but they sort of think it means like order steak. If you're eating industrially processed steak and margarine, it's not actually Paleo. Even a lot of Paleos are eating poor quality meat and don't know why, it works for a little while, it doesn't work as well. I do feel like we've reached some sort of a tipping point, where enough people realized that, "Well, there is something I can do with my diet that's going to change, not just how I look but how I feel," then it's going to be really hard to go in the doctor's office. Now, the doctor say, "Oh, it doesn't matter, have some potato chips." People realize, "Wait, I don't feel the same when I have those" and then I have all of these cravings.

There is a little bit of mistrust of receiving nutritional advice that doesn't work. That's all we need, is people to start paying attention to the system of their body. What do I put in here, in my stomach. What does it do to my brain? What does it do to how I feel? What does it do to my muscles? It's not that hard to tease it out and there is things like the

Bulletproof Diet Road Map, big book launch in December, where I'm really hoping to educate a lot of people with this knowledge. "Okay, here is a framework for thinking about it, now, go hack yourself."

Steve: Yeah. I'm really excited to see that. That your Better Baby book. My brother had a son back in the end of December and I gave him that book and they studied it and read it and it had a big impact on the pregnancy.

Dave: The epigenetic effects, what you eat now, affects the next generation, at least if you haven't reproduce yet or ... it's huge. That book was there for that reason to ... I helped Lana write it, my wife, Lana and actually use the principles but if you're on the Bulletproof Diet or you've made any positive change in your nutrition, and then whether you're planning of reproducing now, if you do. You may find that your kids are healthy and even your grandkids are healthier. It's kind of like the biggest investment you can make or the smallest investment you can make with big returns.

Steve: Huge. Now, I don't know that you've been following the recent studies of the placenta which they used to think was sterile and now, they're realizing, "No, it's going to hold microbiome that starts off the microbiome of the child." I've been sort of, there is this hologenome way of looking at the human as really an ecosystem of bacteria, viruses and human cells. We're ... the simplistic sort of medical model is turning out to be way, way inadequate for the kinds of things that we have to ... the choices we have to make.

Dave: One of the areas I explore in Bulletproof Diet Book is, what happens when you have germ free mice. Here is a mice that have no bacteria in their gut good at all. What's cool, you can feed them anything and they stay lean and thin. They're bulletproof and then you give them a little bit of normal wild an ounce of bacteria and they get 60% body fat in 14 days. Part of what's going on is that we've developed a symbiotic relationship with all of these bacteria in our bodies. They also have hacked our system. When the bacteria make neurotransmitters, well, you already had a neurotransmitter manufacturing system in the body that was perfectly good. Sometimes these bacteria are not directly

making toxins but they're causing behavior change or causing hormonal change in you, for their interest given that you carry them around.

It's such a complex system that thinking of things like a hacker like, "Wait, someone has already come in and someone has already penetrated the system and they're already putting their control tentacles into it, the same way we would if we broke into a computer system." Bacteria can be really good, it can be really bad. What controls the bacteria, the environment. You hack the environment, which hacks the bacteria that have already hacked your system. It's so cool and so complex and we know almost nothing about it.

Steve: Yeah. Yeah. That's amazing. I mean, and beginning to model and understand that complexity, lets us make the choices that are actually going to lead to the outcomes we care about.

Dave: It's probably sort of, kind of going to take some artificial intelligence for us to understand that level of complexity, wouldn't you say?

Steve: Yeah. One thing I'm excited about, there is a whole bunch of ... Google just came out, saying that they're putting a lot of money into AI systems to model health measures and they're all these, there is a whole quantified self-movement of ... the kinds of things you do of measuring ... very inexpensive measures of what's going on and use that to learn what is the dynamics of this particular person's physiology and how can they best optimize it.

Dave: I also just picked up this system, it was a couple of hundred bucks on Kickstarter, I mean, it's called Lapka. It's 3 sensors that work with the iPhone. One is a radioactive particle counter. One detects nitrate levels in food and the other is temperature and humidity. You plug it in to your iPhone and you can stick probe into a tomato or you can wave the thing around, the other one is EMF but the cool thing is it all uploads to the Clouds. You can see a global map of nitrate levels in different regions of the company in Protos versus EMFs or ... it's stuff like that. It's just coming online but when you get the Google level of visualization and the ability to bring all those stuff in.

I think the AI stuff that you're working to pioneer is going to help us realize, "Wait there is something going on here that we didn't know about" and the question of what is it now that we can measure it is going to shed more light on what it means to be human than we probably have any thought of right now.

Steve: I totally agree. I think it's also going to bring a level of transparency, like there is a horrifying video about what's going on in Fukushima, where in Japan, they're kind of covering up what the levels of radiation are. Individuals are getting little radiation meters and they're starting to create maps. You coordinate that information on the internet, suddenly, it opens up and it becomes transparent what's really going on. I think that's going to happen in every sphere of human activity.

Dave: It is and it's going to be tough for really big companies and politicians to say no, when there is this giant amount of data. We'll probably face more censorship, things like that but whatever that can happen.

Steve: One example of sort of the evidence of the increasing interest in this is, Whole Foods is a company which is devoted to trying to meet what people think is healthy. Some of which they have is healthy and so they still follow a lot of crap. It's fascinating to watch the gluten free aisle.

Dave: Yeah.

Steve: It started a few years back when I was first trying to eat that way. It was like one little shelf and it was not very good stuff and tasty. Over the years, every year, it will basically double in size. Now, in the big Whole Foods, it's like an entire aisle of gluten free stuff and lots and lots and lots of people, a lot of restaurant now mark things. "Oh, this is gluten free or it's not." Even though gluten is probably the right measure but at least it's a sort of proxy for ...

Dave: Yeah. I always want to ... Okay, what's in there? I was at a buffet at a conference recently which is really well put together to try and support everyone's weird nutritional requirements now that we're all hacking ourselves. It's like, this contains none of this, this. Well, what's left? Is it made out of marshmallows? I have no clue what I'm putting into my

body but no, I am not putting it in there. That makes me a little nervous. It's like, could you just list all the chemicals and other weird coffee in here that you think is gluten free. Virgin Atlantic, actually, I took off gluten free on the menu option and I manage to get the upgrade. This is like one of the first times ever, getting upgrade to fly in like a purple upper class section.

I was like, "Oh, I'm flaky." They give me this gluten free muffin thing and it's actually made out of wheat starch and it turn it all over and it contains 60 milligrams of gluten but it's still gluten free because it's like, less than a gram of gluten so it didn't count. This is an immuno-stimulatory thing. This isn't ... I was just like, they tried. It said, gluten free in big letters but it was a lie. We're going to have to deal with that but also, what's going to help us do that? Visualization of data and collecting the data, seeing it's there and as we get things like Google Glasses and all, they'll be able to look at them and go, "Good morning. These 15 websites say that it's not gluten free but these 5 manufacturer say it is."

The consensus vote via an AI system is that you have a 70% chance of feeling like crap if you eat it. That's what I think of when I look at everything. It's exactly that algorithm but maybe I didn't read all 15 websites. I want the computer to do it so I can be like, "That's a Bulletproof meal." That meal is like, here on the spectrum because honestly, it's never going to be perfect and it's never going to be perfectly evil. It's always going to be somewhere in the middle. I just want to know where it is so if I'm giving a speech to 5,000 people and it's going to change their lives if I rock it. Well, I'm sorry, I'm not eating a 40% Bulletproof meal. I'm having my coffee and I'm going to go on stage because I know it's in there like 3 things.

Steve: Totally, totally. If you'd look at Amazon's new Fire phone, it's got 4 cameras and it's setup so you can look at any product and they're goal of course is to recognize the product and then show you, it on Amazon you can buy it there instead of wherever you are, it happen to be physically ...

- Dave: We have to complete the war on small business, that's how to complete it.
- Steve: Yeah, exactly but that same technology could be co-opted in exactly the way you say where it ... You have your own personal AI that knows exactly what's good for your body and what's not. You show it anything you're about to do and it tells you, "Hey, buddy," like you say, "Don't eat that now."
- Dave: It's going to be a very interesting next 5 years because of all of this. That brings us closer to another topic. What's your take on Transhumanism?
- Steve: That's the idea that we can and should change the human body. I personally tend to be fairly conservative. When it comes to curing disease, yeah, totally. When it comes to enhancing capabilities, like in a way you do, almost all of those seem good. Some of them pushed the edge a little bit, like I don't know if I want to be the first one to do the transcranial stimulation, that kind of stuff. A lot of the people in that world, like specially the extropians, I don't know if you heard of them.
- Dave: Yeah.
- Steve: They sort of view it as a positive ... that changes good for change's sake in a way. I think, it's great that they want to explore in that way. Whether the whole ... my worry is that we change too rapidly.
- Dave: I'm really worried about that too. If you're just listening, I'm putting electromagnetic coils on my head while we're talking.
- Steve: I guess the question is, how do we determine what changes are like, "Yeah, this is a great improvement that's making us better." What are changes like, let's say, you have the capacity or the ability to turn off conscience and to be a good CEO, well, you turn off your conscience so you could make those hard decisions. That could send humanity down into a terrible direction. How do we make those choices?
- Dave: I worry a little bit too. I'm ... in the transhumanist camp, somewhat, I don't believe there is any necessity or, I'm interested in uploading my consciousness to the internet so I can shed my human body kind of



thing. I like the idea of making artificial system or an intelligence system that acts on my behalf as an agent so I can get things done that I want but that's not ever going to be me. I'm not in my understanding consciousness. Like, "Cool, I could make 52 copies of myself running on different machines that like do things that I like. Great. That's kind of like having an assistant. It's cool."

Steve: Yeah, I'm totally with you there.

Dave: Then, there is like upgrading your existing capacity like overclock your CPU before you throw away your hardware. I'm ... Having run a medical lab testing company that looked at immuno-activity to implants, I can tell you, a lot of people are working out implants that are triggering auto-immunity right now and they don't know it. Before, I'm going to put something with electro magnetic fields which also mess with my allergy in ways we barely understand, plus a coding of some sort that's likely to also cause an immuno-interaction, like, "Really." These are risks that are not worth taking unless maybe you lost your arm, in which case, hallelujah. There is no way, I'm taking my arms off and your placing them with robot arms, not for a long time.

Then, the risk that really scares me the most is yeah, I come from the world of security. Well, we just found out that the NSA, thank you Edward Snowden for doing this, we came to the cryptography algorithm used by almost everyone. They did this very early and very sneaky so that they could basically always break stuff that was supposed to be unbreakable. Well, if you put something in that interacts with your brain or interacts with some part of your body, you're going to trust what company that made the hardware and what company made the software. We do sneaky stuff and man, I am really not willing to do that. Then, you get a virus and the new implanted visual thing you have, this is what then gives them idea.

It gets a virus that shows in a basic porn ads all day long so you go crazy and you kill yourself. If we put hardware in our bodies, there is a real risk of that sort of stuff happening and I don't think it's going to be very pretty. I won't be the first to sign up for it but I will be the first to

absolutely amplify my side over biology and let my brain do everything it's capable of because we barely touched it.

Steve: Yup. Yup. I'm totally with you. How you find that line, like, everybody uses cellphones. Are those really safe? Do we know? I just was reading about apparently there are people all over the world that hear the hum. They hear this low frequency sound that appears to be new to low frequency radio waves. Nobody really knows what it is. It doesn't seem to have, be measurable and yet, there are people all over the world who are experiencing this thing. Do we really know enough to make fundamental changes. How could we have certainty that we have enough understanding to enable something like that.

Dave: I think that we have made some major, major experiments on people without really knowing. Even our choice of electrical carrier systems. The frequencies that we used to transport power over long distances have biological effects. I've seen them in my living room. I've measured them. I've changed people's biology, integrate painful way actually by using shaved frequencies from across the room. In my world as a Biohacker, sorry, you don't have to touch someone to mess with them and you should know that. You can ... and microwaves if you've unplugged them. These other little cellular signaling and biological signaling things, those are the areas where people say, "Well, this food won't hurt you. There is only a little bit," mold toxin is an example.

Steve: Right.

Dave: Sorry, they cost damage to your DNA. There is no hormetic safe dose. Every little bit you get adds up and they actually affect your performance lung before they kill you of cancer or something. The same thing may or may not be true EMFs and we don't know. Some people now were saying, "Well, there is no evidence." Sorry, there is tons of evidence, if you look around. It's there and there is enough evidence that I wouldn't say it's safe and there is enough evidence, I'd say it's prudent to minimize exposure but I didn't put my cellphone in airplane mode before our conversation. I'm not paranoid but my wi-fi is unplugged because I'm not using it, right?

Steve: Yeah.

Dave: The cautionary principle make sense. Do you use wi-fi?

Steve: Yeah. I do.

Dave: Okay, is it on when you sleep?

Steve: In the other room but I do leave it on. It's funny I had a girlfriend who really hated the electric clock being next to the bed. I was like, "Ah, that's bullshit, where can this be?" Took it out and it was amazing, the difference. Huge, huge difference. On one of your charts, you rate microwave ovens as being ... an undesirable way of cooking and so some of my kind of hyper-rationalist friends were looking at your chart, this is early on and kind of skeptical, "Who is this guy, what's he's saying? What do you mean microwave ovens are bad? How can that possibly be bad?" I did a little Google search and sure enough, all of these papers about the microwave frequencies are absorbed by a certain critical proteins and it damages them. Who knew, I didn't certainly didn't know that.

Dave: One of the things that sucks is that we are terrible correlation engines for understanding long term effects from an action that we did. Just biologically, we suck. I use to call myself a walking event correlation engine because all of the work I did on early internet infrastructure was always like, there is all these parts, we didn't know what it is. Somehow you can synthesize, if you had to pick, what's probably causing the trouble, it's probably this but it comes from synthesizing all these weird things. Because of my own health problems, I become pretty good at looking back in time and understanding, this happen 2 days ago but that's why, it's like I feel like a zombie. It wasn't when I did an hour ago or a day ago. It was 2 days.

When we get to like a month or when we wake up in the morning, we feel cranky because what we had for lunch, it's almost overwhelming. You're an artificial intelligence guy. How are AI systems going to fix that kind of a problem around correlation?

- Steve: One of the things AI systems, even today's pretty patsy AI systems are great at looking for correlations and structuring data. They're able to handle massive amounts of data. The whole big data movement is just exploding here in Silicon Valley. If we measure the inputs, those systems will be very good at finding those kinds of patterns. I think that's a very, very helpful thing. We have to measure that though like I've been ... one of the things that you promote a lot is the issue of mold. You don't see much about it at all in the normal media. Yet, I have several friends for whom this has been a major health issue in their lives. Thanks to you, they were able to discover it and fix it and it totally changed their experience, the quality of their life and yet, nobody talks about it. Nobody knows it. If there were mold issue here, most people would have no clue that that was what was happening.
- Dave: It's so frustrating, one of the Bulletproof employees, a good friend, her personality changed over night. She moves into a new place, and just got emotionally unstable. Really angry and would cry, this is a woman who really doesn't cry very often, that I've ever seen. It kind of, at a drop of a hat and I was like, there is mold there. There were nose bleedings and some other common symptoms, like he moved into a place with mold. It's like ... it's a new apartment and a professionally managed building. She looked and behind the cabinets in the kitchens, there was like black stuff coming out and I put it in a hotel that night and low and behold, within 3 days, she was back to her normal self. If you don't know the correlation possibility, all you know is like, I feel like crap.
- I feel like I've been poisoned. Everything went to hell and that's why, I'm filming a documentary on toxic mold, by bringing some of the worlds top experts in, as well as a bunch of people that have been affected, not to tell everyone, everything is moldy, you have to be afraid. To say, look, this is as important as asbestos or lead in paint. It's that important and it's not known. I want to push that knowledge forward because 28% of people are permanently disabled by it. The rest of us, just feel like crap, we get sick and we get cranky and we yell at people. How would artificial intelligence do that though? I want systems to do it so we don't have to do it.

- Steve: Well, I mean, the challenge is getting the inputs. Today, it's pretty much, you got to have sensors. You got to have some person recording that and so if you don't know that something might be an issue, you're not going to be recording that data. As we move forward, the world is getting more ... sensors are getting really, really cheap and for better or worse, they're going to be cameras and the kinds of sensors you're talking about, all over the place. That will enable us to kind of get a better handle on it. I mean, we are facing like ... just looking at the autism curves. Autism is exponentially growing. We're 50 times more autism cases today than in 1975. Nobody seems to know why or what's that related to. I mean there is all of this random theories but ...
- Dave: There is a guy named Roy Dittman who wrote a book called the Brighton Babies, which is very much in line with the Better Baby Book but it's like 500 pages. It's sort of like the Gary Taubes version of the Better Baby Book, which I really respect. I'm supporting Roy in his new vision called 1 and 2. If the curve continues, 1 and 2 children born in 20, 25 will have autism. I spoke at a big autism conference recently because this is near and dear to me. I cared greatly about it and I created the program for them, kids because I was very concerned, they would have it given my own background. All right, you're a leader in artificial intelligence. What are you going to do about this. What's the data that we can get because we're not going to get sensors about this but are we plotting clusters of autism. Are we looking for environmental variables there? What were the AI approach to solving any quantities like that look like?
- Steve: Well, I mean, in the case of autism, the theories that I've heard or the ones that seem most believable to me is vitamin D deficiency in the mother, seems to lead to it. The trouble is, once the child is born, you don't have access to that data anymore. Unfortunately, I think in that particular one is probably going to be a longer term process whereas we start tracking and recording, what are the levels of all the important metabolites and vitamins and everything in a mother and what are the consequences down the line. First getting that data I think is a stumbling block at the moment.

Dave: What data do you collect? Do you use specific tools that you recommend for people? Do you have an iPhone app that's cool? What's your deal there?

Steve: Well, I have a funny procedure. I take a lot of different supplements and I don't think there is a very systematic way of choosing what supplements to take today. I did a kind of weird approach which is I would take a single supplement and just let my body see how it felt and then we tried a different one and then a different and then we just started to use intuition. What do I feel like I needed today? Hoping that I'm sort of training my own system to discover the regularities, like, "Oh, when I take this, I feel this way and when I need this, I do this." I don't have a systematic way of dealing with the success ...

Dave: I thought you were a scientist Steve, come on, you got to do the same thing, the same way every single day. Wait, is each day in what you're doing a different variable? I started my path of taking vitamins. You and I probably take supplements. I take a lot of vitamins, people videoed me taking handfuls of them and like, specially when I travel. I'm going to be resilient. I'll take everything that I think works. I started with like rigid spreadsheet. It's like one of this, 2 of these, one of this, 2 of these. The problem specially the problem with multivitamins. When they mix those stuff together is that you're always getting the same thing and if you didn't get enough sleep or you exercise more, you wanted more of this. You wanted less of this.

I arrived at the same place as you, where instead of making 2 weeks of little vitamin baggies ahead of time, I opened my little vitamin cabinet and I pull out these ones, "Oh today, I'm going to skip that one and today, I'm going to take extra of that one." I generally know what they do. The intuition approach seems to work better and more importantly, it prevents your system from getting used to always having the same thing everyday. You can turn off your own production of antioxidants if you're always taking the same amount of antioxidants at the same time, everyday. Mix it up, like mixing things up is a great idea.

Steve: Yeah. Yeah. When you get to probiotics, they're even crazier because apparently in the gut, there are hundreds of different bacteria. Most

probiotic supplements have maybe at most 10, different sets of 10. How do you know which ones do what. Which ones you need, which ones you don't.

Dave: One of the funny things is that the bacteria that thin people have more of and fat people have less of, you can't even buy that. You have to feed it and the way you feed it is with polyphenols. Funny, what's the highest polyphenol beverage that most people consume on a daily basis? That would be coffee and tea and chocolate and bright green vegetables and dark green vegetables and things like that. All of a sudden, you're like, "Wait, is this healthy for me, because there is an abstinence or is it healthy for me because it feeds bacteria that turn off brain fog." People haven't figured that out yet but when you look at things like Terry Wahls Diet, where she was Minding My Mitochondria, which Terry and I agree on so many things even electrical stimulation.

I was just odd to meet her. I highly recommend her book as well which is Minding My Mitochondria. What I would say there is we don't really know all that but you do know when I do these things, I either feel better or I feel worse. One thing that I would love to see people do more of is to track how am I doing. You can either just ask yourself that but the little app on my phone sleep cycle in the morning. How do you feel when you wake up? It gets your heart rate and also, I track like probably 40 things now before I go to bed. I did this, I did this, I didn't do this. I just check this off really quick so I end up having a graph. The data is kind of dirty but it's better than what I had before. I found that that kind of a practice really helps.

What would be really cool and what is happening is when all of that data is uploaded and you mix it together like, "Everyone has honey before sleep. Like, there is a 70% chance that you'll have more deep sleep if you do that. Maybe we should do a double blind trial and do corn versus honey." That kind of thing is possible but no one is going to pay for it, unless it's like a charity kind of thing.

Steve: Yeah. Citizen science and crowd science, I think is ... the other area is, I mean those sort of gross health variables, like how is my energy today, how is my mood, that's critically important really good. What's really,

really important though is our deeper sort of psychological states. Those, most people are not even aware of. I'm a big fan of Robert Trivers model of consciousness. Do you know that one?

Dave: Explain that for the people listening.

Steve: Robert Trivers is one of the preeminent evolutionary psychologist, evolutionary biologist who in the 70s figured out the sort of evolutionary basis for things like sibling rivalry and the structure of the family. He has this amazing and radical of you, of what consciousness is. We tend to think of, our consciousness, the part of us that speaks and connects with the world. That is us. That's the seat of the soul. His view is "No, no, no, no. That's the public relations department of the mind and that it's job is to basically paint a very positive but distorted picture of yourself to the rest of the world." You want to make decisions based on incorrect information. You need another part of the brain which actually knows the truth. You can't let that information leak into the public relations department.

You need this active repressive mechanisms. You get the complex structure of the human mind which has many, many parts. We think of ourselves as sort of unitary beings whereas in fact, we all have multiple parts, some of which come to the floor at different times. Most of us are not even aware of it. There have been these practices, certainly meditative practices or internal family systems therapy sort of treats the different parts of a single mind as members of a family and tries to do sort of family therapy within a single person. That's the sort of idea of that.

Dave: I want to remind people, you are an expert in artificial intelligence, you have PHD in Physics and you're not in that job after what you just said. Okay, I agree with what you're saying I've seen huge results in people from internal family systems therapy. The idea that there is this different virtual machines in your head that are unaware of each other but are fighting with each other, it's accurate. This is what's going on all the time and it's totally invisible to you.



Steve: Yeah. How could it possibly be invisible. Psychologists are discovering more and more things that we think we're aware of but we're not. One I'm really fascinated by is your eyes are always moving around, they do make saccades. These psychologists created a display that when they detected that you're moving your eyes, in one of these saccades, they change the display. Sometimes very, very strikingly like they'll be a red parrot and you move your eyes and they change it to a green parrot. Watching from the outside, this is a major change. From the perspective of the person doing this, their eye movement, they often don't see it. They think nothing has changed. Somehow our perceptual capability has these blind spots.

These things were ... it's very blatantly obvious aspect of reality that we don't ... we're not aware of and we don't even see. I think looking at our own cognitive structure and our own mental ... particularly this business of having multiple parts, that have different goals and different opinions, which most of us are totally blind to that and it requires special techniques and special tools to begin to have awareness of "Oh, the reason I ate a whole gallon of ice cream yesterday was this. The part of me that thinks that's terrible and other part of me that really wants it and oh wow." Tracking that, tracking how the deeper aspects of your mental state are changing overtime, I think that's really the level at which we can ... 26% of the population has a diagnosable mental illness every year in this country right now.

Major anxiety levels, major depression levels, pretty big things on narcissism and sociopathy. We have major, major health, mental health issues going on. The tools for dealing with it are pretty, pretty crude.

Dave: It's funny the self-awareness thing, I've seen as people say, "You know what I am a good and kind person" and then, you turn on me like, look at how you're treating other people, like you're constantly cutting them down. You're in that troll, you're attacking people's credibility and all of this. That's actually not how good and kind people were. If the internal message is I'm getting kind, yet I'm walking around completely unaware, then I'm not acting that way. It's fascinating to me to understand where do the blind spots come from. They come from parts

of the brain that are faster than our conscious thought. We know that those pieces are there.

I'm looking to artificial intelligence and to just data, specially brain wave data and potentially some of the things like from HRV sense, just changes in heart rate variability from minute to minute that you don't normally feel. Those are going to illuminate for us A, that what we're talking about here actually does happen because I think the cat is out of the bag from my perspective, it does happen. Also, B, well, what do you do about it and how do those system work and the more you push on those systems that scarier it is, which is also fascinating because those are there to keep us alive.

Steve: Absolutely.

Dave: Right. When I do like the [40 Years of Zen](#) program with clients, I've never had someone not either throw up or cry in the course of 7 days of having a lie detector say, "No, you're still ... " When they stop self deceiving, what you find is absolutely terrifying. Like, "Okay, maybe that's the same thing that happens in the possum and maybe it's slightly different night in like, I don't know. The data that's coming out of this, where we have hundreds of thousands of people with low cost EEG machines, I have them use headset now. In a few years, I think some of the things that you've already study, I think you've worked on, things that we know worked but we don't know why they work, we're going to have enough data to actually show even more that they work but we're also going to show the underlying mechanisms and that's going to change a lot. Hopefully, not just in the field of marketing.

Steve: Yeah. Exactly. I think marketing will be the first but Doug Engelbart, the man who invented the mouse and he had a vision back in 1962 which is sort of come to be ... there is AI, artificial intelligence but there is also IA, intelligence augmentation. These are tools which help the human sort of come to their best and have greater self awareness through things like neuro-feedback or I've been really fascinated by optical ways of measuring neuroactivity.

Dave: Right. That optical ways, so like looking at eyes you're talking about?

- Steve: No, there was a lot of that but no, using ... actually measuring ... using infrared, LEDs and detectors. They're getting actually much finer resolution than you can get with any EEG system and potentially get headsets based on that technology that could be very cheap and very easy to use without a lot of the complexity of EEG systems.
- Dave: Okay. I'm excited to ... I'm excited to see more about that. The section area, I don't know much about.
- Steve: Yeah. Just has been coming out recently, a team, I can send you some links ...
- Dave: Please do. In fact, I'll post the links of it as well. There is one more thing, I wanted to ask. This is the final question, that's been on every Podcast. I know you've heard of the Podcast. You probably already know the question.
- Steve: Yeah. Yeah.
- Dave: Top 3 things, top 3 recommendations on people who want to perform better. As an AI guy, as a human being, as a guy who lost 50 pounds and as a guy who studied all sorts of bizarre psychological things.
- Steve: Well, I would say, the health things but you already know all of that. Everybody really knows that. I would say, the 3 things which probably most people have not explored are non-violent communication, internal family systems therapy, and bone dialogue.
- Dave: Okay. That's awesome. Those are answers I've never heard before on the Podcast. After 120 something episodes, awesome. Steve, where can people learn more about what you're doing?
- Steve: My website is [steveomohundro.com](http://steveomohundro.com) or if you're interested in the issues around the positive AI, that's [selfawareness.com](http://selfawareness.com).
- Dave: Awesome. Thank you for being on the show today. Totally appreciate it and we'll post links to all of the stuff we talked about on the show notes that are going to be on the Bulletproof site.



Steve: Sounds great. Thanks a lot.

Dave: One of the things that makes you most Bulletproof is the ability to focus. I don't mean, focus for a minute or a few focus. I mean focus for as much time as you need to focus to get the job done. For that, I've trained myself using the Upgraded Focus Brain Trainer and it's available on [upgradedself.com](http://upgradedself.com).

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