

Speaker 3: Bulletproof Radio. A state of high performance.

Dave: You're listening to Bulletproof Radio with Dave Asprey.

Today's cool fact of the day is that we've made some progress on a male birth control pill. They're now making a ... Well, at least I'd say researchers are making a once daily capsule that suppress reproductive hormones in men, so according to this small study anyway it might work. It's called dimethandrolone undecanoate ... undecanoate or DMAU, which is how I would always pronounce it from here on, which reduces levels of hormones like testosterone necessary for sperm production and during the time of the study the 83 men who tried it didn't have problems that come with a dramatic drop in testosterone. Things like, feeling like crap, having no vest for life, losing muscle mass and probably other bad things like that.

I gotta tell you, even though this is a new study, what a terrible, terrible idea because messing with your hormones to control reproduction is one of the worst ideas ever, especially for women who have more dramatic hormone swings than men. Even though we're now working on this, wouldn't it be great to have birth control for men that would be a pill? Yes, if it wasn't a pill that harmed other systems in the body.

Every time I hear about stuff like this, it sort of just makes me want to poke myself in the eyes with pencils because let's not ... let's not destroy hormones in men or women by using, basically potent steroids. There's gotta be a better way for us to do birth control and in fact, I've written some things about this and having written a book on fertility that includes both men and women. What's going to happen if you want to have kids if you've been taking this pill? There's gotta be a better way. Maybe DMAU is it, I just don't think so. This was reported on Science News.

Maneesh: Dave, I've been wearing a bunch of wearable devices for the last few years and I found that that's a really effective contraception as well. It just works.

Dave: That's a fair point. You're listen to Maneesh Sethi and I'll give an introduction in a second. I wear those toe shoes, those five-fingered toe shoes. Those are also very effective form of contraception.

Maneesh: Exactly.

Dave: I wear those around, I got nothing to worry about or weighing 300 pounds also, for me, was a very effective way to reduce my dating frequency.

Maneesh: Natural techniques.

Dave: Yep. I don't know. This is sort of a thing for me. Messing with your hormones in a way that isn't about making you live a long time and feel really good is just a terrible trade off for almost anything and just the entire history of doing that, like, oh look at the increase in cancer risk when you do that in women. Let's not do the same thing to men and let's find better ways to this 'cause if we have the right mindset when we're trying

to solve problems like this, the mindset is, how do we improve quality of life and solve the problem? You come up with a very different solution than had you solved the problem, ignoring all the variables.

Since you guys already heard Maneesh, who is an expert in forms of male birth control, I must say that. Being a friend of his, Maneesh is a founder of Pavlok. Pavlok is a Boston based virtual company now, that makes hardware, software and web service things that helps habit change and you might have heard of Pavlok 'cause I've talked about it before. I think it was a couple of years ago when you were on, Maneesh, but he makes a device and I have one of the first prototypes, that you wear around your wrist that shocks you when you have a bad habit. It's kind of like this idea of snapping yourself with a rubber band, the way your grandmother might have said when you have a bad habit, but much more neurologically interesting to the body. The body doesn't really like these ... they're relatively mild shocks.

If you ever meet Maneesh and he's still wearing that same thing, you could just walk up and push a button you control with your Facebook and he sorta runs around twitching a few times here and there because I think whenever his customer support queue is too big he gets shocked.

What happened was, back in 2012, Maneesh had a productivity experiment. He went to Craig's List, hired a woman to come to his house and slap him in the face anytime he went on Facebook when he should have been working instead, which is an extreme way of dealing with ADD. They have medications for, man. It went viral about that and he came up with this idea that said, "Hey, maybe negative stimulus is part of habit formation," and it turns out there's great, great research that says, "Our bodies respond more strongly to negative stimulus," and even some of the brain training that I do with neuro feedback involves negative stimulus because we're 20 ... I'm making that number up, but 10 or 20 times more responsive to negative stimulus than positive stimulus because negative stimulus might kill you.

You might be able to train away a bad habit by avoiding it more easily than the approach that I often take, which is remove the desire in the first place for it at a low neurological level.

Maneesh started this company. He's a ... He studied at Stanford. He's written a bunch of books and has done a lot of work in psychology and he writes a blog called Hack the System, so he's a guy who's very diverse. Does whatever looks interesting to him, including and I gotta introduce you this way, Maneesh, including tell the judges on Shark Tank who wanna invest that he wouldn't take their money. Did I get that right?

Maneesh: Something like that. Just one of the judges. Just Kevin O'Leary.

Dave: The only one who wanted to invest.

Maneesh: Something like that.

Dave: Alright. Let's start with that. Maneesh, you've got this funky company that's like, I've got a wristband that tracks a bunch of things. By the way, you have your new one out that tracks all sorts of cool things like sleep and what not, but we'll get into that later.

Now you've got national attention and you've actually got a Shark Tank judge who wants to invest and what did you tell him?

Maneesh: When I came to the show, I knew coming in that there was no way I would take any investment from Mr. Wonderful, Kevin O'Leary, the evil looking guy who sits in the middle.

Dave: Why?

Maneesh: The main reason was because of his background. He was on TV saying that three billion people making a dollar a day is a good thing, that it makes them strive harder to succeed and our company is really about redistributing the ability to ... It's like by redistributing resources and giving every single person the ability to succeed and so, for me, I find that when you take an investment, it's never just about the money, it's really about the person that you're taking the investment from and he and I were just not ethically aligned and I couldn't work with somebody who I wasn't ethically aligned with. That was the main reason.

Dave: You told him this on national TV, just for fun.

Maneesh: It wasn't just for fun. I mean, if you watch the show, they do ... I think it was the most viewed ever clip of all time.

Dave: Right.

Maneesh: They definitely took my 50 minutes of filming and cut it down to seven minutes and they make me look quite rude, but I wasn't that rude if you actually listen to the words and don't listen to the zooming in and audio effects. It's actually, I think, very polite how I explained that I didn't want to work with him, but yeah, it came across as me being very rude. I would agree with that.

Dave: Well, reality TV, they do that sort of thing.

Maneesh: Yeah.

Dave: And, he swore at you on the air as I understand, right?

Maneesh: Yeah, he said, "F you, you a-hole. F you." I believe he teared up a little bit, which makes me a little proud.

Dave: Maneesh, you are nothing if not unpredictable. Wait, I mean not predictable. Whatever I'm trying to say there. You pretty much do ... Well, just sense I've known you, you kind of just do what comes to mind. Is that because you're ADD? I mean, by your own

admission, you're pretty darn ADHD. What's going on with that? I mean, was this planned or was this just, you know it just felt like the right thing to do and you just went with what felt right at the time? What drives your decision making on something at that scale?

Maneesh: Well, for that ... That was ... I don't want to say ... It definitely didn't come out as it was planned, but I had known coming in that I wouldn't work with Mr. O'Leary. I don't think I've tamed most of my symptoms of ADD thanks to all the work I've been doing with Pavlok. The kind of design around the company is, I'm trying to build a product for me and fixing my own, what I used to think were problems or disorders, which now I've come to understand are actually super powers when corralled and utilized effectively. Those, might in some cases, make me look like I'm unpredictable, but I think that everything follows along a path. It's a path that's up and to the right with some sign wave diversions along the path, but everything is along the same way.

With regards to investing, so for example, Dave, you're an investor in Pavlok, right?

Dave: Yep. One of the early, early guys. I was like, this is too crazy not to be a small investor in.

Maneesh: Yeah. The reason why is 'cause you and I are ... We're both ethically aligned and we're both aligned on what we believe in, which is helping people get better through bio hacking and through taking control of our own bodies.

For Kevin O'Leary, he's really focused on making money no matter what and for me, money is the byproduct. It's really the effect that we have on the world that is the product and there's just no way I could work with somebody who was like that.

Dave: I haven't seen him. I've only seen your clip on Shark Tank and a couple others, so I actually don't know Kevin. I've never met him, but it would be interesting to chat with him someday.

Maneesh: Someday.

Dave: But, keep going.

Maneesh: A month previous, I was supposed to be on a different episode with Daymond John and Daymond John was on ... I had won the Shopify Build a Business competition that year, so about a month a half before the show aired, I spent a week with Daymond John on Richard Branson's private island, Necker Island.

Dave: Yep.

Maneesh: Daymond John used Pavlok. He got over two addictions with Pavlok. I've met him three times. He's been a huge fan and so, it was pretty disheartening to actually have helped one of the sharks and then the output of the Shark Tank show comes across with me seeming like I'm not a good person or not one with sharks, so it was a really interesting turn of event, but you know-

Dave: Daymond John's a really good human being.

Maneesh: He's a great person.

Dave: He was on this show awhile back and I got to spend some time with him and just a helping person. There's two different kinds of investor/mentor types. There's the people that are motivated by making positive change happen and they'll help you whether there's something in for them or not. If there is something, great and there's other people who are like, "What's in it for me," all the time.

Maneesh: Exactly.

Dave: I mean, everyone out there, if you're every working with investors or just a mentor or adviser, you want the people who just get joy from helping and the people who know how to make money 'cause there are people who everyone and never make a nickel and then they're actually not helping themselves because if you're ... If you know that your next meal is paid for, you'll probably be a more helpful person and I believe that that's true in all of society. We've got to handle those basic needs.

Maneesh: Absolutely.

Dave: Okay. Alright. Now, you've been running a company for four years and you first started out with this, we're just going to say, create a unconscious neurological fear response to things that your body believes are satisfying. Things like checking Facebook all the time or basically, bad habits, and that's a very potent technique, but I think you've evolved a little bit since then. What's your take on motivation and habit formation? Where's your head now?

Maneesh: Sure. At our core, our company has got one core statement that we say every day and our mission is to upgrade humanity and we do that in three ways. The first way is to break the habit. Break the bad habits that hold us back. The second is to form the good habits that make us who we could be and the third is to add subconscious knowledge by converting digital information into subconscious sense, letting us learn faster and become super humans.

Those are the three things that we focus on as a ... This company is an 80 year company of my life plus hopefully it'll last ... outlive me and so-

Dave: You're only going to live to 80?

Maneesh: 80 plus years. I'm 30 now, so I'm going to 110 minimum, but I'm sure by then I'll have my consciousness inside of a machine that can live forever, God willing.

Dave: You're one of those brain upload guys. You and Aubrey de Gray. I tell ya. You're already uploaded, man. Just figure it out.

Maneesh: I believe we live in a video game, but that's a whole different conversation. No, the way I look at it, you're asking me about motivation.

Dave: Right.

Maneesh: Early on in the beginnings of Pavlok and actually before I started Pavlok, I was a big habit formation guy. What I did was, I focused on helping people achieve positive habit formation and forming a habit and breaking a bad habit are two different things.

Dave: Yes.

Maneesh: I found out why do the slapping post and then a bunch of different experiments with our users that the best way to get someone to start doing a good habit was by adding a negative reinforcer, so if you add a bet and say, "I bet that I'm going go to the gym every day for the next 30 days," or you have a punishment like, "My phone will shut off if I don't go to the gym," it becomes very easy to get people to start doing a habit, but then by rewarding them as they do that habit, so you start off with a bet and then when they get to the gym they have friends there, they are start to feel good, maybe they listen to an audiobook every time they go to the gym. That habit becomes permanent. It starts to stick. Negative reinforcement starts the habit. Positive reinforcement makes it stick.

When we first started off with the Pavlok product, the idea was driven by that goal of helping people break bad habits and form ... Helping people form good habits. Very early on in the Pavlok days, we discovered the science of aversion therapy. Aversion therapy was a pretty common way to quiet bad habits in the 1960s and 70s and 80s and basically what it was, was if you wanted to quite smoking or quiet nail biting or quiet negative thoughts, you would go to a therapist, the therapist would have you do the behavior on purpose, like smoking a cigarette while self-administering a zap at every puff of the cigarette.

What would happen is, just like a Pavlovian dog or if anybody has ever gotten really drunk off of a tequila, for example, and gotten so sick they never wanted to drink tequila again, it creates a Pavlovian association in the basal ganglia reptile part of your brain. This one night of over drinking and getting nauseous can lead to never drinking that alcohol again. When we discovered that and we started looking at some of the old studies on aversion therapy, we were finding results above 50% cessation in less than a week.

People trying to quiet smoking or quiet nail biting or quiet eating sugar would follow a five day protocol and a year later, fewer than half of them would have touched a cigarette or would have bitten their nails and the numbers are ... those are astronomical numbers. We're talking about the difference between 7.5% effectiveness when you use nicotine patches every day for six months versus 60 plus percent or 50 plus percent success rate on quitting smoking after just five or six days of being zapped.

When we saw that happening, we were like, "Whoa. That's a big deal and no one in the world is solving bad habits or addictions at speed and scale and we can do all of them in

one fell swoop." We decided to double down from 2014 until early 2017 to double down on bad habit cessation and we've gotten very at it. Right now we've helped thousands of people quit smoking, quit nail biting, quit unhealthy eating. Those are our big ones. Sleeping in is the number one by far, which is hitting the snooze button.

That is what we started off with and now, recently, we've begun to bring back in the forming good habits section. I learned very early that in order to form a good habit, you need a positive reinforcer and to me, it was pretty simple. We should be rewarding people with a point system or a currency or what would eventually become a crypto currency in my mind. We started giving people a digital point system, digital currency that we call Volts.

The way it works right now is when someone commits to a new habit, they simply put down a bet. They bet between one and 10,000 Volts a day and every day that they actually follow through with their behavior, they win back their gamble and they win Volts from the people who failed and we've created a pretty elegant 85% plus success rate on people who are forming new habits, which I'm pretty proud of.

Dave: That's pretty legit. I look at energy because it is something and right now, a certain amount of energy in your brain goes into a craving or a desire, like let's say it's for a cigarette or you have this unclingable desire to bit your nail, whatever it is. Then that took some neurological ... that took electrons for the urge to happen. Now, my preferred approach on many habits, but probably not those two, is to say, "What's driving the habit? Let's change the pattern recognition system. Let's edit the code, so that the urge isn't there," which then requires the least amount of electrons to made in your mind.

What happens is, the urge comes and then after the urge you get a fear response because the body's like, "Oh, every time I feel that urge, I got shocked." Now, isn't that going to take twice as much energy? All throughout the day, every time you think about smoking you get a little surge of cortisol 'cause your body's like, "Oh, get ready to get a little electrical thing."

By the way, we should just tell people, we're not talking about a stun gun here.

Maneesh: Oh yeah. It's like the rubber band on your wrist. Like the snap of a rubber band.

Dave: It's a small thing. It doesn't leave a mark or anything like that.

Maneesh: And it's programmable.

Dave: It's mildly uncomfortable, but it's enough to get your attention.

Maneesh: Yeah. It's like any sort ... Basically, the body responds and the brain responds a lot more to the possibility of loss or the possibility of punishment than it does to reward. It's called loss aversion. You definitely have seen that people will not want to loss money more than they want to gain money, but the training period is only five to seven days

and then it's followed up by nothing. The craving just disappears. It's kind of like when you're a child and you know how you probably ... When you were fatter, whenever you saw a burger, you wanted that burger and you thought about the burger and if you didn't have one, you'd think about it.

Dave: Sure.

Maneesh: Probably now, now you just don't think about it. It just doesn't cross your mind. In the same way, that's what happens with the cravings for nail biting or smoking. It just doesn't cross your mind anymore. It just disappears, which is the beauty of it.

Like you said, obviously, getting rid of the trigger is always a smart idea. Getting rid of the trigger and adding that response of the zap for the training period, followed up by continuing to add that zap for a few days after the training period is complete kills the habit dead in the brain. It just ... You just don't want it anymore. It's a really, really interesting response and it's hard to explain, but once you've gone through it ... If you've ever made a bet about something with a friend, you know how your mind just won't stop thinking about it until you've won?

Dave: Yep.

Maneesh: It's like if you say ... If you commit to going to the gym or you commit to doing something for your boss, you just won't stop thinking about it until it's done. That's what happens. It makes you much more aware of your thinking process. No longer do you just automatically find your nails inside of your mouth if you're a nail biter, but you just become aware for the first few days that it's happening and then slowly it just disappears and that's kind of the goal we have, which is silent habit change.

Dave: Interesting, so your assessment of this is that the urge stops, so they basically cancel each other out rather than it being more of those the urge always happens, you always get a resistance.

Maneesh: Yeah, it's much, much faster than people who try to use nicotine patches, for example, but they still crave that habit of going outside and taking a break and moving their hands up and down towards their mouth. That desire goes away, but we also teach in our course, it's not just a zap. There's a cognitive behavioral therapy angle of the teaching of how to do it. We teach you how to meditate, focus on pain, and focus on the success, then focus on moving your hand away from your mouth and onto your right leg. Move it away a few times, so you start to replace the habit with ... You'll see our users start to bring their ... like on day three or day four, they'll bring their hand to their face and naturally their hand just does this motion where it goes into their leg 'cause we teach them to do that, and it become kind of automatic. It's pretty cool.

Dave: Okay. I'll buy that. I did have the device, but I was like, "I don't have any habits."

Maneesh: No, you're perfect.



Dave: I don't have any left that I want to break. I was like, "What am I going to work on with this?"

Maneesh: You're level two or level three in our upgrade humanities paradigm, I suppose. Form good habits and increase subconscious knowledge.

Dave: Yeah, and there's also something about where habits are unthinking things and what I'd like to do is build more awareness, where I have choice, and I have that it as something that's made without choice, so I tend to focus on algorithms, where I'm going to chose to do that, and I've found the very best thing. I don't pile the dishes in the sink because then I have to move the damn things to use the sink, and it actually is a huge waste of life, so I put them next to the sink and then when I want to do them ... It's not a habit, it's a best practice for saving time in the kitchen.

The different between a habit, which is an unthinking thing you do, even if it doesn't serve you, and an effective algorithm that you do because it works best, and you do it without ... it's just somehow different then a habit. Do you come across this in your work at all? That mindfully choosing to do something is a best practice versus having a habit, where you do without mindfully choosing to do it.

Maneesh: Yeah, this is like unconscious competence that becomes conscious competence or vice versa. It's unconscious incompetence becomes conscious competence when you start to be mindful of it, but if you do that behavior for enough days in a row, it becomes unconscious competence and that's the act of habit formation.

Maybe a tiny bit of background on habit formation would be really interesting to your users.

Dave: Yeah, let's talk about that.

Maneesh: Sure, so I gave a keynote talk at the World Society of Medicine once on how to form good exercise habits in the brain and what it was basically focused on was the models of changing behavior one time and the models of making a habit, which combined together created our model.

Forming a habit, people have given you the fundamental ... there's only one variable in forming a habit and that variable is consistency. If you do an action several days in a row, eventually you reach what's called the maximum level of automaticity, which is when it's harder to not the habit then to do the habit. A good example of this is brushing your teeth. I'm sure most of your listeners and probably you, debatable, brush your teeth each morning. Just kidding.

Dave: I replace my teeth with nanobots.

Maneesh: Exactly. Good way to do it. If you don't brush your teeth, if you leave the house without brushing your teeth, you feel this weird kind of sensation in your mouth and that sensation isn't real. The human species have been around for over 70,000 years and we

didn't have tooth brushes for more than 69,100 of those years. We just got toothbrushes recently and somehow, if you grow up brushing your teeth and you don't brush your teeth, it just feels strange. That's what a habit is.

A study out the University College of London decided to see how long does it take to form a habit? They let several dozen other people do a bunch of different habits and they measured how long it took before it became automatic and they found that a simple habit, like drinking a glass of water took about 21 days to form a habit and a difficult habit, like doing 50 sit-ups after breakfast would take something like 84 days. The average was 66. When you hear those numbers, that it takes 21 days to form a habit or 66 days to form a habit, it all comes from this study.

What they found, basically, was that how difficult the habit was, was directly correlated to how long it took for that habit to form. I broke that down into how we make it so that the 50 sit-ups is a lot of sit-ups to do, but one sit-up is actually not that hard to do. What if we could break down a long, very difficult habit into its component parts and then help people by layering those habits slowly, one on top of another.

We did this by ... We did a gym challenge where we took people who wanted to go exercise every day for 30 minutes and we basically ... I think there were 200 people in our test cohort and what we did is, we said, "Okay, for the first week, you simply have to go outside in your gym clothes and lock the front door and send a photo of yourself in your gym clothes. The second week, you have to lock the front door and swipe your gym card at the gym. The third week you have to spend 10 minutes there. The fourth week, you have to spend 30 minutes there."

We had a Facebook message group for each of the people doing these competitions and if you do do it every day in a row, at the end of the week you get to buy yourself a gift and if you don't do it, you have to pay \$50 to your other competitors. We made it so you would ... If you didn't just simply go outside in your gym clothes and lock the front door, you'd have to pay 50 bucks. We made it so the act was so easy to do, you couldn't fail and so stupid to fail, why would you? We had, I think, about 100% of people did the first week and by the end of the month, we had a 80% success rate on people had followed through with every single one of those steps. They'd slowly built up to the full habit they wanted to do.

At that point, we ended the bet challenge and we just continued to monitor and see how long they maintain that habit and 80% of those 80% of the people maintained the habit for the full 60 days and another 80% of that group maintained it for 90 days. It was above 50% of people went to the gym 90 days in a row and all they had to do was go outside in their gym clothes and lock the front door. That was kind of the understanding for me about how habit formation is created. The best way to form a habit is to break down your habit into its component parts, build up to the goal of a habit and add a disincentive, specifically for that first month to make sure that you actually achieve that first month then it become autopilot.

Dave: It does make sense. Now, I'm a little concerned ... I used to really be into this and for disclosure, I used to also have OCD in addition to ADD and the whole Asperger's thing

going on, but I was like, You know, I keep forgetting my keys," so I just developed this habit where every time I'd leave the house, I would check my pocket for my keys. I would just rub my hand over my pocket to make sure that they were there, so I didn't get locked out anymore and I could always get into my car. It was really effective, but then I found I was checking like 100 times a day to see if my keys were in my pocket, just unconsciously. The problem with habits is that unthinking part of the habit. How do you know that people are installing the right habits and that they're doing them the right amount?

Maneesh: That's our goal with the Pavlok app. We monitor as much as we can and we're trying to build the perfect model to build the perfect human, but that's a process that takes a long time, right?

Getting people to ... If your question is more about how do we make sure people don't overdo habits, my answer is, people set goals for themselves and if they achieve it, we consider it a success. If people accidentally go to the gym twice a day, rather than once a day, I consider that a success, but then if people want to reduce that amount of time they do something in the same way we'll let them commit to that goal and that's what the zap is for. We're helping you reduce the desire to do stuff.

There's also, the way that you're describing it regarding keys and double checking your pocket, I think most people do that. They check for their phone and they check for their wallet when they get up, often when they leave places, otherwise they would lose it. Those are habits that I find to be better to have more of than less of 'cause the downside of not checking your keys all the time is that you checked your keys a lot in your pockets, but the upside is you don't get locked out of your car or your house. Those are ones that it's a little okay to overdo, whereas, other habits like smoking cigarettes, for example, obviously the downside is much larger than the upside. That's really a decision or way you frame it.

Dave: I've got it, so you're saying these are low cost habits, so it's okay to overdo them?

Maneesh: Yeah, but also that's not something that we're not ... Our number one habit isn't checking your keys before you get up, right?

Dave: No, you're trying to break bigger habits.

Maneesh: We break ... Again, breaking and forming are different. Breaking a habit is much different. We're talking about breaking habits like sleeping in, things that are causing people to not get their work done, not get to work, so many narcoleptics we have who have just never been able to hold a job. Nail biting and smoking, things that are killing people or making them have extreme social shame. Hair picking, trichotillomania, which is extreme, which is very socially shaming. Those are the habits that we focus on breaking, while the positive habits we help people form are related, right now, gratitude journals, fitness and ... well, gratitude journals is our biggest one right now.

Dave: Let's talk about sleeping in and about gratitude.

Maneesh: Sure.

Dave: Now, if you sleep in so much that you can't have a job and you're a narcoleptic, that would be a big problem, no doubt about it. That's a habit you gotta break, but I'm not convinced that leaping out of bed, instantly the second you wake up is necessarily a good move either.

Maneesh: Neither do I.

Dave: Have you looked at the downside of leaping out of bed because your body learned if you don't do it you'll get shocked?

Maneesh: I absolutely have looked at our users, but then again, we should take a step back. We don't just shock our users out of bed if they don't want to be shocked out of bed. We have a program that lets users program in their goals, so let's say they simply want to wake up in the morning and be out of bed by a specific time, they chose the stimulus pattern, so it starts off with a vibration. They have about 30 to 45 seconds before that increases to a beep. Then there's 30 to 45 seconds before that increases to a zap. That's the default program. We find that most users will wake up and be alert by the vibration or by the beep, so that they never actually get zapped. We also let users just simply program in vibration alone. That's like a silent alarm. There's no zap at all, whatsoever. Then there's the zap, as well, where some users just love being zapped alert right in the morning.

All of these are integrated with our sleep tracking system, so we're able to identify your stage of sleep and we begin the alarm in your light stage of sleep, which really helps people wake up.

Dave: That's one of the most life changing things that you can do and I've been doing that sort of thing for now almost 10 years. I was one of those people who would definitely sleep in. I'm a wolf is my chrono type, which means that I'm one of the 15% of the population who's genetically adapted to taking the night shift. Someone had to watch out for night predator when everyone else was asleep and that's me.

This is why I like to say that there's no moral superiority to waking up early or staying up late-

Maneesh: Absolutely.

Dave: It's actually ... It's biological.

Maneesh: Absolutely.

Dave: It's also why I like to say the early bird works for the late bird, but hey, that's just me. The idea is, waking up at the right time for your biology does have, we'll call it moral superiority. At least, it's a really good habit to have.

Maneesh: Sure.

Dave: But, I did have times in my life where I would ... I've slept through classes and I might've been late to work more than a few times and I've had that-

Maneesh: Or your plane flight, right?

Dave: Yeah.

Maneesh: If you've got a flight.

Dave: Yeah, missing flights and things like that, but I haven't had those problems in years, but one of the reasons is that what you're doing with your system is waking up at the top of a sleep cycle. What I found after I started getting data from my sleep ... This must have been ... Geez, circa 2008 or something, I started doing this. It was like, "Oh wait, if I wake up when I'm at super deep sleep, I feel like a ... I'm like a zombie and a jerk all day," or if a two year old ... when my kids ... They're older than that now, but if they'd come in and just jump on you when you're completely way deep down in sleep, it was like ... it was hard not to yell and just be like, "What just happened?"

What your system is doing is you're saying, "Wake up in this window, so that it's a gentle waking not a shocking asleep."

Maneesh: It depends on what the user wants.

Dave: Okay.

Maneesh: Of course. Our goal is simply to make sure that the user achieves the goals they set for themselves. I don't have any moral quandaries or standards here. It's that the user wants to get up by this time, if he has a very important meeting in the morning, then he'll set the zap.

Dave: Okay.

Maneesh: If a user simply wants to wake up silently because it's feeding time for his child and he doesn't want to wake his wife, then he'll set just the vibration alarm.

Dave: Okay.

Maneesh: But, what we have found is that for many users, especially a lot of users who think that they're night owls, I found that it's often very simple to make that change. Whether or not you have genotype or not, a phenotype is obviously the one that's ... Not every gene is expressed.

Dave: Oh yeah.

Maneesh: For many night owls, at least self-proclaimed night owls, we found that they simply would wake up and hit the snooze button 10 or 20 or 30 times in bed and that that wasn't good for them. Whether or not it was their built in genetics, it just wasn't what they wanted with their lives.

Dave: That's someone who's sleep deprived, if you need 10 plus of those things.

Maneesh: Yeah, but it also becomes a habit. It becomes a habit for so many people that they just get used to it, whether or not they sleep eight hours or six hours or four hours. Maybe their chronically deprived, I would not debate that, but they just continue ... They get used to being okay with hitting the snooze button and so, they continually hit the snooze button, whereas, if someone wakes up and shakes them out of bed, they will get up.

We want to help those people who are trying to get rid of that snooze button habit. We find a lot of couples are the ones that we help.

Dave: Oh yeah.

Maneesh: That we're very, very good at, first of all, making sure that they wake up and get out of bed, but also, secondly, they don't actually have to experience the zap very often because their brain starts to recognize that a vibration means a zap might come soon and so, they'll actually wake up alert to the vibration well before the zap.

Dave: I definitely have noticed just through years of my marriage, I definitely will use the snooze button pretty much one to two times every morning on purpose because there's this interesting twilight state if you wake up at the top of the sleep cycle where new ideas come and you're not quite awake, you're not quite asleep and that's basically riding right between theta and alpha state in the brain and if you do that and you wake up and you write down what you remember, really good stuff happens, but you launch out of bed, you don't do that, but if you'd snooze 20 times, you don't do that either.

It's been a quantifiable, very noticeable change in the quality of how I treat other people during the day if I get to wake up at the top of a sleep cycle and I get 10 minutes to just slowly come back up, but I could see the benefit of saying, "After that 10 minutes, the warning comes," that would be life changing at the times in my life when I've been stuck where I'm going to miss something important because I didn't have the control or the awareness or I don't think it was a lack of desire, but whatever it was, something wasn't working right and I would just sleep, sleep, sleep and then two hours later, oh I just missed it.

Maneesh: Especially when you wake up in a deep sleep mode, you'll notice that if you look at it under a brain scan that the reptile part of your brain is heavily active at that time of the day, and it owns you, you know? It owns you, especially in the morning. Especially, at that exact moment of wake up and so, if you wake up in your lightest stage of sleep, it's a lot easier to just wake up and not be controlled by your brain, but instead have the control to do what you think is right for your brain and that's really what it's about. It's

about giving people back the control of their own behavior and not being owned by the triggers in the environment around them.

Dave: That not being owned by the environment around you, that's quoted by Al-Hakim. The idea of, if I can change the environment around you and-

Maneesh: Exactly.

Dave: And inside you, so your body's what you want, but you also have some sort of fatalistic beliefs, like you once said, "I've always been doing what I do. I'm not in control of my actions. I have very little belief in freewill. I'm a behaviorist." I mean, on one hand you say you don't believe in freewill, on the other hand, you're saying, "Use this tact, have Pavlok help you wake up, which allows you to exercise freewill over yourself." How do you-

Maneesh: I don't think I've said those words. I'm not sure if you're putting words in my mouth.

Dave: It's a direct quote. I wrote it down.

Maneesh: I might have said, freewill in the sense of my philosophical beliefs relating to us living in a video game, but that's-

Dave: Oh, okay.

Maneesh: That's a different standard. I believe this. I think that ... I know that between 40 to 60% of our day is spent in automatic mode. Spent in the reptile part of our brain where we have no knowledge or control over our behaviors. Kind of like how, in the morning it's really easy to say, "When I get home from work I'm going to do these things," but then when you get home, you end up vegging out and watching Netflix because whatever your habits are formed as you go through the day, you get more tired, you get home you just simply tend to do what you've done, but in the morning and at specific periods of time in a day, you have these blistering periods of prefrontal cortex activity. These periods of freewill in your phrasing.

These periods of decision making capabilities, those are times where you can make massive adjustments to your environment, to set up yourself for success. Have you ever heard of the rider and the elephant metaphor for your brain?

Dave: The one where the people touched different parts of the elephant, they don't know what it is sort of thing or something else?

Maneesh: No, it's like if you think of your habits as an elephant and your consciousness as a rider, it's like the rider can tell the elephant where to go, but if the elephant decides he wants to go across the street and get some peanuts, he's going to cross the street and get some peanuts. The rider can't stop him, right? But, what the rider could do is change the path earlier on, making sure that there no peanuts on that road that he's going down.

What I've found, at least for myself for the hundreds of users we're using our betting system with, our commitment engine, is in those periods of commitment you can set a goal or a noncheatable bet that changes the conversation and actions of the reptile brain. A good example here is, the betting thing I told you about with the fitness or the gratitude app that we have in our app, so at the moment of high motivation, you're able to say, "Yeah, I commit to going to the gym. I'm going to put money down on this," or "I'm going to put Volts down on this," and at that moment you've now created a noncheatable environment that your reptile brain will respond to when it's in control.

Those are the small little periods of freewill that I think I have in my day-to-day routine. I optimize by setting a bet that I can make sure ... That I know I will commit to because my reptile brain doesn't like losing bets, so that's how I see the brain. Using your periods of awareness in order to create a new contextual environment that your reptile brain is likely to follow through with.

Dave: Do you believe that the reptile brain is a separate consciousness from our consciousness?

Maneesh: No, I don't think it's conscious. I think that consciousness is a byproduct of billions of neurons that evolved over billions of years and I don't think the reptile brain is anything different. There's no physical difference ... Well, there is a physical difference, but there's ... it's interconnected. It's much ... It's very interconnected. There's a great book on this called, Why Everyone Else is a Hypocrite and it talks about how there's not one brain, there's not three brains, but there's billions of neurons that all evolved over billions of years in order to exist and that they all work in a very interesting pattern just for the selfish gene continuing to exist and that they're not different beings within you, that's just a really good model that allows human beings to ... or allows me to understand how I act most of the day. At the end of the day, it's just billions of interconnected neurons that all do stuff.

When I think about consciousness as a byproduct, there's a really cool study where they wanted to see if when you make a decision, like you say, "I'm pressing the button." If you say, "I'm pressing the button," and you press a button at the same time, and brain activity occurs at the same time, that probably means that consciousness is the first step in a decision making process, but vice versa, if the scientists were able to see brain activity light up before you said, "I'm pressing this button," then probably there was some kind of interaction going on in your brain that happened before the conscious brain got wind of it.

They expected to see somewhere between, I think, 200 and 400 milliseconds of gap before wise, I think they found two seconds. Two full seconds where the brain made the decision before the conscious brain said, "I'm making the decision," and I found that very insightful.

Dave: Yeah, that's a core part of some of the stuff that I write and I talk about, is that your body knows all sorts of stuff and makes all kinds of decisions that you ascribe to yourself that actually won't make your decision, but there are other times where you actually make a decision and then the body follows.



Maneesh: Sure.

Dave: The path to becoming a better human being is making more of the decisions that your body follows.

Maneesh: Exactly.

Dave: And listening to what your body tells you and then deciding whether you're going to allow it to make that decision or not.

Maneesh: 100% agree.

Dave: That's what every meditation practice on the planet is basically teaching you to do at some level and it's interesting when you start tying devices and whether it's neurofeedback, whether it's just basic movement detection, sleep detection with respiration and heart rate, heart rate variability, all the things, a lot of which you've built into your device, all these are ways to short circuit some of what you would learn sitting in a cave for 20 years outside a monastery somewhere.

Maneesh: Totally.

Dave: It's just the signal makes it a lot faster.

Maneesh: Absolutely, and I think that one thing that kind of becomes a misconception with Pavlok is that we're not a meditation device, we're not an awareness device, and the part that is ... Maybe we should focus more on this in our explanations, but when you had a zap, you know when you're in your day-to-day routine and suddenly your child jumps on your arm or yells and suddenly you become aware and snap out of whatever you're doing?

That's a moment of awareness. That's the prefrontal cortex activity and a zap simulates that touch on skin, that touch that makes you aware and so, what Pavlok's goal is, is really to knock you out of automatic mode and bring you into the present and in a lot of ways, especially if you test using it with the muse device, EG device that tracks your brain ... Your EG levels, it gives you a calm score. If you zap yourself ... You know with meditation, you try to bring yourself back gently to your breath? I started adding a zap when I lost focus on my breath and my calm score instantly shot up. It became more aware and it quieted my reptile brain or my anxieties and brought me into the present allowing me to control my focus.

Dave: It's funny, one of the forms of neurofeedback that we use at Bulletproof Labs in Santa Monica is you're listening to this really nice, relaxing music and then as soon as your brain starts to lose focus, going to another state, even if it's a state you want, just whatever state it's in, the music gets static and it's irritating.

Maneesh: Exactly.

Dave: Just that minor irritation just tells the brain, "Oh, I guess I should pay attention to where I am now," and if you go back to more of the Japanese style of zen meditation, you're sitting there, you're meditating and if the mediation teacher, usually a monk of some sort notices you losing focus or your meditation, they'll hit you with a stick.

Maneesh: Yep.

Dave: Not hard enough to cause damage, but it's like, "Hey, pay attention." That thing is ... It's actually really powerful thing, and it maybe missing from a lot of meditation practices, where I'm just kind of sort of be half asleep and all this, but there's also a downside risk to this, Maneesh, and it's always been my biggest concern as a supporter and investor, is that if you build too much of the automatic flinch response into meditation, into habit formation, all that, that can also become neurologically expensive because then it's almost like a little bit of trauma every time. Like, oh I can just ... Nope, I can't.

The challenge for you and I think you've elucidated this pretty well in this interview, but the challenge for you is making sure that you achieve that middle ground where you don't create more automatic responses to avoid trauma or to avoid bad habits then is beneficial. Do you have control systems in place for that?

Maneesh: 100% Number one thing is that zap is not the core of Pavlok. Zap is one of the stimuli, so vibration patterns and auto sounds are used far more than the zap. In the same way if you want to train a dog not to run outside of a area, you don't just zap the dog every time he runs outside the area. You start by vibrating and then beeping and then zapping. It's building up to a neurological response. You don't want to just simply throw them into a zap. It's not ethical and it doesn't work very well.

The first thing there is that a zap is a last resort. It's not the core of the product.

Dave: Okay, so it's gently guiding you back into awareness when you're following a bad habit or you're not doing what you told yourself you were going to do.

Maneesh: Exactly.

Dave: So, you're unconscious behavior percentage drops and the zap is ... Your body knows it's there and it ... Maybe the awareness comes before the ow comes.

Maneesh: Exactly. Exactly. 100% true and in the same way, it's just that when people make commitments with no disincentive, if they say, "I'm going to go to the gym this year," but there's no cost if they don't go, a commitment without a penalty is not a commitment, it's a nice to have. W

What happens is, is that people never stick through with their New Year's resolutions and they never stick through with their goals, but if there is a slight disincentive like, if I don't go to work, I'll be fired, what happens is, they first of all, go to work and then, over time, they start to enjoy going to work. They get used to the path, they get used to the drive, they have a social relationship at that job and it becomes a habit. A positive habit.

Like I said at the beginning, the act of habit formation is not shock you when you're bad, it's, zap you or let you know you might be zapped if you don't get started, but once you get started, help guide you to keep you with positive reinforcement as you do positive behaviors to make the habit stick in a positive way. It's just a tool. One of the tool stimuli in effects is a punisher, but majority of it is focused around positive rewards.

Dave: I'm going to put on my dystopian hat here.

Maneesh: Sure.

Dave: Let's say you're running a giant social media company and you have the ability to have people wearing these devices, the original Pavlok actually locked on our wrist.

Maneesh: The idea was, yeah.

Dave: Exactly, it's why it's called Pavlok instead of Pavlov. Okay, so anytime someone doesn't check their social media every 30 seconds, you're just going to warn them ... There are governments around the planet who are ... They're getting to the point where they can track everyone, all the time. They know exactly where you are, exactly what you're doing and probably wouldn't be adverse to using this kind of tech. Do you worry about the downside of building habits that are not self-serving because someone else has control of the tech?

Maneesh: 100% I worry about this all the time and like I say all the time to people, "If anybody else was building Pavlok in a similar system, I'd be very worried about it," so I have to build it so that they don't do it first.

I'm a pretty chill guy. I'm not here to try destroy the world. I'm here to help people get control of their behavior and upgrade humanity as a whole and to me, that is extremely important and so, there's obviously ways that you could take the idea of zap that is remote controlled or automatic and convert it into a dystopian world and in order to stop that from happening, it's really important that we stay ethical, that we stay decentralized and democratic and that's a very, very core part of our mission and our vision.

Getting people the capability to control their own behavior, not some third party who's watching you controlling yours.

Dave: One of the reasons that I named this movement, this community bio hacking is that I'm literally a computer hacker by training. Computer security, cloud computing and all that and the role of hackers has always been to say, "Well, I can do this myself, instead of seating control to someone else," and the original thing was Linux, this open source operating system, which is now built into huge numbers of things. As a matter of fact, I guarantee you that ones and zeros that our conversation flowing back and forth to each other are flowing through Linux based systems and Linux is cool because you could see all the code, versus say, a Microsoft or any of the other big closed sourced companies where you couldn't actually tell what it was doing and so, what hackers do is they say,

"Well, we're going to build a system where we know what's going on inside because otherwise, someone else will build a system and they know what's going on inside and they set it up for their own interests.

When I realized, because of the annotation, where you search that I've been doing just for a long time in a nonprofit, like wait, there's all kinds of technologies that affect our brain state, effect our behavior, affect how long we're going to live, how much attention we have and all those things, we know that they work. Different pools of research from different disciplines know this, but they haven't been pulled together and if we don't do it as hackers who say, "This is our birthright. This is something that's ours," that they will be taken up commercially. They'll be taken up by governments and what ends up happening is, they'll build systems that meet their goals, not my goals.

We have this duty as human beings-

Maneesh: Exactly.

Dave: To be able to look at the source code, to be able to know what's in there all the way and one of the problems with social media right now is that no one knows what the algorithm do and we have this whole industry, like SEO optimization and social media marketing, which is all about guessing what's inside this incredibly complex rule set knowing that they change the rules as soon as we all figure it out and this is one of those problems where, how are we going to solve this, and I think hacking is the only way, which means, well, we build systems where we know what's going on. Do you open source your patters? DO I remember something about that?

Maneesh: 100%. We open sourced all our patters. Anybody's allowed to make their Pavlok if the want. We provide ... All of our code is available on demand, on request and our goal is to create an open source platform for behavior change, so everything is about transparency and about the ability for anybody to know what's actually going on.

A lot of this is done through machine learning. A lot of this is done through automatic coding, so it's not just hard coded in. It's designed to learn, but it's designed to be open. Specifically, like the vision of Pavlok is very much ... The hardware device Pavlok is a step. It's the first step in the grand vision, but our big vision is about creating a new economy. We have a digital currency called, Volts, which will be a crypto currency, which is created mind by doing healthy habits and that that's ... It's about, basically, being able to distribute resources to people based on doing positive things for themselves, not about getting paid by what other people want them to do, but instead, getting paid by committing to the goals and achieving the goals that we set for ourselves.

The entire vision and entire ethos of Pavlok is not about someone else controlling you or someone telling you what to do, it's about giving you the power and the rewards to be able to do what you set for yourself.

Dave: That ... It makes sense on its face, and I think we are up for the next 10 years of pretty interesting stuff happening, especially in different regions globally. Some areas of the world are very open to new technology. Even go back to ... As far as 2003 when I first did my first stick on heart rate monitor. We couldn't do any of that in the US because it was going to cost \$50 million or something, so we did it in Singapore and Medcity in India, so we have these pockets of innovation, but all of those areas where those pockets of innovation are also open to some pretty weird stuff happening if the wrong people are running the tech that sets these algorithms for how we behave.

Maneesh: Totally agree.

Dave: I remain hopefully that good things are going to happen, but I'm also a little bit skeptical just because there are people out there who will not use all these bio hacking technologies for our own ends. They'll use them for their ends and it's a level of power that we haven't had as human beings over other humans.

Maneesh: I completely agree and I hyper respect having people who are skeptical who surround me. It's one of the most important things for making sure that we stay aligned with our longterm goals.

You should note that a lot of what we're trying to do is by bringing power back to the individual, so for example, we won't be allowing the device to be controlled by anybody unless you give access to it, for example. Our coding is built on the individual holding the controls. The individual having the ability to set commitments and stick to them, but if an individual doesn't like what they're doing, they're stuck ... they're beholden to their own commitments, but they're never beholden to the commitments of somebody else, and that's a very, very important part.

Dave: It's such a slippery slope, though. I've been looking at employee wellness for a long time and let's say that you're wearing a Pavlok and it gets all sorts of data, like heart rate variability, and things that are good measures of how you're doing biologically.

Now, if your employer says, "Well, I'm only going to pay for your health insurance if you give me the data." At a certain point you're like, "I guess I'm going to give up the data," and then the next step is, well, we'll give you a bonus-

Maneesh: That's what we want to stop against. It's what we're trying to stop from happening. It's not about employers buying you the product. It's about the product. The key here is this Volts crypto currency.

Dave: Okay.

Maneesh: In this currency it's a currency that's created by the individual, so it's actually created by an individual sticking to what they commit to and the money come ... The longterm vision within 10 years, so medium term vision is that any person, anywhere in the world who sticks through with their daily habit, say walked 10,000 steps a day earns the equivalent of \$30,000 a year. The American average salary. Whether you're in Africa or

America, our goal is to get complete distribution to everyone in the world and allow any user, anywhere in the world to be able to, whether you're an American or an African to be able to earn the same amount of, what would be about 30K in the US ... against the US dollar.

That vision is pretty complex and you can learn more about that at [pavlok.com/volts](http://pavlok.com/volts). The details are there, but the basic system of it is around you committing to yourself by replacing the need for a currency that's owned by your employer or owned by your government and instead creating a currency that's created by yourself. This is the ultimate vision of what we're trying to do, which is about bringing economics back to the people.

Dave: Maybe there's our universal basic income when AI takes most of the jobs. All you have to do is follow the good habits, although, man I think I might want to gain that system. A habit is eat six of junk food every day.

Maneesh: Exactly.

Dave: I made that one and smoke two packs a day. I got my ... We'll see how that works out, but I admire the futuristic thinking and the core desire and we've hung out enough that I do know you're working to make the world a better place. Sometimes I think you're a pretty odd duck, but that's actually a compliment not an insult in any way.

Maneesh: Exactly.

Dave: You're a nontraditional and sometimes nonlinear thinker, but you're definitely thinking, which is really cool.

Maneesh: Thank you.

Dave: Maneesh, I asked you a few years ago when you were on the show last, the Bulletproof Radio question and I'm going to ask it to you again, 'cause I doubt you remember your answer. If someone came to you tomorrow and they said, "Look, I'm going to perform better at everything I do as a human being, what are your three most important pieces of advice for me?" What would you offer them?

Maneesh: If I want to perform better at everything I do?

Dave: As a human being? In other words, it's not about just at work or whatever else, but just being a better, higher functioning human.

Maneesh: I think that the first thing, and maybe this is all three, but there are six habits that I think if every single person in the world followed through with, and they're fairly simple, it would improve the majority of illnesses, and the majority of mental health issues and the majority of dissatisfaction, unhappiness and so, I would have the people do those six habits and those habits are, sleep between seven and eight hours a night, drink about two liters of water a day, meditate 10 minutes a day, exercise three times a week, eat a

fairly nutritious, not too many calories meal every day, and have social contact with people that you like, daily.

If people were to follow those six things, every part of their life gets better. That would be first of all, the number one thing I would say, which is optimize for six habits, spend time forming those habits.

Is that good for one? Can I give two more?

Dave: That sounded like you just double the three, but give me two more.

Maneesh: Sure. The first one is optimize for those habits. The second is, to create those habits. Start off by following a disincentives system. Set a bet to do that and watch what happens. I wrote a great article on your site about how to form habits, and I talked about setting bets and then using that to create long lasting habits, so that's goal two. Goal three would be to, obviously, check out Pavlok.

Dave: Nice. Subtle plug there, Maneesh.

Maneesh: Learning from the best, Dave.

Dave: I love it and your URL is pavlock.com?

Maneesh: No. Pavlok.com

Dave: There you go. I spelled it wrong. I'm great lowly investor. Pavlok. I always ... I know it's one of the two, but I always just ... I'm a 50/50 chance. I guess I should get shocked with I spell it wrong.

Maneesh: Yeah, you'd quickly learn, sir. It's like Pavlov, but with a K.

Dave: Alright, got it.

Maneesh, thanks for sharing your vision of the future and your new tech and I know that you've got ... the version two came out with a lot more of the tracking stuff in it, which I'm really intrigued by.

Maneesh: Definitely.

Dave: If you're listening to this, you're a bio hacker, you're looking for some new technology to help you with habit formation, habit change and just know what's going on in there, Maneesh has put a lot of stuff together and you can look at all the code if you want to, which is kind of cool.

Alright, Maneesh, thanks man.

Maneesh: Thank you so much.

Dave:

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