

Dave Asprey:

You're listening to The Human Upgrade with Dave Asprey. Today's show is all about... Oh, it's all about Steven Kotler. He's a friend and a fellow author, and actually a chihuahua rancher in one of his lives. But he's well known for writing about flow states, brain states, extreme athletics, and all sorts of other just really interesting, well-crafted stories. And his new book is called Gnar: Growing Old, Staying Rad. And Steven and I have been friends for what? 10 years now?

Steven Kotler:

Yeah, I think that's about right.

Dave:

Yep. And actually at the second biohacking conference when I was starting this movement, they brought some giant toys including a upside down swing that catapulted someone through the air onto a vendor's table. True story.

Steven:

Not before hitting a woman in the head, then onto the vendor's table.

Dave:

Okay, that's a fair point. It was one of those things like a strike in bowling where you get all of the pins at the same time.

Steven:

It's true.

Dave:

And the good news is that no one was injured, which is why we can joke about it. Everyone was okay. So anyway, we go way back. I've made him scream at 2:00 in the morning in hotel rooms with the electrical stimulation.

Steven:

True story.

Dave:

And the reason I wanted Steven on here is in addition to just being a interesting, fun human to talk to, is that his new book... And guys, if you haven't read one of Steven's books, he's a great freaking writer. Like the storyline in these, it's... You were even nominated I think for a Pulitzer for one of them, right?

Steven:

Two Pulitzers.

Dave:

Only two? But did you win?

Steven:

No, I haven't won. So yeah, I know.

Dave:

I'm just, you know?

Steven:

Loser.

Dave:

So yeah, these are his works. But this episode is about testing your limits and challenging yourself as you age. And as you guys know, part of biohacking is radical longevity. And part of it is cognitive performance and doing things you're not supposed to be able to do when you're 16 or 25. And it turns out if you do those right, you probably won't age as much anyway.

One of the things that happens as normal humans age is they start putting in all these limitations and challenging beliefs and things like that. And some of that is hardwired. Doesn't mean you can't hack it, but it's hardwired. And some of it's really more software-based. So Steven's book is literally about that. It's what happens in your brain in the second half of your life. And by the way, fuck you. That's the second three quarters of my life because I may have turned 27.7% recently.

Steven:

No. But yeah, my good friend, Peter Diamandis, of course does the exact same thing and feels the exact same way as it was [inaudible 00:03:03].

Dave:

Yeah, there's-

Steven:

And by the way, all I have to say is the only point I make about that side of this equation is most of us are going to be old, whatever the hell that means, for a lot longer than our ancestors and probably a lot longer-

Dave:

Very good.

Steven:

... than we suspect. That we can all agree on.

Dave:

Okay. We totally agree on that. And bottom line is if you want to call a second half, second whatever. Things do change over time, you can control how they change to a way greater extent than most people believe. But we did know things about synaptic pruning and all, and you go through in the book. And you do the things you write about. And you talk in the book and we are going to talk about some outdated beliefs about aging that we kind of got started a long time ago and we just never fixed them.

Steven:

What I called the traditional theory about aging, let's start here, is what I call the long, slow rot theory. It's the idea that our mental and physical skills decline over time, and there's nothing we can do to stop the slide. And it actually starts with Freud. I want to say it's 1903, it could be 1908, Freud is about to be 50 years old. He's terrified of getting older and he writes that, "Don't even try psychotherapy with anybody over the age of 50. They can't learn anything anymore. You're wasting your time." And he's not even 50 yet. And then what's hysterical about it is Freud goes on to write three or four of his most famous works in his 60s.

What's hysterical about it is Freud goes on to write three or four of his most famous works in his 60s. So it's not even true for Freud, but that statement has remained with us. If you want to have the craziest experience you can have, go back to Harry Truman's founding statement in 1950 for the Social Security Administration. They had to send out a document basically to everybody invited to the meeting. And the document basically says, "By the way, old people turns out are people too. They have all the same feelings and desires that you do." It's a crazy document.

And this persists into the '90s, which is the 1990s, which is when it starts to wobble. And what we have since learned has replaced it, and this is almost true across the boards. There are obviously things that change as we age, but all this stuff we used to think declined over time. And you alluded to this, we now know it's all use it or lose it skills. And if you never stop training these skills, we can hold onto them and even actually expand them much later in life than maybe you thought possible.

Dave:

Okay. I think I just heard you say old people are lazy. Is that what you just said, Steven? Shame on you.

Steven:

I want to say that I think most people are dead before they're dead.

Dave:

There you go.

Steven:

That's how I think.

Dave:

It's not laziness it. Like you said, you stopped using it. And why you did that? Well hey, that's my next book topic. Said, mother nature's wired you to do that doesn't mean you can't change it. But the idea of not doing things you don't have to do, that's kind of built-in as conservation of energy. And so there's no moral problem with that. And if you allow that to run things just like you allow your hunger to make you eat cheeseburgers all the time. And although actually cheeseburgers are probably better than Pop-Tarts, come to think of it.

So if you allow your hunger to make you eat vegan burgers all the time, that's just true junk food. And if you stay up all night, you never sleep, and you just don't take care of yourself because you're just being lazy about self-care, then you probably are going to be lazy when you're older. But if you do a little bit of self-care ahead of time and you keep pushing yourself and build those habits that you talk about, it might be dangerous.

And the way you open up the book is awesome. It's, "To do a dangerous thing with style is what I call art." I make danger coffee, okay? I'm all about being dangerous. I mean, who knows what I might do? I can do whatever I want and you might not like it, but I have the power. And I love that quote. Why did you pick that quote by Charles Bukowski?

Steven:

Well, the book is a experiment in peak performance aging. The idea underneath the book is as you sort of pointed at, the old idea, right? Long, slow rot theory is can't teach an old dog new tricks. And I was doing a ton of work in flow science at my core field in network neuroscience, which neurodynamics directly, that's how we approach flow anyways, and embodied cognition. And I'm learning and learning, and this is 20 years work.

And all of it says, hey, wait a minute. If you apply these ideas, you should be able to really learn difficult, physical, challenging activities very late in life. And so I decided to try to teach myself how to park ski. Park skiing is the discipline in skiing that involves jumps, doing tricks off jumps and on rails and boxes and wall rides. It's very acrobatic. It's very dangerous. And the general thinking is, you haven't learned it by 35, don't bother. It's very, very difficult. Over 40 or 50, it becomes downright impossible. And so of course I tried to get good in my 50s.

But action sports are about creative self-expression on the mountain. Most action sport athletes, especially in the generation that I came up with, thought of themselves as artists as much as they thought of themselves as athletes. And for sure, my approach to skiing has always been... And skiers use the word steady. It's a blend of stylish and easy. It's the ultimate, right? In action sports, you want to be steady. You want to be really, really stylish, but don't look like you're expending a whole lot of effort doing it. And to do a dangerous thing with style is what I call art, as Bukowski said it. I think in his case he was talking about drinking bourbon, but he did it with a lot of style.

Dave:

There's a corollary to the early days of computer hacking. So back in the '90s when you were figuring all this stuff out, I was a cyber punk. Mirrored shades, leather jacket, and breaking into systems that you're not supposed to break into. But the idea of making it look easy and taking over someone else's system in a way that's creative, and I'm just going to say stylish according to hacker ethos, it's the same thing. It's this idea that you did it with beauty. Like an Olympic diver going into the water with no splash. How did that happen? It's that effortlessness.

I want aging to look like that for me and for everyone, to be perfectly honest. And you're working on that too. I have to ask you this. I wasn't planning on doing it here in the interview, but we're friends. Okay. I talked about you screaming at 2:00 AM in a hotel room. Remember that?

Steven:

Yeah.

Dave:

Okay. So what happened is you screwed up your shoulder doing some sort of ridiculous skiing into a tree or something. I don't remember what caused the injury. But it was hurting for nine months, right?

Steven:

I think it was a rotator cuff.

Dave:

It was. So I took my crazy Russian prototype electrical stimulation device and I slapped it on there. And I had you do the motion while I was putting you under an insane load, way more than your body would ever think was rational, and showed your body it could do the movement. And magically, it stopped hurting. And the next morning you're like, "Oh my God, I have full range of motion. What happened?" But you did scream because that was the body going, "I'm not going to do it." And you saying actually you are going to do it. And it was fixed. But you had pain for nine months because you do crazy stuff, Steven. I mean I don't care if you're 20 or if you're 50 doing your triple flips on skis, getting traumatic brain injuries.

Steven:

It's a fair point. Yes, so-

Dave:

Are you getting that sometime?

Steven:

Let me back up and talk about one thing, and then I'm going to answer that question. We took this idea and I used this sort of methodology to try to teach myself how to park ski. I literally said if it takes five years, and we could talk about why I was doing that. A lot of that grew out of a conversation I had with Mihaly Csikszentmihalyi. The last conversation I ever had with him before he passed away.

But I was like, I was going to learn. It doesn't care how long it took. And I created a list of 20 tricks. And I figured if it took me five years, whatever. Great, fantastic. I did it in a season, which shocked me. Now my ski partner who is 20 years younger and a former action sponsored athlete who had a terrible injury and came back to the sport at the same time I started to learn it, he was using the same methodology. He got incredibly far.

That was cool. But as you know, that's like the world's smallest pilot study. There's two people. But this past winter, we took the same methodology. We took 17 older adults ages 30 to 68 in four sessions on the mountain. Again, taught them how to park ski. The goal wasn't actually to teach them how to do tricks. We break park skiing into the eight foundational motions, and the goal was to get them to be able to creatively interpret terrain features as a faster pass into flow. The flow takes care of the progression and the trick and all that, right?

And so it's like a one inch at a time, goes slow to go fast. Just teaching people how to creatively interpret the mountain, because creativity, that pattern recognition is a flow trigger. And that's what I did, that was the goal. And if you actually go to the webpage for the book, which is [www.gnarcountry.com](http://www.gnarcountry.com), you'll see there's a tab that says, "Peak Performance Aging Experiment." You can click it and watch the video. We made a huge video about the experiment. You can read the white paper. You are right and I am crazy, and I do am more than willing to hurt myself in the name of research. Like, you're totally right.

Dave:

You and me both that way.

Steven:

Yeah, that's what going to say is that is both of us. But I always say, "Well, first rule for Steven is if it works for me, it's probably not going to work for you." The reason I'm uninterested in psychology has always been, it's squishy, it's subjective and what works for you is not going to work for me because of a lot of reasons how personality gets set up, connections to genetics and early childhood experience.

But if you can get to the level of neurobiology, evolution shapes that is shared by all humans and that will work for everybody. So that was the approach we took here. And we then took it out of action sports and ran like 500 subjects through the protocol and got really big performance improvements in their lives as well in the latter half of their lives. So we've got a lot of confidence that it works outside of me. But yeah, I am willing to do. I am willing to dang myself up a little bit in the name of research.

Dave:

Got it. And I don't know that's the best anti-aging path. Because what often happens with just normal humans who aren't wired the way you and me are is that you do something, you get an injury, and it stops you from exercising. And then you get frail hips and you get sarcopenia because it's hard to heal them. And there's times you can push through it and there's times when it's actually just an injury. And I kind of wish when I was younger and going really hard on stuff, even though I was obese, unhealthy. I don't think the three knee surgeries I had before I was 23 have served me well as I aged.

Steven:

Okay. But you know a couple of things. One, of course they have not served you well, right? I've broken 87 bones. I can tell you what the weather's going to be three days out. You know what I mean? For sure.

Dave:

Exactly.

Steven:

That said, and you know this too. And at the end of the book, I start experimenting with third generation regenerative medicine, what we have around a today. And while I think there are ridiculously silly claims being made around stem cells and things like that. If you're dealing with tissue injuries, soft tissue, if you're dealing with muscles, tendons, and even some bone stuff, no regenerative medicine is actually finally grown up. It works. Finally, I've been working with it and playing with it and researching it and studying and writing about it since really the late '90s. And it was, it was a joke then. And it was a joke even into like... Around 2015, it started to get a little bit better.

And in the past decade you're looking at real actual legitimate advancements. And the stuff I play with in the book isn't even, and you know this too, it's not even the cutting edge. As I was writing about the stuff in the book, a friend of mine blows out her ACL. They take stem cells out of her hip, spin them like they're going to PRP the stem cells, and shoot it back and regrow her ACL in five months. And she's speaking again. And this is a top level skier.

So top athletes used to be, two years ago, three years ago, you're OBJ playing football, it's a year and a half recovery from that same problem. And now she's back skiing at a top level after five months. That's crazy, crazy progress. And as you know, this stuff is starting to get democratized. So cost is coming down in America. My mom just had PRP and her insurance covered it. Now PRP is not cutting edge. It's like where the field was five, six years ago, or eight years ago.

Dave:

But it works.

Steven:

But it works, and her insurance is now covering it, right? So that's getting interesting on that front. But the point I want to make on all this, because you've touched on it a couple times and I want to just go back and hit it because I've certainly stumbled or I commented on it. You can rock till you drop pretty much. But one of the clearest things that we see is peak performance aging starts young.

You can rock till you drop pretty much. But one of the clearest things that we see is peak performance aging starts young. I mean if you can make interventions in your 60s and 70s and 80s, and they're going to work and you're going to get results. In our research, there's dietary stuff that they think starts to matter in your 20s and certainly from an adult development. So one of the things... This is covered in the book and I'm just going to say it now because I know you were going to go there but I'm going to spare you the pain.

Dave:

Do it.

Steven:

So Gene Cohen, who is one of the pioneers of peak performance aging, has sort of invented the field of geriatric psychiatry, which wasn't a field until he came along. Literally because we didn't think old people were psychologically treatable. Like Freud said no. And it took till 1973 when Gene Cohen comes along. He's the first guy to say, "Hey, wait a minute. Maybe this isn't true. Let's run some experiments and see."

Anyways, he discovers that rather than an inevitable cognitive decline, because of a bunch of different neurobiological changes, if we get it right and we're going to come back to what it is because that was the point I was going to make. In our 50s, we gain access to whole new thinking styles, right? Really radical new levels of intelligence, new levels of creativity, and really deep divergent thinking. The hardest parts of creativity get massively increased in our 50s. And then you get empathy and wisdom.

And wisdom is the coolest trait in the world because if you want to stave off cognitive decline, fight off Alzheimer's and dementia, you need lifelong expertise and you need lifelong wisdom. Because they're big networks in the brain and they're impervious to cognitive decline. Basically diseases like Alzheimer's, dementia, they tend to target individual areas. And if you've got these very dispersed neural nets holding your information a lot more protected. But what does it mean to get it?

So adult development tells us that if you actually want those superpowers in your 50s, by 30 you have to solve the psychological puzzle of identity. You got to figure out who the hell you are in the world by 30. And by 40 it's match fit. If there's not a match between who you are, your values, your beliefs, and how you make a living or spend the bulk of your time. If you're not living with passion, purpose, and flow, you got massive problems.

And 50s, this is the weird one. This came out of the Harvard Adult Development Study, the hundred years to the adult development. They were the first [inaudible 00:20:24]. In the 50s, you have to forgive those who have done you wrong. Self-forgiveness, you got



to sit down, shame. Because otherwise, the wisdom, the empathy, which is about seeing things from other people's perspectives and all that other stuff. If you can't forgive yourself and forgive other people, that's going to end up blocked. And then in your 50s-

Dave:

The thing is you can do that in your 20s. My whole 40 years of zen thing is about forgiveness, and it's a teachable skill I'm working to get in high school.

Steven:

40 years of zen, you can... I mean, you don't need to go that... Loving-kindness meditation, right? Richie Davidson has been looking at this for 30 years. We have so much data on compassion meditation. And I don't know if you know this, this is really cool. They tested focus meditation against loving-kindness meditation for telomere attrition. And it turns out, focus meditation won't protect your telomeres at all. But loving-kindness meditation actually prevents telomere attrition, telomere decline for some reason that nobody can figure out the neuroimmunology of this quite yet. But it's really interesting.

Dave:

It is really interesting. I see all kinds of markers improve when people learn it. I just found it was a lot easier to go all the way in with loving-kindness when I have a lie detector telling me when I'm not doing it. Now, I agree you can do loving kindness all by yourself. I'm just saying don't wait until you're 50 to master this.

Steven:

No, that's for the amateur.

Dave:

I work with 20-year-olds all the time, or say 20 to 30s, not just in neurofeedback but just in chatting and talking and sharing stuff. When they get it, it's easier because skill acquisition is kind of easy in your 20s. You can still learn languages. And if you teach people a provable skill and it's like a handstand, but you're just doing it with your nervous system, man, the upgrading of the future comes from getting high school students and college students to get that loving-kindness in. Because in all this shit that we go through in our 20s and 30s-

Steven:

If you-

Dave:

... is like a third in like the-

Steven:

Yeah. If you can put down a lot of the... I talk about this a lot in the book. There's a lot of shame along the way that is a tricky one. Really insidious in terms of what it does to human development and growth and emotional regulation and a whole bunch of stuff like that. So it is-

Dave:

And telomeres, and dendrites, and cortisol, and all the other stuff, right?

Steven:

Yeah. And you can set up patterns of inflammation in your 20s that are really problematic in your 50s and 60s, because most of the aging comes down to inflammation. I lost my ability to speak thing. There's language there for half a second, but you get what I was trying to say.

Dave:

It was the pot. So speaking of that, you're still as big a fan of cannabis as you were last time we're hanging out?

Steven:

Clearly, I talk about cannabis in the book. It's a very potent pain reliever and good for inflammation. Recently I published a paper in neuroscience and biobehavior reviews with three other neuroscientists on the flow state onset, what happens in the brain as we move into flow. And it's the first paper that has a full detailed look at the endocannabinoid system and the role it plays in flow. So we are getting closer and closer and closer to sort of nudging of the relationship between flow and marijuana. Though there's still a ton of work left to get actual real answers.

Dave:

There is. And also Daniel Amen's got some pretty interesting looks at blood flow in the brain on cannabis that are pretty disturbing. So I think it's the right strain and the right delivery mechanism for the right biology at the right time to create the right state. It's a precise targeting thing. And like you said, we don't have all the science, but it certainly does some good stuff.

Steven:

I want to jump back to something you said earlier because you were right on on something and I wanted to layer into detail. So one, you started talking about mindset and aging, which is one of the topics that's in the book. The work on mindset and aging is stunning, right? Ellen Langer at Harvard, was the first person through that door, but now there's so many studies that show this. But for example, the correlation between longevity and mindset is wild.

The Ohio Longitudinal Study of Retirement and Aging, which is the most thorough look at mindset is 20 years, couple thousand people, proper mindset towards aging. Which is

literally, I believe the second half of my life is filled with interesting possibilities and I'm excited about it. That's the proper mindset, adds an extra seven and a half years to your life. So that's stunning. The other thing I want to say on this one because it sort of dovetails in with some of the peak performance aging starts young is in this stuff that you were talking about.

When we're younger, we all know that neurochemicals, especially the pleasure chemicals, the reward chemicals, are addictive. Super addictive. And when we're younger, it's predominantly we're run by the seeking system and the play system. Those are the biggest drivers and that's predominantly dopamine and norepinephrine with a little bit of endorphins. And this is where I think the mindset of "old", quote, unquote, actually starts. Once you have the job you want that you go into your 30s or you find the partner you want, or you start to have a family and kids, the neurochemicals you have, we switch our addictions, right?

We go from dopamine and norepinephrine, the seeking system, to serotonin, oxytocin, and really endorphins. These are all safety and security. These are about protecting what you have, not going out, and getting more. Those serotonin is the calming chemical on, happy with what I have. I'm satisfied. And if you want to really thrive in the remainder of your days, however many days there are, and according to Dave there are a lot of days, you have to reboot the seeking system and the play system of-

Dave:

Ooh. How do you do that?

Steven:

I mean curiosity, passion, purpose, all the things that reproduce. I mean, you still want all the other stuff, right? Peak performance aging sort of demands all of your reward neurochemistry sort of working together. You also have to get a grip on the reward neurochemistry. You can't let it be quite as addictive as it was in your youth a little bit. So there's a little more-

Dave:

What does that mean?

Steven:

I think it means more emotional regulation, is what it means. I'll give you a classic example. My own mistake in my Gnar Country adventure, which is I started making so much progress. I came to park ski in my 50s. I thought it was a long shot at best. And the thing that we designed worked so well. The progress itself was really addictive. I rebooted that sort of seeking desire in a difficult physical activity where I had a little bit of a fixed mindset around and then shifted it, some had a growth mindset. The progress is really addictive.

I wasn't mentally prepared for it and the addictive progress kept me. I injured myself a little bit on this adventure, but it was because I wasn't taking enough recovery days. I knew what I should be doing, but I rebooted the seeking system. It was so pleasurable I

wasn't even paying attention. So that's what I mean. There's a little bit of an emotional regulation that matters. Because when you're younger and you skip recovery days, it's one thing. But if you're trying to do this kind of stuff over 50 when it's a little harder to recover, takes a little bit longer, then you have to be cautious around that. That's what I mean.

Dave:

How does one really go about doing that? I don't understand the problem. I've always had, I don't know, fifth grade curiosity about everything, which gets me into all sorts of trouble but also makes me creative. It's a personality attribute or something. But clearly, based on your research and based on what I see, people do lose their curiosity and they lose their zest for life. And I feel like a lot of times we'll just give them some thyroid and some testosterone, and magically it comes back. Or address dopamine with L-deprenyl and it comes back. But is there something else going on in there?

Steven:

Right. You are not wrong. There is neurochemical decline over time and it turns out there's actually a good use for SSRIs. They're terrible for depression, right? Because they're blunt instruments and they globally raise serotonin levels. And that's not how depression really works in the brain. But serotonin levels do drop over overtime. So it turns out that low dose SSRIs in people over 75 actually has a huge impact for exactly the same reasons. You're talking about Daniel Levitin. Daniel Levitin writes a lot about this, the neuroscientist. It's in his book, Successful Aging. He talks a lot about that.

Dave:

Yep. In fact, my favorite one, L-deprenyl. It's not even an SSRI, it's an MAO inhibitor. But it increases dopamine sensitivity and you use low doses of that. It's a classical anti-aging hack.

Steven:

What? L-deprenyl? I've never even heard of it.

Dave:

L-deprenyl, or selegiline is another name for it. But even when you're younger, you can use one or two drops of it and your dopamine systems just wake up. And as you age, you add one more drop for every 10 years that you take every day. And as long as you're not doing DMT or something because it'll inhibit that. It is a massively potent brain anti-aging and performance-enhancing substance that just gets forgotten about because things get trendy. So we're all about the NAD right now, but honestly, L-deprenyl is cheaper. It works on an entirely different system. But for the kind of stuff we're talking about, it's an antidepressant that you take more of as you age that keeps dopamine sparking.

Steven:

Sparkly.

Dave:

Right. And that alone would address what you're talking about.

Steven:

I mean by the way, you don't even have... So Gene Cohen is the one who started figuring this out. He figured out that in our 50s there's another gateway to adult development, which is creativity. So while we get creativity and intelligence and all these things over 50 because of neurobiological changes to really gain all the access to it, that's the hack in your 50s. And the point, I'm wired like you. You know that. I'm insanely curious, it doesn't go away.

Dave:

Childish, immature sense of humor. I mean we're soul brothers.

Steven:

All those things. Very true, Dave. Very, very true. And you want creativity. I mean that's what you said, like how do you reboot it? Really start training up creativity in your 50s. I always tell people the easiest way to train creativity is to stop buying your culture. You can't buy culture anyways. You go to a restaurant. I love this with foodies. They go to a restaurant, they think they're having a cultural experience. And I'm like, the only person who's having a cultural experience are the people in the kitchen who are cooking the food. They're having a cultural experience. You on the other hand, on the outside, are buying your culture. Stop buying your culture, start creating your own culture. That's what nurtures this in a really deep way.

Dave:

This is from the Upgrade collective. Debra, thank you. But I'm just going to read it directly because it's that good. What else can we do to age well besides smoke weed, jump off mountains, and forgive people? She summed up your life's work in that question.

Steven:

Reliable access to flow certainly matters over time. So let's just go back to the use it or lose it skills. So one, on the physical side, you have to train. You can preserve significance amounts of strength, stamina, flexibility, agility, and balance long into life. But those are five different categories and they all need to be trained simultaneously. You can put them together into certain activities, but you can't skimp on any of those. And with things like balance and agility, you have to be smart about it because as we age... We have prime mover muscles, our big, big thick muscles, and we have stabilizer muscles. And what happens is the prime movers, whenever we have bodily injuries or whatever, when we're healing around that stuff. You break your left ankle. And as you're

healing, your right leg gets a little stronger, your left leg learns to compensate for the injury. That doesn't tend to get fixed over time and tends to magnify. And as a result, a lot of our prime movers take over and our stabilizers stop doing work.

This is one of the reasons that falls increase 40, 50, 60% correct over 50. It's this issue. And it's just about knowing how to train and being able to train all of those things at once. So that's what has to happen on the physical side. Cognitive performance, as we said at the beginning, lifelong learning is foundational to stave off cognitive decline. If, for no other reason, then expertise and wisdom are both the two things that are actually neuroprotective against cognitive decline. And those are the skill sets you're aiming for. Then we talked about all the gateways of adult development that you sort of need to path through.

And then we know this, right? And they are really basic lifestyle factors. Older adults who engage in challenging social and creative activities that produce feelings of mastering control are the ones who thrive the most. And mastering control are really actually key. Both of those feelings, those emotions, there's a lot of neuroimmunology work that show they both increase T-cells or natural killer cells. And this is one of the reasons flow matters over time.

Flow is, from a scientific perspective... One of the things that flow does, we now believe it's the evolutionary signal mastery. It's the brain's way of saying, "Hey, you've mastered this thing, you've learned it." Because knowing when you're good at skills is important from an evolutionary perspective. So one, you get that feeling of mastery directly from flow. And one of the core characteristics of flow is it produces a sense of control. And these are usually important. I mean even Ellen Langer, who I mentioned earlier, the queen of mindset. Her famous study on perceived control back in the '70s. This is the study that changed everything we thought about aging.

She was hired to make life better for people in a retirement home. She took a group of 16 folks, divided them into two groups that both got the same interventions. They both got plants in their room, more movie time, and more social time. And the difference was one group, they had to take care of their plants, they got to choose what movies they were going to watch, and they got to choose when they were going to have more social time. The other group, the nurses took care of their plants, and they got more movies but they picked the group movie, and they got more social time but everybody it was a Tuesday at 4:00.

And a year and a half later, the group that had perceived control, because they didn't have a whole lot more control over their life, they just had this increase in perceived control. Every single health metric you could possibly imagine was through the roof. But the craziest one was they were twice as likely to be alive. That was the biggest difference.

Dave:

I truly think that's why we still have voting.

Steven:

Perceived control.

Dave:

Because it gives people the perception of having control, which makes them happier and longer lived. Even though, let's face it, you have absolutely no control over whatever crackhead is running the White House right now. Or at any time in the past or the history, you actually have no control. But the perception that you have control probably does something neurobiologically that's valuable for humans. This is why we keep-

Steven:

This is very Brave New World. This is very Brave New World. We're going to give them soma. But you're not wrong. You were certainly not wrong about that. And certainly for health and longevity, perceived control really, really, really matters. And control really matters. And flow because the feeling control is built into it. This is one of the reasons flow matters so much as we age.

Mihaly Csikszentmihalyi, the godfather of flow psychology, he really spent the bulk of his career focusing on questions of adult development and flow. In fact, the last paper he published before he died was on, did flow proneness change over time? What changes? And you know this is a moving target variable if you look at the data. It's only when bodies really start to break down and you can no longer do the same thing to get into flow that it starts to taper off a little bit.

So that changes, obviously. You go back 20 years ago, that was in people's '70s because that was when we tailed off. And now, if you look at it, it's late '80s. So it keeps getting pushed out as we live longer and as we maintain health and vitality longer. So it doesn't seem to drop off at all. And Csikszentmihalyi argued in two or three of his books that flow is the actual engine of adult development, which I tend to agree with.

Dave:

Wow, that's a big statement.

Steven:

Well, this is how you need to think about it. So flow states have triggers, the most famous to challenge skill is balance. We get into the flow through focus and we pay the most attention to the task at hand when the challenge slightly exceeds our skillset. So you want to stretch but not snap. When you're doing that, you're using your skills to be utmost. So when you get into flow, this is why flow amplifies. You're getting learning, you're getting growth, you're coming out the other end. You're a more complex and adaptable person.

And, flow also automatically expands perspective and empathy. So wisdom. And so a lot of the traits we associate with adult development are automatically expanded. I mean it happens because of how empathy and wisdom, a lot of that is in the temporoparietal junction, which is really active in flow. And this is why we see things from other people's perspectives and why we become one with everything in extreme macro flow states. It's the same mechanism.

But all that happens in flow. With Csikszentmihalyi statement, I tend to agree with them. I want to study it. We've been trying to figure out, can we run better experiments and things like that. He came at it from a psychological standpoint, and the psychology definitely holds up. Does it hold up neurobiologically? Is an open question and I'd like to do more work on that. And we're thinking about the collective right now.

Dave:

I'd like to see the results of that as well. All right, let's say that you're 90, smoke weed, jump off mountains. What does a 90-year-old do for a flow? There are slowing of brain cells in most people. What's the safe way to do this?

Steven:

Yeah. No, so let me tell you where this all started. I've been studying this stuff. As you know I do my work with chihuahuas. We do a hospice care dog sanctuary and we've been massively successful at extending the lives of dogs. So one of the first things I started to realize when the quote, unquote, "lifestyle" factors caught my attention, it wasn't like I thought the Blue Zone research was particularly spectacular.

It was that when I looked at the Blue Zone research and I looked at all the other lifestyle stuff, I realized we had done very similar things for the dogs. And we were taking dogs with late stage heart disease and cancer, and getting three to five more healthy active years based on lifestyle interventions and no real extreme medical interventions. Because when you have the volume of animals that we work with, you can't. There was no way to afford those kinds of medical interventions. Especially when we were starting up, we were getting crazy results.

But it started with, "Holy shit. What's going on with our dogs and is this even possible in humans?" And I started looking in humans and I went, "Oh wow." They've discovered very, very similar things. That said, right before COVID, it was the last com... So Mihaly Csikszentmihalyi passed away in October of 2021. But I talked to him in, I want to say July of 2020. And I called him up to ask him a funny question. I called him up because one, he had had a stroke and I wanted to make sure he was okay. And two, they had translated a bunch of his work, early interviews out of Italian and into English.

And I was reading them and there was all this stuff about early Yosemite. I knew he was a rock climber and a mountaineer and former outdoor athlete. But he was quoting, naming hardcore Yosemite Valley rock climber names that I was like, "Oh." He would've only known these people. He was really, really serious. So I called him up and I was sort of kidding him. And I said, "Mike, I know in your TED Talk you talk about stumbling upon flow in a concentration camp during World War II, and then your original work was on artists. But in between, you were a very serious rock climber. And tell me the truth, were you getting into deep flow states out in the mountains and just didn't know how to talk about it with academics so you started writing about it with artists?"

And there's this huge pause, like enormous. Like 30 seconds go by, a minute goes by. And minute and a half and I'm thinking to myself, "Holy shit. I've offended this man who's a legend to me. Holy crap, I've totally offended him. Wow." And suddenly he says, "Steven, you got to be careful." And at this point, I think to myself, "Holy shit. Is he lost



the plot? What's he talking about? I got to be careful? Like, wow." And I'm like, "Well, Mike, what should I be careful about?" He said, "Well, Steven, you do something your entire life for flow. And then you get to be my age and forget about climbing mountains. Some days I can barely get out of bed. You need a backup plan. You got to be careful."

Dave:

There you go.

Steven:

So my primary flow activity is skiing. It's always been my primary flow activity. Before Gnar Country, I was a big mountain skier.

Dave:

Yeah, you're not.

Steven:

Which not the only way I got into flow was charging down really big, gnarly, scary lawns. And I knew, if that was my main source of flow as I aged to something, I was absolutely right, I'm screwed. Why did I start park skiing? That seems totally crazy. But I figured if I could get to intermediate, it was going to be dangerous going zero to intermediate. But at intermediate you can sort of check your progression. There's much less randomness and I would have all these millions of ways to creatively interpret the mountain. I wouldn't have to use risk as a flow trigger. I could use creativity, and creative and embodied movements and all these other things so I would have a million more entrances into flow over time. That was the entire Gnar Country adventure. That was exactly where it came.

Dave:

You're the only human being is like, "You know, these bombing down, these dangerous runs, it might be a problem. I'll just learn park skiing to be less risky." But that that's a uniquely Steven Kotler thing to do. For the rest of us-

Steven:

But you see the logic.

Dave:

I do see your logic. But for the rest of us mere mortals, might I suggest sex as a way to get into flow that you can do as you age? You're less likely to be injured even if you're very... Like park sex, maybe. I don't know what you're into, but.

Steven:

By the way, I'm going to also teaching myself how to play piano.

Dave:

Okay, that's a good flow. Or chess probably too, right?

Steven:

Park ski. I haven't gone back to chess, but I will tell you what I have been doing. There's gaps in my math. And as you know in neuroscience, you can't really have gaps in your math. I got so frustrated I've gone all the way back. I started with Algebra 1 and I am literally working my way all the way through because I was sick of it. I was like, "You know what? First of all, this is good for my brain as I age. And second of all, I'm annoyed that there's something here I don't understand and I don't know." I was just tired of it. So chess, maybe it'll be the next decade, but these days it's been calculus.

Dave:

So you're doing calculus for a flow. You're like the weirdest jock nerd combination that's ever been made. You realize that, right?

Steven:

Well, I'm an artsy jock nerd.

Dave:

Oh, okay. That's a fair point. So jock nerd with a ponytail, I take it back. All right.

Steven:

You're the one with the ponytail, jock nerd.

Dave:

I own it, although I'm probably not a jock. I like to do the minimum necessary to look and feel like a jock without having to have the big ego. No, I'll be straightforward. I like going for hikes and mountains. I like beauty. I like certain physical activities, but I don't want to go to the gym and practice dribbling soccer right now. It's just not very high on my list of how I could spend my time. So if I can acquire those skills or the physical results of those skills in 1% of the time, I'm going to do that and I'll spend the rest of time going into flow state in other ways that serve me and the world around me better.

Steven:

Here's the thing I want to... All that is true. All of that is right. Here's the point I make at the very end of the book, which is that action sports are actually anti-aging medicines in very specific ways. One is action sports... And I'm not telling people to learn to park ski, there's a billion action sports to choose from. But they all demand strength, stamina, flexibility, agility, and balance. You get all the use it or lose it skills in one activity.

Also, if you want to protect cognitive function, what do you want? You want neurogenesis. You want to birth new neurons and create new neural networks. That's how you're going to protect against cognitive decline. Most of the neurons in the adult

brain that are born go up in the hippocampus. Even the very latent life, you're birthing 700 new neurons in the hippocampus a day basically up to the point we die. But what are those neurons? What does the hippocampus do? It does predominantly map making, that's grid cells and place cells.

So if you really want to preserve cognitive function, you want to basically use the hippocampus in the way that evolution designed it. You want novel, challenging experiences in outdoor environments. Because the brain was designed in an evolutionary sense for hunter-gatherers for a very long time. Remember where you are when important shit happened. That's what our brain is designed to do very much. So action sports. I'm not saying you have to go out and learn how to park ski, but you want to go do your hikes outside in novel outdoor environment.

I don't know if you've seen this. They did a study. They didn't include action sports, which bummed me out. But they did a study, I want to say 10 years ago, about which sports have the best impact on longevity. Number one, tennis. Number two, badminton. Number three, soccer. Now one thing that's worth pointing out, all of those are social activities. Because when they get to number four, it was I cross-country skiing and then running. And so there's a list. But once you get to four, they're all solo activities and we know that it's really important to have social connection later in life.

And they didn't test action sports, but I think you're definitely right about hand-eye coordination. I tell the story in the beginning of the book or the end of the book of the Mystery of Stradivarius, which is another one of those mysteries that I'd stumbled upon. Stradivarius made 50% of the rarest musical instruments in history to the fact that I stumbled upon, which I was like, "Oh my god, that's bizarre." One dude built half of the most valuable instruments in history. That's crazy. What other field has that ever happened in? And as I'm sort of researching that and sort of geeking out because I'm curious, I discovered that two of his most famous instruments were made when he was 92 years old.

At that point, when I stumbled on that fact, I was still under the influence of the long, slow rot theory. This was the point I was like, "Well, wait a minute. There is no possible way..." If fine motor coordination declines over time, if dexterity declines over time, manual dexterity declines over time. "There's no way a 92-year-old dude makes a priceless viola." But that was when I started saying, "Hey, wait a minute. There's something really rotten with this information." Of course, Stradivarius made a thousand musical instruments over the course of his lifetime. He never stopped making them. So use it or lose it skills. Perfect example.

Dave:

There's a little more wisdom in Stradivarius as well because he told everyone how he soaked his wood and did all this stuff. It was all bullshit that he was telling his competitors to throw them off how he did it or that he didn't soak it dry the wood some sort of a thing. I don't remember the exact-

Steven:

I didn't know that. That's brilliant. That's brilliant.

Dave:

And then they found out by looking at a shaving of one with an electron microscope like, "Wait a minute. This thing's been soaked forever." I think he told him it was dry. So he basically misdirected everyone, which is part of wisdom. And then his mastery that happens from doing it over and over, those fine motor skills, it's like a surgeon who's done it for 20 years can do things that a new surgeon just can't do until they get that layering.

And the overall reason I like your book, I like your approach on this, is that I wouldn't be here with the brain and the biology I have now if I didn't, out of desperation when I was about 25, 26, start hanging out with people three times my age who were working on the anti-aging problem before it was cool to do that. Because I was so profoundly sick and just fat and my brain wasn't working. But I realized I'm downloading all this information from the masters.

And even now, a lot of my guests on the show are 60s, 70s, 80s, because I want their 40 or 50 years of work and I want to be able to ask them any question and download it into my audience's brains and minds so we can maybe get the wisdom faster. And if we can make these people healthier with better working brains and maybe give another 20 years, the wisdom is going to compound and compound and compound. And it does share down through the generations.

And the people in their 20s, which is by the way, the second largest cohort of people listening to the show. They're like, "Oh my God, I'm getting such an unfair advantage because I just got all this stuff. I didn't have to go do it all." Just what you shared about the stages of development right there. If someone just picks that one nugget of wisdom from you and says, "I'm just going to work on that for a year." You just saved them like 10 years of crap in their life. And we just have to get older people who kick ass. And that that's kind of what you could have named your book if you didn't name it Gnar Country, right?

Steven:

Old people kick ass. I mean the other thing is this. We do tons of work with CEOs. I've had hundreds of conversations with thousands of CEOs at this point, everybody says the same thing. The two skill sets that I need the most in the 21st century, they're the hardest to train for or hire for, are creativity and empathy. And creativity matters because the rate of change in the world is ridiculous. And if you're going to innovate and keep pace, you need it in your employees.

And empathy, one, teamwork is at the heart of any good company. And without empathetic team members, you've got no collaboration, got no cooperation. But also if Bezos is right, and even you're right from back in the day, customer-centric thinking is the mantra of 21st century business. Without empathetic employees, nobody's thinking like your customers. And a well-trained over 50-year-old is the ideal worker for the 21st century. You're talking about the dream workforce. So it's really interesting because there's a business revolution sort of tucked inside all of this waiting to happen that's really exciting as well.

Dave:

Okay. I'm a hundred percent with you there. And so much can happen if we just get that dialed in for CEOs. It's a big part of my mission when I work with them as well is let's just get those tuned in. But I'd also add working memory. There's a really high correlation between working memory, size, and ability to run larger companies. And as you climb up through the executive ranks, quite often the CEO and senior operating people in the company have a working memory that can store about 10 digits. And if you go down to the average of seven, that's your management level. And then people who can only remember six, it goes down. So that ability to rapidly swap things in and out of your bio.

Steven:

I'm fascinated by this. I want to see the research on this. That's crazy. I didn't know. That makes a lot of sense to me. One of the things I've always thought about working memory is if you write books, for one example. If you do anything that requires you to hold tremendous amounts of information in your head all at once, and books or long form articles, research, any of those kinds of projects tend to require that, right? You can't write a book. You can't write 250 pages if you can't hold 258. There's going to come a point when you have to start moving shit around and it's in nobody's head but yours, right?

So those kind of skills. I think working memory in that way, exactly what you're talking about, it's trainable. But most people don't challenge themselves. Most people never even tried to write a 10,000-word article, like a long form New Yorker style article. But even that, holding all that information and being able to move it around. And I do remember one of the reasons I know it's a trainable skill is because I remember the first handful of times I wrote a 5,000-word article. My editor got in my face, he was like-

Dave:

It's very different.

Steven:

... "Move it around to ask me for changes." And I was like, I couldn't even see the whole article that I had written.

Dave:

Yeah. You have to draw a picture, at least that's what I do, of the entire book to be able to see what the book looks like. And then that means you can change how the image looks in your head. Otherwise, it's impossible. For the first book, it took me five years to write it in part because of that problem. And then I got the skill. But I want to ask you this. The articles, 3,000 plus words, in several pages, no one reads them anymore online. I write them and it's so down in social media with your five bullet points, while someone's dancing. Is that making people older faster?

Steven:

That's an interesting question. Sure there's all kinds of advantages in newer media corollary that I'm not looking at here. But yeah, David, I think I agree with that statement. Certainly what I've noticed over time is what has certainly been lost is now language has to be unbelievably boring and communicative. There was a level of... You said you were a cyberpunk. Go back to William Gibson's stuff from the '80s or the '90s, people can't read it today. It's too confusing. They can't follow that plot literally today. So there's like a richness in the storytelling that has gone away. And our ability to understand complicated metaphors and similes has gone away.

I was rereading a lot of Annie Dillard's work recently, especially her book *For the Time Being*, which is absolutely beautiful. And I was thinking to myself how most of the book is a metaphor, right? I mean, it's an argument with God. The entire book is a lengthy argument that she's having with God from a scientific perspective. And if you were to write it today, I don't think... I mean people consider it one of the great books of the 20th century. I don't know if you could write it today.

Oh, there's a lot of stuff like that where I'm not... There's cool stuff that has emerged out of some of the social... You can do stuff with language and technology that's interesting, but I think there's some levels of cognition that have been lost. I think they'll come back with new things. But yeah, I think for now, I think you're probably right.

Dave:

But here's a question for you, Steven.

Steven:

Yes, sir.

Dave:

Flow state and reading. Do you get into a flow state when you read?

Steven:

It's interesting. I always say one of the marks of knowing a subject actually is when you can get into flow state while reading the textbooks, right? When I started to get into flow while reading neuroscience textbooks, that was when I was like, "Oh wow, this is a really interesting marker for expertise."

Dave:

Wow.

Steven:

But yeah, I always say that you know you're an expert when you're reading the textbooks and they read like adventure stories. By the way, first actual adult development researcher in the world was Bernice Neugarten, right? She, in 50 something, the University of Chicago gives her the first PhD in Human Development.

Her argument, she's exploded the idea of the empty nest syndrome and menopause as trauma. And all these old ideas, she exploded a bunch of them.

But my favorite thing was she proposed the first theory of adult development based on the social clock. So what she basically said is society says this is the time to get a job, this is the time to get serious, this is the time to get married, this is the time to have kids, and you're either on schedule or off schedule. And either way, there's a whole bunch of societal pressure that comes with being on schedule or being off schedule. And that's the actual engine of development. So I was listening to you talk about social pressure, and I was thinking that Bernice made the argument that this is actually one of the things that drives us, that ages us.

Dave:

Interesting. I believe it. If we could boil Gnar Country down into just one thing, it'd be really hard to do. But one of the things that you said first on the interview that I think comes through well in your book is just the idea of keeping your curiosity. That anytime someone says it's impossible, anytime someone says to me like why? Is that real? Is it true? What if? And just always having that going. I've seen your work with the Flow Genome over the years, and remember I was the very first investor in it? Like in what? 2013 or something?

Steven:

Way back.

Dave:

And I just see good stuff happening, but it requires continuous curiosity sometimes for 10 years or 20 years. And if we can help our current eight-second attention span, TikTok-addicted friends of all ages, turn curiosity back on, I think it's going to make the world a better place. And we'll have less decrepit people [inaudible 01:02:26].

Steven:

Certainly. A, you're going to have less decrepit people. And B, curiosity is a weapon for success. It's a weapon for success. And I will say, I don't know if I can make this as a blanket statement, but I know very, very, very, very, very few super successful people who do not have a burning curiosity still, like endless. And I think it's such an important driver all throughout our lifetime.

Dave:

Well, let me ask you this before we wind up the interview, because we're over time. What's different about you that let you keep it? Was it your parenting? Was it your schools? Are you just stubborn? What let you do it?

Steven:

So everything about me as an adult from age, at least 15 to, say, 35. That 20-year span, a lot of it is spent trying to solve a fundamental puzzle which is, how do you get paid to

write? I knew I wanted to be a writer from the time I was four. And by the time I was 15, 16, I realized that I didn't fit very easily into nice molds for society. I didn't slot well and that this was going to be a challenge. And I didn't want to be poor. And most writers ended up poor. So not only did I want to make a living as a writer, I wanted to make a good living as a writer.

So one of the first things I figured out when I started working as a journalist is journalism is about exploiting your curiosity. Anything that you know sort of a little bit more about than my contemporaries was an advantage. So cultivating curiosity was how I made a living, especially as a journalist, right? By the time I had solved that puzzle, then I was writing books, which obviously you still needed. I'm running a research institute. So all those things still require curiosity, it just continued to feed itself. But in the beginning, it was a solution to...

We didn't have a ton of money when I was born. My parents were young and without a lot of money. My mom knew that books were good. So we would go to the library and she'd get me 50 books and read them to me until I could read them to her. And then even when I was growing up, if I was curious about stuff, she found ways to let me indulge in it one way or another. Even if we couldn't afford it, she would find ways to make it possible for me to indulge those kinds of things. So I was raised a lot. My mom's secret to parenting was cultivate curiosity in the kid, keep them busy kind of thing. So I think it's been with me all along. But it was a weapon in terms of writing success for me.

Dave:

So it was the desire to get paid doing what you love that helped to drive it. I'm always intrigued to get a chance to pick your brain. I love it that we're going to be on the New York Times list together. Assuming listeners, help out, guys. Gnar Country and Smarter Not Harder, buy them together. You're going to read them both. You're not going to read the same thing in either one, but they're both going to help you get there faster, which is cool.

And I got to say, your abilities as a writer stand out. I like to think I'm better than average with four New York Times Bestsellers and whatnot. But your storytelling is fucking legit. Just author to author, every time I'm like, "God, how do I do that?" So I'm helping myself improve when I read your books to figure out how you're getting there. So that's just a genuine compliment. No ass-kissing there. Good skillset.

Steven:

Thank you. I appreciate that. That's very sweet of you to say.