Michael:

Welcome to our exclusive interview and conversation with Cal Newport. Cal and I have been friends since the seventh grade, that's about twenty-five years, and this is the first live thing we've done together.

Right now the Coronavirus is on all of our minds and there's a huge amount of news on the topic. So, on the one hand, this is gonna be a respite from that, and on the other hand, it's also going to be really valuable because the topics we're going to talk about around learning, and coming up with ideas and being able to express them, are really relevant right now.

Cal has written six best-selling books. He went to undergrad to Dartmouth and had a Ph.D. in computer science from MIT and is now a professor at Georgetown.

For everyone who is going to listen to this in the future: the Learning How To Learn members get this for free as part of a live broadcast, but if you like the recording or the notes, you can join the Mental Model Club.

With that, let's jump in.

Cal, the first question for you is **what's your mental model for what it takes to develop a high-quality idea that's valuable?** And not just as a writer. We're in a knowledge economy, we're collecting knowledge and manufacturing knowledge to come up with better decisions. How do you think about that process and what are the steps?

Cal:

First of all, let me say this. Being our first live event, I thought we would be focusing mainly on social issues from the seventh and eighth grade so I'm a little disappointed. Putting that aside, that's actually a good question. I mean, **I'm essentially in the business of idea generation.** I have two jobs — I'm a computer science professor, and I'm a writer. And in both of those jobs, the number one piece of valuable output I produce is ideas. In computer science it would be mathematical theorems that advance the state of the art and are good enough to get accepted into competitive peer-reviewed publications. Typically those have a 1 in 5 acceptance rate, so there I have to do sort of intellectual warfare with other people who are really smart, and try to come up with ideas that are better than 4 out of 5 of them. Same thing in the world of book writing, obviously.

Michael:

What would you say your average acceptance rate is?

Cal:

There's a little bit of randomness in it but I have been successful in the publication. In academia, especially scientific academia, the key metric you want to understand, the productivity of a researcher, is called an h-index, which actually comes out of physics, and it is defined as the largest number X such that you have at least X publications with at least X citations.

Michael:

Can you give an example?

Cal:

My h-index is 29. That means I have 29 publications that have been cited at least 29 times. Total number of publications I've written is something like 70 or 80, but the reason why it's interesting is that if you have a ton of publications that no one cites, your h-index is very small. If you have one publication that gets cited a lot, your h-index is still going to be very small. So if I write 100 papers and no one ever cites them, and I have one paper that is cited 1,000 times, I still have a very small h-index. What it captures is not just how much you publish, but how much it is getting cited. My point being is that 29 is good for my stage of career, so it's a relatively high success rate, but it's very competitive so idea generation is very important. And then the same thing I've seen in the world of book publishing. It's all idea, basically. I mean, there's other factors that help it, but **the idea behind the book is going to be by far the biggest factor determining whether or not the book has a lasting market.**

Michael:

I would also say it's even relevant for decision-making in business.

In my mind I divide the knowledge work into these different categories: routine and non-routine. So if you're part of a system and doing the same thing over and over again, you're not judged by your ideas; but if you're in a non-routine kind of situation where you have to make decisions, it's very much about how you collect the knowledge and use it. And the output is not a paper or an essay, but it's actually a decision.

Cal:

Right. For example, if you're an entrepreneur, your idea generation is crucial, and that already covers a huge swath. As for my mental model, the thing I would emphasize is I'm in these fields where it's more distilled — what you're doing is producing ideas, which is useful because then it allows me to think very deeply about how to do that. And I would say a key component to my model is **the sheer number of cognitive reps required to get to a good idea,** and I think **orders of magnitude are larger than what most people assume.**

Repetition And Iteration In The Ideation Process

Michael:

So how would you think about that? People thinking “OK, to have an idea I just come up with it randomly” versus “OK, I need to think about this for a year, to constantly talk to people and iterate on it before I come up with something.”

Cal:

I would say for me for a book, for example, my average gestation time before I'm even writing a book proposal (which is before you would even write the book) is probably 2 years. Now if I'm doing an article, a long-form article for a good publication, there might be 4-5 months. If I'm doing a peer-reviewed article, like a computer science article, there's usually a 1-year period, sometimes 2 years.

What happens a lot in our field is that we go to these conferences for other people in our field to present papers. When you're in person, you have these conversations that lay seeds for the ideas that'll be your next paper. If you're lucky, you'll be able to reap some of those seeds the next year, but oftentimes it takes about two years. You sort of work on it, it's not quite ready, and by the second year it's fully gestated. Because of the Coronavirus this summer, we will probably see some sort of effect because our conferences are in the summer and it might actually slow down, we might get off cycle by a little bit.

So, there it's about a 1-year period of working on things off and on. My point is, I see it as a ton of thinking and testing, **it could be months or years of thinking and testing that actually goes into getting an idea that's good enough** to support a book, or a high-quality article, or an academic paper.

Michael:

Yeah, I remember actually you had this model for a while, in college, when you were writing the book proposal. I don't know if you had a name for it, but I remember you had the model of how you're gonna keep on iterating on the book proposal until every time you share it with someone they would immediately get it and be like, “Oh my god, this is amazing!” Most people just don't iterate until they reach that point.

Cal:

I think the lack of iteration is a big issue. In writing, for example, I think there are issues with these models that are around: ripping off the Band-Aid, going hermit mode for 3 months, writing the book, that type of model. It’s not really the way that professional writers write the high-end books. It's not a word count game. That's the mechanical piece, but the ideation piece is something that I think really does get short shrift. I'm writing a book now, I just handed in the manuscript a couple of weeks ago, and my original notes on this book are from 2016. I actually stopped and wrote another book in between.

To elaborate the model for writing a little bit, I definitely use my blog for this purpose. One of the things I like to do with my blog is explore ideas. With almost any book I write you're going to see about a 2-year lag behind the book, with more and more blog posts exploring ideas around the book. I do a fair amount of paid speaking. I started to explore the ideas in the paid speeches, especially when I do sort of smaller events with C-suite types, for example, where you go 1-on-1, you have a small group of smart people, and that really starts to ramp up the ideas and polish the ideas.

If you go back and do archeology on my blog, you'll also find a lot of storylines that I never wrote a book about. You'll see that I'm writing about it quite a bit and then it sort of peters off, you don't hear much about it anymore. That's ideation. The feedback I received for those ideas was such that I don't think this is quite coming together. Getting an idea where the pieces all come together, and it snaps, and it seems right and supported, that’s something that you should see as a really interesting but difficult activity. It's really wonderful when all the pieces come together. You could compare it to a statue that takes a long time to be carved and to get it just right, it's going to take a lot of work.

What Makes A Quality Input

Michael:

Have you heard of Howard Gruber, who was a researcher in the field of creativity? He studied Darwin as a model of the "networks of enterprise" that creative people are building. Someone like Darwin or other creative people, they're not just working on one idea. There are multiple ideas that they're testing and exploring simultaneously. Some of those lead to a dead end; for some of those there's a dead end which gets reignited like 2 years later when they get a missing piece from another strand. Thomas Edison had kind of a similar thing.

Cal:

Yeah, that is absolutely right. And the other piece that brings up, which I think is the second piece other than time, is input. At least when it comes to academic work and sort of nonfiction writing like I do, **input into the ideation process is crucial.** Most successful academics read papers all the time. They don't just read them, they try to dissect them, they try to understand them. When you really push down to it, almost all breakthroughs come about by you taking components of other things, reconfiguring them, and building on them a little bit. So the very top researchers in my field are the very top paper reviewers. There's just no distinction between it.

In writing, I tell people the non-glamorous part of being a professional nonfiction writer is that you read all the time. Reading sounds great, people like reading, but you have to read a ton. It's the grist on which everything else is built. An average book will have 200 citations, 200 footnotes, and you have to have these raw components from which you can actually start to piece together and build out what you're going to do. It's just constant reading of books and articles, collecting notes on it, thinking, reconfiguring, approaching reading with the mindset of "OK, how do I break this down and understand it and explain it to someone else?" It's **consciously trying to take information and then put it into a coherent model in your own cognitive schema.** So there's a ton of intake of information and processing. And then, a ton of ideation among this. You are reconfiguring this information, you have to try to get it together into an idea that is just right — which itself, of course, is a hard process.

How To Have Rare And Valuable Ideas

Michael:

Yeah, I think about it as an evolution model. Say, you want to create a better toaster and you

are starting from scratch. It's kind of silly to not take the best of what people have already spent their lives researching, understanding. It took them many months to come up with an idea and you can get that very rapidly.

OK. So when you think about the input model, there's a quantity part of it and there's a quality part of it. Part of the goal is to have **high-quality ideas that are rare, that other people don't have,** because if everyone else has the idea, then it's not valuable. What do you think about how to have these rare and valuable ideas? Is it about just reading more than everyone else? Is it going cross disciplines for you? Is it having a unique thinking process?

Cal:

It's a good question. I think there's a couple of pieces to it.

- Certainly, having the **information base** is important, what information you put into the base affects what the possible outcomes are. If you mix some disciplines, for example, you have a different collection of ingredients to build from, which is useful.

- I've also found that it's really useful to have **a point of view**. It helps you organize the information and look for specific type of ideas. In my writing, I have a point of view: this is the type of things I write about, here's my perspective on this topic, and I can see the world through that perspective. To some extent, I do so in my academic research. There's certain types of topics that I'm interested in, so I collect information with that perspective in mind, and then that perspective also informs the type of ideas that you actually attempt.

I think both of those are important. But honestly, **with the sub-par ideas,** let's say like a book that just doesn't do much, or paper that doesn't spread much, **it often comes down to just not as much time searching for the right idea.** You're going with the first thing you have instead of really working on ideas and trying to wait till something really pops.

Navigating The Idea Maze

Michael:

Last year we did a course that helps people write blockbuster articles, and I was observing how people want that one thing right away, they want to get it as fast as they can, and when it doesn't go as well, it's really demotivating. Or, you feel a tangent, but then you don't want to

pursue that new idea. How do you manage that process of going through the idea maze and conceptualizing it? Is it like a tree where certain flowers bloom?

Cal:

It is. It's helpful to have **good capture** because it's going to branch enough, you're gonna have enough dead-end ideas, and you might come back to them. You need a place to collect all these notes. Otherwise, you're gonna get frustrated and you're gonna lose things in your mind. I use Evernote for that purpose. There's so many different topics I'm looking at and so much information I'm collecting, I need something at that scale to be able to capture everything. That alleviates a lot of stress. You can read something or think about something that's relevant to this idea that you were thinking about a year ago but haven't recently — you have a place for it, it drops in there. And if that gets re revivified at some point, you have everything collected there. Collecting the information in a really organized, scalable fashion helps you navigate these mazes of ideas.

The other thing that I think is important, especially in terms of coming up with good ideas, is a piece of advice from the public radio host Ira Glass. He really emphasized that **developing taste** is one of the most important things to actually developing good ideas. What he means is developing **your ability to assess how good an idea is** has to be a crucial precondition for coming up with really good ideas. Otherwise, you're just shooting in the dark. But if by studying people who produce good ideas in the field you care about, understanding why they're good ideas, by having a great intuitive sense of "This is a blockbuster but this one isn't", by having that taste be refined (which is just practice, experience, and exposure) — means that you're much better able to filter your own ideas and figure out if it's not quite there yet. And as your taste gets better by doing that practice and exposure, it's gonna take longer for you to get ideas that you're happy with because the bar is raising and raising — but the power of ideas you accept will get better.

To put those pieces together: you're collecting information from lots of sources using something like Evernote to keep it organized, and you're systematically exposing yourself to the very top examples in the field you care about.

This is how I got started in writing. I used to deconstruct Gladwell, Clive Thompson, a few other long-form nonfiction writers that I liked, and I would deconstruct their articles. I tried to understand what made the articles good. It worked really well. It was a taste-building period that I think was really important to get me toward a place where I could start doing hardcover nonfiction writing myself.

Michael:

I actually do remember specific conversations in college or right after college. You were talking about how, on the one hand, you have someone like Gladwell who's all about giving these big ideas, and then, on the other hand, you have the self-developed people who are more "how-to". And it's almost like the Gladwell-type writers get right to giving you advice, but then they pull back like they have aversion to giving advice, but the point is to have big ideas *with* self-development.

Cal:

That's the whole secret to my perspective. I'm one of the only people trying to have a Gladwellian-style quality and yet still unabashedly have advice. I think it's starting to seep out as a more popular thing. But actually the book Deep Work is actually a format that is very hard to categorize (and you don't realize it unless you're a kind of an insider in the industry). You just don't see that format where Part 1 is sort of pure journal nonfiction idea style book and in part 2, there's "Here's how to build your calendar, here's how to do this." And yet the advice itself is surrounded by Gladwellian type stories. It turns out that format is really not that common. You either go one way or the other. No advice at all because that's beneath you or it's all bullet points and rhetorical questions. The merging of the two has been my plan since 2004.

Developing To The Next Level Of Performance

Michael:

It's funny how for a lot of things you're doing now, the wheels were already set in motion almost 17 years ago. But the execution is interesting, just a little bit of effort every day while you're doing school full time or teaching full time, just a little bit of learning time every day, and then deconstructing, and then figuring out your format and just sticking to it.

Cal:

That is another useful point to emphasize. To get to a really high level of accomplishment — and by high level I mean on an unambiguously accepted scale, for example in writing, are you a New York Times bestseller; or in academia, are you tenured at a good place? — there are almost always these timescales that are maybe a decade or so, in terms of focused effort applied consistently with diligence (by which I used the Steve Martin definition of diligence, which means not just returning to the same thing but being able to consistently limit other

things from your search). **A decade or so, that is the window of consistent effort on something it takes to have a shot of getting at a certain level.** I think people under-appreciate how much time is required to just develop to a certain level of performance.

Michael:

It took you 17 years to get where you are, and it's the same thing for me. I know a lot of people just aren't willing to do that. I think that it means **prioritizing something over and over that's not urgent.** It's never the most important thing that you have to do — to write a blog post, or to read a book or something. How did you go through it? You have 3 kids so it was going to school full time and doing work full time through having kids. I know that even when you didn't have kids, you were stopping work at 5 and not working the weekends. How did you find the time and what was the mindset that allowed you to just put that little bit of time over 20 years?

Cal:

I was always a big fan of what I called fixed schedule productivity, which is what I call a "meta productivity tip". You start with one fixed rule, and in order to satisfy it you're going to have to innovate lots of other small productivity habits. For me, when I was starting as a grad student, we had complete flexibility. I said I wanted to work roughly a 9-5 schedule as I wanted work to be congruent when my wife was at her nonacademic job. So, I just worked backwards from 9-5, which is when I want to work. That's pretty easy when you're a grad student because quite frankly, it's easy to be a grad student. But I kept that rule in place as I worked up from grad students to postdocs, and from postdoc to faculty. You have to work backwards from that rule and say, "How am I going to get all my work to fit within 9-5?" It's multi-level planning. I remember you and I talking about this in college in 2003 or 2004, about

this realization that we put off a certain amount of energy every day. You can almost measure it, how many calories you burn, that's what you put off. The more you can focus it, the more you're able to produce things, and the more diffused it is, the less you're able to produce things.

You can start at a very strategic level, for example "Where in my career am I trying to go?" This strategic level is going to inform the quarterly level plan, or semester level plan. For non-academics, you could think of this as seasonal planning, roughly fall, winter, spring, summer-type divisions, and have a plan for that. "What am I trying to do in this semester to move me forward on the strategic goals?" Academically, it might be: "These are the specific research endeavors that I'm trying to make progress on or submit at these particular

submission deadlines." In the world of writing newbies, maybe: "I'm trying to produce this article for The New Yorker / get this far in my book," or something like that. Then you go down to the weekly level from there, where you look at the week ahead of you and you're moving the time chess pieces around. What's going on, what's on my calendar, where is there open time? And you start to see when you're gonna have to do various things to make the progress you want to make on your quarterly goals.

Then, when you get to the individual day, you look at the weekly plan, you know roughly what you're supposed to do that day and you plan your day. I'm a believer in time block scheduling. Don't run your day off of a to-do list. Don't run your day off of reaction to what came into email, or to something else. Give every minute a job. "What am I doing from 8-8:30? What am I doing from 9-10?"

Take your time and allocate it explicitly. This gives you about 2x productivity improvement over reactive or to-do list-based scheduling. It's much harder. It's from a cognitive perspective. But the reward you get for that is you produce about 2x more results.

That's the whole scale I worked out. When I get to 1:30 on Wednesday, I know exactly what I'm supposed to be doing and I can trace that decision up a chain of plans that gets me all the way to a big-picture strategic vision for my career.

Flipping The Productivity Switch

Michael:

I feel like everything you said was very logical, and I also feel like 99.9% of people, they could hear the system but just aren't going to follow it for whatever reason.

I have a question for you. In high school, to me, you were always very smart and I respected you on that level. You were a typical high school student, I remember us rushing to do the homework at the beginning of the class and stuff like that. And then in college, you switched to become this person who knows exactly what they're doing at 1:30 on Wednesday, and you actually do it all the time. That might be surprising for people to hear that you weren't always like that, so how did you make that shift?

Cal:

It was a big shift. If you remember, our junior high school used to give student awards, jokey ones, and I won the 'homework and home run' award. I was smart and we were doing

interesting things, but you're right, we were both procrastinators on schoolwork. And I don't think I was a straight-A student but I did well.

For me, the flip switched after my freshman year of college.

I went to college and I was doing the same things, more or less. I got involved in the rowing crew. My grades were up and down, not terrible but not straight A's either. I had a heart condition. It was congenital, sort of out of nowhere, like a rapid heartbeat. The long and short of it is I couldn't be in the rowing crew anymore, so I had to make some decisions. What do I want to do instead? That's where I decided I'm going to get serious about 2 things: computer science and writing. This was 2001, the summer between my freshman and sophomore years.

This decision was partially driven by student loans. After that first year you see the first student loan statements and you start doing the math. How much am I gonna owe? So, I just flipped, I'm gonna get serious about these 2 things, and the things that were taking up my time, like business and rowing, went away.

I ran a series of experiments and a lot of them took place during the fall of my sophomore year. I thought, let me just be systematic. How do I manage my time? How do I study for this type of test? How do I take notes? I launched a series of systematic experiments to figure that

out, partially influenced by the business books I read. We've been running a business since we were 16, and we were used to reading business advice books (unlike almost all other college students). This was just my mindset, this is the way we thought.

Michael:

Yeah, that entrepreneurial experience has had such a big imprint on our lives.

Cal:

I ran these experiments and found better ways to do schoolwork. It turns out that most college students are just terrible at being college students. I didn't get it at the time because we had this weird upbringing as entrepreneurs, but for most 19-year-old college students, they have no exposure to that and they're just terrible students, hugely inefficient.

The result was, starting my sophomore fall I got a 4.0 every semester until my senior spring where I got one A- and ended up with a 395 GPA. I think that's crazy, that's 6th out of 1,000

students in the class. My work time had plummeted because I decided to treat college like a job that I'm trying to optimize and figure out the best way to do it. It turns out it's actually not that hard to be a student if you come at it with the mindset of a non-student.

That's what kicked it off, and that's what led me to my first book. The pitch was very simple: I want to write a student advice guide but with the tone of a business advice book. Looking back, it's obvious that someone like you or me would write that as someone who had a big experience as an entrepreneur before trying to be a student, so it was very natural. We had read all those books and I just said, let's take one of those books and write it that style but with student advice, so that's what also kicked off my writing. It was a one-semester switch and it happened right after my freshman year.

Michael:

It's really interesting as we're talking about it, since we have that shared history and you could see the threads in each of our lives from very early experiences and how the little things had a big difference. I've taken a very deconstructing approach to writing as well, I've spent hundreds of hours just going through what is the most viral content and dissecting the patterns.

One thing I also found interesting, I remember you not being very good at hand-eye coordination type of sports, but then we did track and I remember you were really, really good at the 400 m, but you would throw up at the end of every race, like you were pushing yourself so hard. I never asked you about this. Was part of your success the fact that you were willing to push yourself harder in that moment? Was that a big part of your career success and your mindset?

Cal:

That is a good question. The track was like a Greek tragedy because I had to throw up after every race. We were sophomores on the team, our top 2,400-meter runners got injured so if I didn't run that fast, I couldn't win. But I didn't throw up in the rowing crew, I was good at it. I guess I was more comfortable with the pain. There might be something there. I'm very used to this idea that anything useful is hard. Discomfort is not necessarily a bad thing. It's a sign that you're probably putting in the right amount of work. Maybe that goes all the way back to that terrible experience.

Michael:

Related to the input phase, we have a question from the audience: approximately how many books do you read per year on average?

Cal:

It's a little hard to say because if I'm writing a book, for example, there might be a chapter where I have to quickly go through 10 or 15 books in a relatively short amount of time. But if I'm outside of book writing, I'm reading less. My rule of thumb is I'm working on about 5-6 books at a time, books that I'm actively making progress on.

Some books you can skim very fast. I got very good at reading certain parts and skimming other parts. When I'm pulling information, I use a pencil. If there's something useful on a page, I mark a corner with a pencil so I know there's something on that page, and then I directly block out with the pencil the things I liked from that page when I mark up a book. This way it's very simple to go back and extract information. You flip to the marked corners and then you zone in right to the marked passages on those corners. It's minimal friction on the effort. Then you can go through and review a book, and usually, once you've done that, later it takes about 15 minutes to come back and pull out all the information that's useful. Sometimes I'm just moving really fast, marking, and sometimes I'm reading more for pleasure. If it's difficult, I'm going very slow, but I read at different times of the day and I switch between different types of books.

Michael:

I'm going through a phase right now. I feel like there are different phases where it's more a paradigm focus: I get really fascinated by something and then I'm reading everything on it, I can figure out what the best pieces are, and then I'm skipping parts because a lot of it's repetition. At some point I get bored by the topic and I feel like I'm hearing the same ideas over and over, and then I'm looking for the next paradigm to go into.

What do you think about selecting the “pocket” of information to go into? And also, how to find the best information in that pocket?

Cal:

It's good to bring it up because I wander a lot as well. I'll wander into a topic and read on it until that burns itself out. The exception where it's more focused is when I'm working, let's say

on an article about a certain topic and then I'm buying books that are exactly about that, I'm going through a lot of books on this topic, but otherwise, I wander as well. I try not to worry too much about that. You let your interest allow you to wander.

I think clusters are very common. You like something and you read 3 or 4 more books about it, surrounding the topics. Sometimes you'll go really deep, like I've gone really deep on the philosophy of technology for obvious reasons, and eventually what happens is it all just becomes circular. Everyone's referencing what you've already read and then you know you have this topic down pretty well.

Practice In A Way That Stretches You

Michael:

There's a really awesome book, it's one of my top 10 books called Why Greatness Cannot Be Planned and it's making the case for the value of curiosity as a filter. A lot of times it's very easy to only have goal-based filters, like "I want to accomplish X, Y, Z goal, what do I need to make it happen?" But the curiosity-based filter is a big one. It's hard to do because you don't know where it's going to go and how it is going to pay off, you just follow these threads

through and curiosity, or novelty, is what's going to inform your next steps and help you choose the threads to follow.

Cal:

This is actually a really interesting point and it's a really tough question. A lot of people recently asked me about my friend Dave Epstein's book, Range: Why Generalists Triumph In A Specialized World, there's a similar idea of **non-specializing but being exposed to lots of things that can help down the line,** set you up for success in ways that are really hard to judge in advance. My readers are trying to make sense of it — what does that mean in terms of diligent focus, deliberate work on skills? How do you square that with the idea of being exposed to lots of things as you don't know what reconfigurations in the future are going to be like, the new thing that you can't plan for now because it doesn't exist yet...?

I think it's a really interesting but complicated question and it's something I've been thinking about a lot. A couple of things I've thought about:

1. Even when you're exploring, when you want to learn this and that and see how things come together, it's still hard, deliberate work to pursue these individual directions. This

is what Dave would say in his book. Tiger Woods just focused on golf from a very early age, but look at Roger Federer, he did a variety of sports, he wasn't an early specialist and that ended up giving him a general athleticism that was really important for his career. That's seen as the key metaphor, that's a dialectic at the core of Epstein's book, the Tiger Woods model and Roger Federer model. If you look at the Roger Federer model, he worked really hard at each of those sports. It's not like it was “Oh, I didn't have to do any sort of training or deliberate work, I just sort of did what was fun and ended up a great tennis player.” He played a variety of sports and worked really deliberately at each of them to do them well. I think something like that is relevant. **You can explore various things, but explore them at a quality level.** Actually master it, actually build the skill.

2. There's also diligence. Things get hard because, as I was saying before, a lot of high-level performance requires about a decade of being in various fields.

I don't quite know how to square that with these other models. I think within a general field, there can be a lot of exploration — for example, if you want to be a writer, you can be exploring a lot of different topics but that's all within the 10-year push to become a high-level writer. There's also the T-model: you're exposed to a lot of things but when something seems specialized, you give that a lot of specialized attention.

Michael:

The 10,000-Hour research is done on a lot of fields where the rules stay the same, as chess or sports or things like that, and then there was another study comparing how much explanatory power it has across disciplines, and one of the big things was that it had less impact in the professional world.

New fields are emerging all the time. Right now people are becoming experts at the Coronavirus as it relates to what you can do for education or for business, but since it's a new thing, no one has 10,000 hours in the field. I think it depends on a lot of factors and how quickly the field is changing.

Cal:

Deliberate practice is looking at people going to an elite level in a variety of pursuits and how many hours of deliberate practice they require. The average was 10,000 hours. I know Ericsson and I've talked to him about this. The key to his study, the deliberate practice theory, was that before it came along, it was a pretty big open question of how people get better or

really good at things, and there were a lot of competing hypotheses. One of them was Expert Knowledge theory: is it about learning about the thing? If you really understand something better, does that make you better at it? It didn't quite seem to explain it. Another was repetition: if you do an activity enough times, you get better and better at that. But that didn't really seem to explain it either.

The best expository factor for how people actually get better and get to elite levels is that you don't just learn about something, and you don't just do something — **you actually have to practice it in a way that stretches you** to make you better. That's the core idea of his theory. He's kind of a victim of his own success, though, because now we've all become used to that and started looking into the hours.

This got filtered through Gladwell into the popular world to be some notion of “practice is all that matters". In academia, we call this the extreme version hypothesis, when there's no natural abilities, and that didn't seem quite to square. Dave Epstein's prior book The Sports Gene was about all the things in sports where it’s not just practice that matters. For example, your height does matter if you're gonna play basketball no matter how much you practice.

So, it wasn’t 10,000 hours in each and every case. In some fields it's less than that, and in other fields, other factors seem to play more of a role than the practice factors.

I think it's all a distraction from what's underlying truth. I think the important piece is if you wanna get better at something, you have to practice it in a way that stretches you beyond what's comfortable. That's the takeaway for people, in knowledge work careers in particular. David Epstein called these “wicked environments”: there aren't clear rules, and almost no one is induced to actually do this type of deliberate practice. “I'm an executive that's somehow going to find ways to stretch myself.” For a chess player it’d be very natural: they’d set up these exercises to stretch themselves, get a coach, the whole field is almost set up at the elite level for deliberate practice.

I'm convinced in the world of knowledge work, deliberate practice is an opportunity. Not that it doesn't apply, but that no one is applying it. Ironically, one of the people who is applying it is Josh Waitzkin. A part of how he makes a living is coaching others. He focuses a lot on hedge fund managers, or people where there are just incredible stakes on their knowledge work performance, and he trains them on how to get optimal performance out of their mind, how to do their work at the highest level. It makes sense. That's the first place you would see this, because for these managers, there are billions of dollars on the line. To be okay versus to be great could mean a difference in a hundred billion dollars profit. So interestingly, it's a chess player who is bringing this idea over to the world of knowledge.

But that's one of my big arguments. There are these wicked environments where it's not super clear exactly how to train to be X (a better computer programmer, or marketer, or software entrepreneur). We do know that the mind requires systematic stretching to get better, and almost no one does that purposefully in knowledge work, almost any of that growth that happens is accidental so I think it's a huge opportunity.

Long-Term Productivity Prerequisites

Michael:

I've thought about it a lot, how to structure my own day in that way with coaching and helping others, and I think one of the big challenges is the paradigms and mindsets we bring to it. If you bring a short term productivity focus, where you have your daily to-do list and success at the end of the day is completing your to-do list, if you don't complete it, you're gonna feel guilty. In that kind of mindset or paradigm, if something surprising happens during the day there's a conflict instead of it being an opportunity to resolve the conflict. The natural thing to do is to step over that and decide to deal with that later so you don't get distracted.

I feel like one of the prerequisites before you can even apply deliberate practice is going into this learning paradigm where you're thinking about what you can learn, what are the learning opportunities, how to extract the value from it.

Cal:

You're never going to email yourself into the corner office, righ? That seems like the right way to think about it. Rare and valuable skills are the currency of career mobility, career motion, entrepreneurial success. What can you do that's rare and valuable? That requires you almost always to do a sort of deliberate development of those skills or deliberate development of your assets. Understanding what those are, what's important, what are the opportunities, requires a widespread exposure to learning opportunities, to information. You see this a lot in serial high achievers, that they have these long fallow periods during which they're exposing themselves, learning, picking things up. It's like the Elon Musk model. When he got interested in rockets, he learned rocket physics, which is not easy to learn. That wasn't wasted time. From the outside it could look like he has done nothing since PayPal, he got this big buyout and he's doing math classes and talking to rocket engineers. But we know how that turned out.

Or, take Facebook: you're not going to make yourself into a billionaire by being really good at using Facebook. You're going to make yourself into a billionaire by doing what Mark

Zuckerberg did, which is getting really good at how you build something like Facebook. That's focused energy, that's rare and valuable skills. It's mastering complex new types of distributed systems and understanding that's the type of activity that leads to really big results.

Understanding Before Acting

Michael:

I've learned a lot from coaching people and teaching live online courses. I observe what people do, what causes them to take action, and I've really seen how few people actually take action on the hard stuff day in, day out. In writing, for example, how many people are actually doing the research and then publishing, and can support that for months or years through all the emotions that come up?

It relates to what we talked about before, accepting that a life of that pain isn't a bad thing, and embracing it. How important do you think that part is? I feel like many people get stuck in getting knowledge, but not actually applying it.

Cal:

I think this is an important point because I've long felt that we underappreciated the difficulty of getting to a point where you're able to consistently invest in something over a long time. When I used to do student advice stuff and give talks to colleges, I used to have this idea which I think is true for a lot of students. For example, procrastination is your mind's way of saying “I don't trust your plan”, so when students say “I'm procrastinating on getting started on my paper”, it's a natural instinct. That part of what separates humans is that we can actually build long term plans (instead of just reacting to particular stimuli), and then we can go execute long term plans.

But how do we figure out which plans to go after? Because, of course, it takes up energy to do things. Our brains are very good plan evaluator machines. If a plan seems like “In my experience, I really believe this is gonna get us some more meat for the tribe”, then you'll be motivated to do it. But if you’re thinking, “I see that mammoth over there, maybe if I run over there and jump on its back I'll be able to take it down…” — then your mind sees it as a bad plan, it’s going to demotivate you, try to inspire you to procrastinate on this because you're going to end up with a tusk through your abdomen if you do that.

I think that really applies in these types of professional pursuits we care about today. It can actually take a lot of work to try to really understand the field well enough so that you're

confident that your efforts are going to get you somewhere that you want to go. So sometimes when you procrastinate on taking action, it might be because your mind is not really convinced that you know enough about it, or that you thought it through enough.

Understanding Gives You Motivation And Confidence To Follow Through

Once I went and looked at the New York Times article on 10 best fiction writers, and about 90% of them had gone to elite MFA programs. My conclusion is that it's not something that you learn in an elite MFA program that gives you some skill that you wouldn't have otherwise that enables you to be a great novelist, because we had plenty of great novelists before these programs existed. I think what the elite MFA programs gave them was confidence: “Oh, I see how people become elite writers. I know it's possible for me to become a great writer. I see what the process is like.” That was like a precondition for potential, putting in the effort to become a great writer.

When my friend Scott Young and I did this course on top performers, on getting better in your career, we ran through a lot of pilots and we ended up dedicating a huge portion of the beginning of the course to trying to figure out what to put your energy into.

This is a long answer to a short question — basically, you probably need to spend more time than you think understanding.

This is hard because this stage could procrastinate you forever, so you have to have a balance where you don't just jump into something randomly because your mind's going to shut that down eventually. On the one hand, you can’t just say: “It's national novel writing month, let's do it. I'm gonna be a novel writer.” On the other hand, you could wait till you're 50, thinking about this dream forever and not pulling the trigger. That's also bad. It's all about this sweet spot in between: “Let me meet some novelists. Let me do some short story writing. Let me understand. Let me talk to a publisher.” You put together this picture and then you get how this works and now you have some confidence. That's often the foundation for consistent application of effort.

Michael:

I remember, at the time we didn't know a lot of young entrepreneurs. At times we came across good entrepreneurs who would accomplish this thing that we thought was magical, and then we spent all this time deconstructing it and then we got this feeling of confidence that came from understanding how it works.

Cal:

When I decided to write my first book, which I sold right after my junior year of college, I threw a family connection and got a phone call with a literary agent. I told her: “I'm not trying to make you into my agent. I just want to learn what would be required for someone like me, a 21-year-old, to successfully sell a book. How does this work?” She walked me through the whole thing: this is what we'd worry about, this is the process... I learned about it, and that enabled me to turn around and be very motivated to consistently put in the effort to sell and write the book because I understood the world enough. If I had instead decided to write 1,000 words a day or something like this, it would not have gotten me very close and I probably would have run out of steam at some point. I had the intel.

Michael:

On the other hand, if people really knew how hard it was, how long it took and how few people actually go forward, I could see a lot of people being really demotivated or, at the very least, not very excited about it and thinking, “Let me choose a path that’s just seemingly easier, even if it's wrong, but somebody is telling me I can become an overnight X, Y, Z. I'm just gonna go with that. I do the short, easy path rather than the long, hard path.”

Cal:

Yes, “I could be a nonfiction book writer but I could also be an Instagram influencer and the latter seems like it's going to require a lot less time.”

In the book I wrote in 2012 I call this the “autonomy traps” and it's really the key thing for building up rare and valuable skills that you have this double sided trap. There are two ways you can go wrong:

1. **You make the big bid for a lot of autonomy and big things happening before you understand it enough to have enough skill.** Situations like “I quit my job and I'll figure out my online business later” but you don't have enough knowledge or skill for it to succeed.

2. **Once you have a lot of knowledge and skill,** especially in the context of leaving your job to do something else, **you are going to have all these forces to try to keep you in place.** It's very tempting to keep delaying before you actually leverage and apply that skill to do something new.

The whole game is figuring out how to navigate between those two traps — not just pull the trigger randomly, but on the other hand, not to spend the next 15 years thinking about how you're going to do this one day.

How To Make Sure Your Smaller Goals Are Plausible

Michael:

I feel like the goals thing is really, really huge. We have a mental model on goals, because an observation is that a lot of people don't put a lot of time into understanding what makes a good goal. You could spend 5, 10 years pursuing a goal and when you finally get it you realize that wasn't it and you sacrificed all these things are actually way more important.

On the other hand, you can spend time upfront to come up with a really good goal. For example, Elon Musk spent his teens reading hundreds of books on philosophy and religion to create a meaning of life, so the Why that he figured out, the goal, has actually remained very, very consistent. So you can have this flywheel of getting more and more momentum to it rather than changing it all the time. How do you think about how to find goals that have that long term staying power?

Cal:

It's a good question, what makes a good big-picture goal. I think generality plus suitable motivation.

Also, when it comes to hanging smaller goals off of the big goal, something that seems really useful is studying actual people and what they did, like a journalist. For example, as part of this bigger goal I want to start a business, or I want to publish this, or I want to make an invention. One of the most important things you can do is to study people who do that or have done it in a way that resonates with you and what you want to do. And then, like a journalist, set out to really understand this person and their path to the point where you might be getting him or her on a call to walk you through the process.

A key piece of advice here, of course, is never to ask people for their advice. Ask them for their story. This is the way it's a journalist's method, get the data and then you can figure out later what was important from it.

Use real people who have done something that resonates to understand the pattern and to find out what was important. That's great for figuring out the smaller goals that hang off your

big goal to make sure that they're plausible, and you also have a pretty good understanding of how to actually get there. See your professional world through the lens of a journalist, set out to understand how people in this professional world succeed in various ways, what their steps were where they veered off the normal track, what was the key turning point — almost as if you're writing sort of business biographies about all these people. It really helps you set concrete short-term goals that you can hang off of whatever your larger flywheel goal is.