Welcome to the Huberman Lab podcast where we discuss science and science-based tools for everyday life. I'm Andrew Huberman and I'm a professor of neurobiology and ophthalmology at Stanford School of Medicine. Today my guest is Dr. Emily Bouchettis. Dr. Bouchettis is a professor of psychology at New York University. Her laboratory studies motivation, goal setting, and tools for successful goal completion. I learned about Dr. Bouchettis's work some years ago because I'm a vision scientist. That is I study the visual system and I heard about this incredible psychologist at New York University who was studying how vision that is how we visualize problems can predict whether or not we will successfully overcome challenges and how we strategize in order to set and meet goals. And in 2020 I learned of Dr. Bouchettis's book which was written for the general public entitled Clear Closer Better, How Successful People See the World. And I read both the hard copy of the book and listened to the audio book and I absolutely loved the material. As you'll learn directly from Dr. Bouchettis today, how people visualize a problem that is whether or not they think of a goal or a problem as residing at the top of a very steep hill or on the top of a shallower hill or whether or not they visualize a goal or a problem as far off in the distance or closer to them in the distance visually in their mind. And it strongly dictates whether or not they will arrive at the challenge of meeting a goal or overcoming a problem with more energy or less energy. Indeed, it dictates whether or not they can push to immediate milestones or whether or not they will think they have to overcome the entire task all at once. Basically, Dr. Bouchettis's work has discovered that how we visualize a problem or a goal in our mind has everything to do with how we lean into that goal, whether or not we think of it as overwhelming or tractable, whether or not we think that we can overcome that goal and then it will lead to yet more possible rewards and goals or whether or not we feel that we're going to arrive at the finish line and then just be overwhelmed with fatigue. In other words, how you visualize things in your mind and when I say visualize, I mean literally how you visualize them as a visual problem or a visual goal has everything to do with whether or not you will be able to meet those goals and whether or not they will lead to still greater goals that you will be able to achieve. Today's episode is especially important one I believe because you're going to learn about quality peer reviewed science from the expert in this field of goal setting motivation and pursuit and you're also going to learn an immense number of practical tools that you can apply toward your educational goals, your career goals, relationship goals, goals of any sort. By the end of today's episode, you will be better equipped to set and achieve your goals. Dr. Bouchette also shares with us her own experiences of how to set visualize and achieve goals and she does that within the context of her role as a parent as somebody navigating relationships of various kinds and a demanding career. So again, I think that you'll find the information today to be both extremely academically grounded in terms of research, extremely practical and realistic in terms of how you might apply it in your own life. I'm pleased to announce that the human lab podcast is now partnered with momentous supplements. We partnered with momentous for several important reasons. First of all, they ship internationally because we know that many of you are located outside of the United States. That's valuable. Second of all, and perhaps most important, the quality of their supplements is second to none, both in terms of purity and precision of the amounts of the ingredients. Third, we've really emphasized supplements that are single ingredient supplements and that are supplied in dosages that allow you to build a supplementation protocol that's optimized for cost, that's optimized for effectiveness, and that you can add things and remove things from your protocol in a way that's really systematic and scientific. This is really hard to do if you're taking blends of different supplements or if the dosages are such that you can't titrate or that is adjust the dosages of a given supplement. So by using single ingredient supplements, you can really build out the supplement kit that's ideal for you and your specific needs. If you'd like to see the supplements that we partner with momentous on, you can go to livemomentus.com slash Huberman. There you'll see those supplements and just keep in mind that we are constantly expanding the library of supplements available through momentous on a regular basis. Again, that's livemomentus.com slash Huberman. Before we begin, I'd like to emphasize that this podcast is separate from my teaching and research roles at Stanford. It is, however, part of my desire and effort to bring zero cost to consumer information about science and science-related tools to the general public. And now for my discussion with Dr. Emily Belchettis. Well, thanks for being here. That's my pleasure. Yeah, I've been looking forward to this for a long time, because as a vision scientist, who is also very interested in real life tools and goal setting and motivation, your work lands squarely in the middle of those interests. So just to kick things off, you could tell us just a little bit about the relationship between perception and in particular how we see the world and goal setting and goal retrieval. It's a vast landscape, but you're the expert. So I'll turn that over to you. And then as time goes on, I may have some additional questions as it relates to different kinds of vision. But what's the deal with vision and motivation? How do those two things link up? Totally. When psychologists ask people, how are you doing to help make progress on your goals? They say all kinds of things. A couple of things always pop to the top, which is try to shock myself in encouraging ways, self-pep talks, or I remind myself of how important it is to do this job. Or, you know, I'll put up post it notes around to like constantly be nagging me about what I need to do. So those are common tactics that people use. What we'll notice is that those are really effortful. Happy to constantly remind yourself, having to constantly talk to yourself, having to create those post it notes. Remember to look at them. All of that takes a lot of time and effort and commitment. And so what a surprise that people burn out. Right. It's exciting to work on a goal. When you when you first set it, you might make some initial progress. But then eventually we get, you know, not even to the halfway point, but before things get real, things are challenging and we fall by the wayside. And that's I think because those tactics that are our go to strategies are themselves a goal to maintain. So it's like, you know, double-sided. We're putting so much on ourselves to try to advance the thing that we originally set out to accomplish. So then I, you know, with my team, I was trying to think of like, well, what are strategies that don't require as much effort that we can automate, that we can take advantage of what's already happening within ourselves, within our body, within our mind. That might overcome one of those challenges. That'll be easier, more automated. And that's when we started to land on the idea of vision. Right. We look at the world without even thinking of it or those of us that are cited. And we thought, you know what, there are strategies that we can use to look at the world in a different way and that we can automate that might help us to overcome some obstacles, to make progress on our goals, to maybe literally see opportunities that we hadn't been able to see before. So we started playing around with the idea of visual illusions to see, like do people even know that there's other ways of seeing things around them? Can we tweak that? Or is there room for intervention? Can we encourage people to take a new way of looking to see things that they hadn't seen before? And that's what really opened us up to trying to look at that intersection between vision science and motivation science. It's great. And I always say, and here I'm strongly biased as a vision scientist that vision is the dominant sense by which we navigate the world and survive. I love this idea of real world real time access to vision. And I'm certainly familiar with how goal setting or post it and magnets on refrigerators can have an immediate impact but then over time they become so part of the visual landscape that you overlooked them. And we know as vision scientists, if something is stably in your environment, eventually you're blind to it. So that makes good sense. So you've published a number of studies in this area, but maybe you could highlight some of the more what you would consider important findings in the area of how people can adjust their vision in order to meet goals more quickly and more efficiently. And perhaps also how we come we all arrive at goals with different visual perceptions and that in some way may divide us into highly motivated and less motivated people. In other words, what's the link between vision and motivation and how can we leverage that in order to better reach our goals? So, you know, we started thinking about what are the goals that are most important to people that they struggle with the most. So we asked hundreds, thousands of people what their New Year's resolutions are. We looked to all the other polls that do the same kind of work. And regardless of where you look or who you ask or when you ask it, people's number one goal is something related to their health, right? To lose weight, to exercise more, to get out, get more steps for mental well-being, physical well-being. And that's like the number one goal every January first. So if we were able to accomplish that goal, you think it would drop a little bit in the rankings, but it doesn't because it's really hard. So we thought, I wonder if there's a way for us to make some progress on that, on helping people to exercise better, more often, stick to it longer, and make some progress there. We know diets don't work and why don't diets work for the same reason that that self-talk doesn't work is that we go in it full bore, hard core, and it requires a major commitment and effort to a lifestyle change. So again, we were looking for something that might be easier than that that could produce big, big payoff, right? That's the golden ticket, something that requires less effort for a bigger payoff. So one of the first things that I did was go over to Brooklyn to this old armory building. It used to be a military armory space. I know that building. It's a beautiful building now that houses a lot of businesses, right, with plants on the walls. Yeah, there's businesses. There's a couple armories all around the burrows here around New York City. And one in Brooklyn in particular is now YMCA. So it's a family YMCA that's within as beautiful old red brick building that used to be a military establishment long, long ago. And what's really cool is that one winter after afternoon, somebody had invited me a physical therapist said, hey, you should come out and check out what's happening here with your interest in exercise and trying to find new ways of helping people, new tactics that they can add to their tool belt. I think you're going to find some interesting people that are working out there. So I showed up, I look around, there's families, there's new moms, there's kids that are moms trying to get kids to burn off some winter energy that they have. There's people that look like they're just there for their, you know, every couple of days going out for a run. There's some people that look like they're training with a team. And that's who this physical therapist introduced introduced me to is that was the coach of this team. There's a bunch of people that were sitting down on the ground. And I would be hard pressed to know who's the high school student that's in this group. And then who as it turns out are some of the fastest runners in the world. Like, you know, one of the people that was in the last Olympics before I showed up when the gold medal for the 400 meter. And from the looks of them, I mean, of course their bodies are in better shape than mine. But there's nothing so pretentious. Of course, they're not wearing their medals. There's nothing pretentious about how they're walking around or anything like that that would lead me to know like this person's amazing. And they probably have some insight that I don't have. So once I got introduced to them and knew who are these people that were part of this pretty elite training team that happened to work out at this family gym. I had the chance to talk with them about what strategies do you use? Now, I am not an elite runner and having recently had a baby, I'm not really a runner right now at all. But I thought when these people are running, I bet they are like hyper aware of everything that's going on in their surroundings. Where are they relative to the competition? What's happening in their peripheral vision? What's going on on the side? Who's behind them? Who's in front of them? They probably have this like master sense, this master visual plan at any point in time. And that's what probably makes them elite. So when I started asking them, is that the case? Do you really pay attention to what's in your surroundings? What's behind you? What's on the side? They said no. Like all of them said no. And sometimes when I do do that, it's a mistake. It doesn't work for me. So that was surprising. I'm totally winning against my intuition about what they do that likely contributes to their success. What they said instead was that they are hyper focused. They assume this narrowed focus of attention, almost like a spotlight is shining on a target. Now when they're running a short distance, that target might literally be the finish line, the line that they're trying to cross. But it's a longer distance they set sub goals, like, you know, the person, the shorts on the person up ahead that they're trying to beat, or they choose some sort of stable landmark, like a sign that they would pass by. And like a spotlight is shining just on that, or like they have blinders on the sides of their face. That's all they're paying attention to. And that was a strategy that they, that all of these elite athletes said that they used in those that were better rather than, you know, the slower were ones that used it more. And I thought, oh, that's something they can play with, right? Like they are elite and they are accomplished. But that visual strategy isn't necessarily something that you have to be in the perfect physical condition to be able to adopt. And that helped the rest of us who aren't competing for an Olympic gold and who have no chance of ever getting one, but who want to exercise better have a better, have a better time doing it and maintain a commitment to that exercise goal that they might have that they might otherwise, you know, by February or March, be giving up on. If they had said it at the beginning of January. And that's really where the work started was, you know, what you might call like focus groups or case studies of these incredible athletes. And, and then we did other studies looking at, you know, you know, people who are an Olympic athletes, but who are competitive and New York roadrunners. Runners and how are they running in races and what we found is that those people have better pace faster pace better time. And that narrowed strategy more often than this more expansive or, you know, open scope of attention. And there seem to be a correlation between that better performance among a wider swath of hundreds of of runners who are doing it competitively, but still, you know, could be like the person that you're sitting next to in the office or yourself. And the more often that they did it, the, and the more consistently they had adopted that that technique of the narrowed focus of attention that seemed that they were doing better in their runs. So then we started thinking like, okay, what about people who who aren't competitive runners, what about my mom, can she can she do that or me when I'm trying to get back on the bandwagon and exercise more. Is this a tactic we can teach people the answer is yes, you can tell people about what these Olympic athletes are doing, you can tell them about what the New York road runners runners are doing. And just using the same language that I just use with you, right, imagine that there's a spotlight shining just on a target choose choose something up ahead the stop sign two blocks up that you can you can just see. And you know imagine that you're you have blinders on so that you're not really paying attention to the people that are passing by or the buildings or the garbage cans or the or the trucks that are on the road. You know tune those out and focus in on that target until you hit it and then choose another one right to recalibrate choose the next goal. And so we would test like can people do that. I mean, if you're listening right now, you probably are imagining that experience to and the answer is yes, like I can imagine that I know what those words mean and I can do that. And our work found that too, if people can do that, we have them say out loud, what is it that's captured your attention. And of course, sometimes something in the periphery like movement captures our gaze and we're pulled there for for an instant, but then we can refocus up again and adopt that narrow attention. And one of the first studies that we did was was teach that strategy and juxtapose or compare it against a group that we said just look around naturally, you know, you might see that finish line up ahead and there's things on the periphery, whatever your eyes want to do, whatever you think is going to work best feel free to do that until what you're looking at. Then we gave them a finish line we created sort of you know an exercise that's moderately challenging, but possible we put ankle weights on that that accounted for about 15% of their body weight told them to lift their knees up sort of high stepping to a finish line. So this would be challenging for them to do. But we said, you know, it's an indicator of overall health and fitness. Some of these people had narrow their focus of attention and some were just looking more expansively or naturally. And what we found is that those people that we trained every day normal people doing this this moderately challenging exercise, they were able to move 27% faster, they could do the exercise more quickly and they said it hurt 17% less. The exercise was exactly the same for all the people we set we set the weight and we set the distance. It was in, you know, our lab space so it was like constrained environment everybody was in the same sort of circumstance. But yet their experience was really different. We helped them to move faster burn calories at a higher rate right exercise more efficiently the amount of time they put in is going to produce a better physical outcome. Also, it didn't hurt them right they're saying it doesn't hurt as much. So we were really excited about that right because it meant that this strategy we could use it on people who are not elite athletes. It could be easily adopted a quick training session right can teach people to look at the world in a different way. Again, this narrowed attention was different than whatever they do naturally the comparison group. But it had a big outcome it had a big difference on the way that they were engaged in the exercise. It was like some of the first work that we did and then since then we've done you know dozens more studies to look at what happens with that and what else can we do with playing around with this. Yeah, those are impressive differences as a consequence of narrowing visual attention. A couple questions about the actual practice of narrowing attention. Is there any indication of whether or not subjects are constantly updating their visual attention. So for instance, if let's say the goal line is in view literally from the beginning I could imagine just holding visual attention on the on the goal line. But if it's a oval track or it's a trajectory along a trailer through a city. How often do you think they are updating their their visual aperture and setting a visual goal. And I could imagine that there's some energetic expense to that so that meaning how you know you wouldn't want to do every crack on the sidewalk unless those cracks on the sidewalk were very far apart. Right. Because I think at some point that itself would be exhausted. So is there an optimal strategy or a semi optimal strategy. Yeah, so you know those Olympic athletes that we that we started by interviewing they tended to be sprinters. They were more often sprinters short distance sprinters. So when they said like yes, I narrow in more than I assume an expansive focus that's because they're not going that far right they have to do it as fast as humanly possible but they're not going that far. So we started asking that question to about like wouldn't that be tiring and the answer is yes. So when we start to look at what people who aren't sprinters who are accomplished but who are more long distance runners that's what we find that they do is that they. You know they're using that narrow attention strategy strategically and it increases in use they use it more often as the race progresses and they really start to do this you know major switch. About the halfway point of say like a 10 kilometer run so people who are seasoned runners they really start making a switch with what they're looking at about halfway through. And that's where they more often more frequently and are more intentionally adopting a narrowed focus of attention when they're in the last couple miles of a run when maybe their resources are starting to get more thin maybe their motivation is starting to fade. That tipping point in the middle is with any kind of goal where people struggle the most and that's when they're like doubling down on a strategy that they know to be effective. So you know at first longer distance runners are not using that narrowed strategy there are they're looking more expansively. Because I think that that well first of all distraction is a thing it's useful not necessarily that they're distracting themselves because people are still trying to hold pace and jostle among probably a more concentrated group of runners. But it is a strategy that they use and then sort of ween off of as the race goes through and it's particularly effective. When we're looking for that last push right the last push to get over the finish line when like you might be literally neck and neck with somebody that you're trying to to just be out. Or when you're most tired but you know like that last push you don't want to you don't want to drop off. And you know you want to you want to push through hard through that finish line that's when people are using it at its peak level of intensity. I see yeah I to me this makes total sense why it would work without going down the the rabbit hole of visual neuroscience of something for another time. The when we do these virgin sign movements when we bring our eyes to a visual target it's clear that some of the brain stem circuitry for alertness gets engaged to a greater degree. The other thing is that we know that when we focus on an object that the the optics of the eye change and narrow the visual field. So that brings about this is a very detailed question but I'm sure the audience is wondering if let's say I'm focused on a goal line or or a intermediate goal. Are they focusing on a specific point or is it kind of the entire horizon of that goal because the finish line is indeed a line. So and of course this is it's impossible to know what someone is actually doing in their minds eye but how do people report this do they see it literally as a spotlight and if so how broad is that spot. Yeah so you know what is the the the length of of their aperture rather than the maybe the diameter or the fear the fear size of it. You know in our interviews with people are our sort of focus group studies it seems like it's more like a circular point and that's in fact what we're teaching people what we're training them to do so rather than going broadly looking across a line from left to right. We are encouraging them to like imagine a circle of light that's shining on some target now of course the finish line is a line but if they're staying in their lane if they're on a track right you can imagine that there is that there is a circle shining just on where in their lane they'll cross that finish line or if it's a stop sign you can imagine a circle of light illuminating that. So that's what we're teaching people to use and that's what seems to be effective to maintain that focus rather than sort of being pulled to engage with peripheral vision. And there's some amazing people some runners in history like Joan Benoit Samuel send you one of the first female marathon competitors who has won multiple marathons she's Canadian I think she's one feel free to correct me like 10 marathons in her life. And she talks about sort of not assuming this like this wide but narrow wide but not deep or tall attention focus she talks about like finding the shorts on somebody ahead of me and focusing on on those shorts until she passes them and then resetting that goal. So in you know her interviews that she's done with runners magazines she talks about it in terms of this the circle of attention. So I think I've experienced this a little bit because we're visiting New York not to do this interview and runners here seem more competitive recreational runners here seem more competitive walk people walking on the street seem competitive you're walking at near pace to somebody they'll quickly speed up few speed up they'll speed up I think there some studies about walking speed in different cities and New York ranks among the fastest walkers around I won't mention the slowest walking cities because we don't want to cast any judgments but fascinating and again makes total sense based on the way the the visual system measures both space and time something maybe we'll get into a little bit later but I'm curious whether or not this the whole thing works in reverse as well meaning people who are very motivated to exercise do they think this way naturally people who are averse to exercise or who find it hard to get motivated to exercise do they view the world differently literally yeah I have so much that I can say about this so if you'll humor me I'll give you a couple different stories about how we can answer that so you don't have to do a deep dive in a vision science which of course you are capable of doing but but what I can share with you is some like animal studies where this work kind of first started this is in the 1940s 1950s rat labs mice labs and they were looking you know those were the first models of of human behavior that people were trying to understand motivation motivation science within so they would you know deprived these poor rats and mice of food or water so that they were motivated to to get it they were hungry and they were thirsty and they had practice running a maze so they knew where they could find that food or water whatever that they were looking for and what these researchers were studying was the pace of of movement through the maze so as these as the rats were like going through the maze they found that even though these rats were hungry and they're having to expend limited caloric energy to make it to the finish line they actually ran faster the closer they got to that finish line so once that finish line became nearer to them they actually you know use their resources probably you know sub optimally to make sure that they cross the finish line and got their reward so that was like some of the first early work that that was showing that you know proximity to a goal increases the investment in in resources that people that animals use to meet that goal even when they don't have that much to spare and with the mice the same kind of thing you know they were they actually had these little harnesses on them they're looking at how hard to the mice pull to try to make it to the food or the water that they were trying to get and same deal the closer they got to to getting their reward the harder they were pulling even though they didn't have that that much energy to spare and they had already used some up getting to that finish line so that was that was that early animal research from the 1940s 1950s then spurred a whole wave of work in humans to humans do the same thing you know even when they're tired but they can they can see or they can feel that their goal is close do they double down and work even harder to cross that finish line either like a literal finish line if we're talking about exercise or metaphorical finish line if we're talking about any other kind of goal that people might have the answer is yes they called that the goal gradient hypothesis the closer you get to the goal generally the harder people and animals work to to finish that goal that's what led us then to think okay you know those rats those mice those people are seeing the finish line right and it's been there maybe seeing that finish line seeing that or to seeing the goal they're hoping to accomplish that is what's leading them to you know try harder to invest more so that they can finish it off what if we induce that illusion of proximity what if we can induce a visual illusion a visual experience that approximates what the real rats and mice were actually experiencing as they got closer so that is what is happening that's what's happening visually when we create that narrowed focus of attention when we tell people imagine there's a spotlight on the shorts of the person up ahead or the stop sign that you're seeing it induces an illusion of proximity that then is responsible for people trying harder walking faster feeling that it defied their expectations and that it wasn't as bad as they thought it would be so we do things like measure like measure their visual experience how far away is that finish line of course we can ask them to report and feed how many feet is it but that's challenging right like nobody really knows what what three feet versus four feet really looks like but but they do so we can ask them how many feet it is we also use these other measures of visual matching measures to know like that distance of the finish line looks about as far away as as this other target they're matching up their visual experiences so what we know is that inducing that narrowed focus of attention is creating an illusion of proximity that goal looks closer to them and then there's all kinds of downstream motivational psychological effects that happen from feeling like you're closer by by by visually miss perceiving that space it can have a really positive consequence so your first question was you know which way does it go does it go both ways that people who are better runners like happen to do this thing yes some of our research shows that that if they you know for whatever reason happened upon this strategy and continue to practice it they tend to be the better runners but we also know from our experiments in the lab where we take people who don't know about these strategies by a flip of the coin randomly assign them to either learn the strategy and use it or do whatever comes naturally to them we can create that illusion of proximity that has a direct and causal impact on improving the performance when they're exercising so yes it goes both ways but you can also teach yourself that you don't have to just rely on on luck luck of the draw for being a person who happens to be better at exercising or whose eyes happen to do this on their own before we continue with today's discussion we're going to take a brief pause to acknowledge our sponsor athletic greens also called AG1 I started taking athletic greens way back in 2012 so I'm delighted that they've been a sponsor of this podcast athletic greens contains vitamins minerals probiotics digestive enzymes and adaptogens it's got a lot of things in there that's actually the reason I started taking it and the reason I still take it once or twice a day essentially covers all my nutritional bases and the probiotics in particular important to me because of the critical importance of what's called the gut brain access that is neurons and other cell types in the gut in the digestive tract that communicate with the brain and the brain back to the digestive tract in order to control things like mood, immune function, hormone function and on and on whenever somebody has asked me what's the one supplement they should take I always answer athletic greens I gave that answer long before I ever had this podcast and it's the answer I still give now for all the reasons that I detailed just a moment ago if you'd like to try athletic greens you can go to athletic greens dot com slash huberman to claim a special offer they'll give you five free travel packs to make it really easy to mix up athletic greens while you're on the road plus a year supply of vitamin D3 K2 which are also very important for a huge number of bodily factors and brain factors that impact your immediate and long term health again that's athletic greens dot com slash huberman to claim that special offer the most pressing question I have in my mind is can we I all of us use this strategy to make the starting line a goal point because for a lot of people it's not about going from start to finish it's about getting to start and you know I would say here I'm estimating but 15% of the content on social media is about motivation and how to get motivated to do things and the more chemicals like dopamine of course being at the heart of motivation I in my mind I'm making strong links between some of these visual aperture effects and goal lines and dopamine that we could also dive into but the simple question is can I use this finish line strategy to make the start line a goal and get my system more engaged or motivated and is there any physiology or physiological changes I should say to reflect the idea that maybe just visually focusing on the start line would actually get me more excited as opposed to make me less excited to engage in effort there's certainly vision science that's tied up in that very first stage of goal setting like identifying what that goal is in the first place and taking those first steps a lot of people's go to strategies that involve vision are vision boards or dream boards or you know post it notes right they're creating some sort of visual representation of what it is that they want to accomplish where is it that I want to be in five years ten days ten years whatever whatever that timeline is that they're working under the idea of vision boards or dream boards is that you like you know almost like scrapbook collect visual icons that reflect where you want to be to motivate yourself it's a really common tactic that people use and it's not bad to do that right for some people just even knowing what they want in life is a major accomplishment defining the goal can be really challenging for people and that's a strategy that works and involves our visual experience right it's not just people aren't saying like why don't you just sit around and imagine what you want your life to be like in ten years the strategy that people are suggesting is like no cut out the pictures put it on a board and stick it by your bathroom mirrors so you see it every day right make a list make a list people are big on these lists I have a lot of friends have you made your list yeah the list of things that you insist on having in the context of fitness relationship job etc etc this seems more and more common yeah totally and the idea like write it down right they're telling you write it down like or or create a visual manifestation of it and so yeah that that's effective for identifying what you want but it may not actually be effective for helping you to meet the goal to get the job done so colleagues of mine at New York University have probed well why why is that why is just you know thinking about what you want in your life and sort of putting yourself vicariously into those shoes imagining what my life will be like if I can accomplish everything on this list why doesn't that well first of all does it work the answer is no and why does it not work because what happens these colleagues Gabrielle Oten Jen and her and her research team have found is that you know going through and dreaming about or or or visualizing how great my life will be when I get x y and z done that is that is like a goal satisfied I have identified what it is that I want I have experienced it even if just in an imaginary way I've had that positive experience of thinking about what how great my life is going to be when I get this thing done and this starts to sort of rest on their laurels she's actually measured systolic blood pressure and heart rate and they found that people who do that who go through that experience of visualizing how great my life will be when I get x y and z done their their systolic blood pressure bottom number on your blood pressure reading decreases ok now I'm all about finding ways to relax especially in New York right you're constantly living at a high level of stimulation and so like cool great so maybe I should just like think about how awesome my life will be when I get my bucket my bucket list done but motivation scientists know that systolic blood pressure is actually an indicator of our bodies readiness to get up and act to do something now that can be the going out for a walk going out for a run hitting the gym it can also be things like doing math problems right even if it's it's something that's just mental systolic blood pressure actually goes up in anticipation of your body or your mind needing to do something taking the first steps on a goal so then it is it helps us to understand of like okay if I've just created this dream board this vision board and put myself psychologically in that space of a goal satisfied why is it bad that blood pressure goes down because it means your body is chilling out it's like all right cool I just accomplished something pretty major I actually now don't have the physiological resources at the ready to take the first step right now to do something about that so so that was a pretty monumental finding for motivation scientists to understand that like creating these dream boards these vision boards are to do this might actually backfire because it in it in it of itself is the creation of a goal am the satisfaction of the goal and then people understandably give themselves some time to just enjoy that positive experience so much for the secret yeah exactly exactly I guess now the secret folks will come after me for sure I tried to never say the name I mean I I imagine that certain strategies might work for other people but I everything you're saying again is consistent what we know about the physiology of dopamine circuits for motivation I have a good friend who perhaps incidentally perhaps not is a cardiologist at a major university said that one of the major errors that people make with book writing and completion as they will tell people they're going to write a book and people will say oh you definitely should write a book everyone's going to love your book and they never end up writing it and his theory is that they get so much dopamine reward from that immediate feedback with all the protection of never having the book criticized that they never write the book I'm sure there are exceptions to this but I guess it raises the question what's the better strategy yeah so I'm not saying the people who enjoy dream board creation should stop what they're doing that's not the take home message here board oh definitely not that no there's enough anxiety and fear in the world we don't need to encourage more of it but the process of goal setting shouldn't stop with articulating what the goal is so at that same point that we're trying to figure out what we want to do what what is my vision for the future in those planning sessions we need to simultaneously think about a couple other things one is how are we going to get there so take it out of the abstract take it out of this idyllic visual iconography and start thinking about the practical day to day we need to break it down into more manageable goals not just my 10 year plan for myself but my two week plan what what can I accomplish in the next two weeks and the two weeks after that's going to set me on the right trajectory that's probably not surprising to anybody who's been thinking about how do I set goals better plan plan big picture think big picture abstractly but then also break it down more concretely that's probably not surprising but it's an important aspect of the goal setting process then again Gabrielle Odinjana my department has identified a third often overlooked or under appreciated stage that has to happen at that goal in the goal setting process and that's thinking about the obstacles that stand in your way of success and that will actually help improve motivation in the long run and sometimes people think that that like is counter intuitive you're saying like for if I want to increase my motivation have more motivation than I need to think about how hard it's going to be all the ways that I'm going to fail how is that going to like jazz me up how is that going to help me get through when I actually you know when when when things get hard but it does because it's like coming up with a plan B a plan C plan D in advance of actually experiencing that if you were on a boat and the boat started to sing that's not the time you want to start looking for life jackets you want to know where one is so you can go to it right away and the same thing with goal setting is that you want to know what am I working towards how I'm going to get there and if I experience this obstacle here's what I'm going to do about it you may never experience that obstacle but if you do you're probably going to be shy on time in on resources maybe experiencing anxiety that hijacks your brain so you're not functioning at that optimal level of judgment decision making you want to already have like the snap next step in place so you can just hop to it right we're not going to do our best thinking when we're in crisis mode but we don't have to if we have used if we have already used our resources in advance to come up with that plan B or that plan C Michael Phelps like incredible athlete right this is a mean that he and his coach have routinely incorporated into their into their training so I love this story that like back in 2008 he was you know hot hot for the first time on the international stage was the Beijing Olympics Michael Phelps was on the brink of doing something that no one else in the history of the Olympic games has ever done which is when eight gold medals in a single Olympiad at the time of this story he had already won seven and he had just the 200 fly in front of him before he could do what no one else has ever done when the eighth gold medal and like the fly is his thing right this should have been and this should have been easy like a no brainer he's going to win this he's going to break Olympic history as soon as he dove into the pool his goggles started to leak and by the time he had done three lengths of the pool he just had to flip around and and come back to the to the starting line slash finish line back to the edge by the time that happened his goggles were completely filled with water and he was swimming blind I would panic that would have sunk to the bottom of the pool I wouldn't have been in the pool to be honest like I'm not a swimmer it definitely not going to be in the Olympics but but for him he didn't it wasn't a moment of panic like it probably would have been for nearly every other person in that situation because he had for shadowed that kind of possible failure he had imagined that obstacle hitting him in advance and not even just imagined it but practiced it what will we do he routinely practiced swimming with his goggles not fully secured on his face coach notoriously would rip the goggles off of his head smash them on the ground for maybe dramatic effect or something so that he didn't even have any goggles possible to grab as he's as he's in practice. So because he had for shadowed that possibility and the solution if my goggles start to leak then I will do in his case start counting my strokes then I'll make it through he knew exactly how many strokes it would take from him to get from one end of the pool to the other he started counting a strokes he won that he won that race the 200 fly one is a gold medal and he'd go on to win 15 more in his career. So we might not all be swimmers we might not all aspire to Olympic level performance but I love that example because I think it helps sort of demystify or give us an alternative perspective on the importance and the motivational reasons why thinking about obstacles in advance thinking about the ways the two three four ways that your plan might go awry is actually effective at helping us to overcome the obstacle that might otherwise lead us to throw in the towel. That's a beautiful example I'm going to springboard off that example to ask a question that has also been on my mind which is is there really anything special about vision because in the example you just gave it was indeed vision that Michael Phelps was deprived of and it was counting strokes. Counting is another form of incremental measurement in the nervous system obviously there are others it could be the sensation of the hands smacking the water breaking the surface of the water so there any number of different variables or metrics that one could use. I could imagine that setting out on a let's say a three mile run which for me is a decent distance run it's when I do a few times a week I'm also not a runner but I try and complete some runs a few times a week at very slow pace just for my health. I could count every step that would be kind of exhausting but if I knew that three miles was well I'm going to estimate here I don't know a couple thousand steps. I could count backward I could count forward I count every 10. I confess I spend every morning trying to find sunlight to get sun amized to set my circadian rhythm and I do 100 jumping jacks so I'm the guy that people are looking at strange on the street but sometimes I count every 10 sometimes I count backwards I count forward is there any indication that it matters or is it simply that we attach some sort of meaning to that increment and the mode. I think that's the kind of way of reaching that increment because it does seem like there's something special about vision we can maybe dive into a little bit more why that is but at a very basic level. How broadly or finally should one set the increments and does it matter if you're counting steps or counting strokes if you're maybe it's every other song you're going to listen to an entire album. Something that I don't know if people do anymore or you can listen to a whole playlist and then listen to it again and you're going to run as long as the playlist is completed twice. You can obviously see what I'm getting at but I know people are going to want to implement these tools and I have to guess that the nervous system is is somewhat indiscriminate when it comes to these things but that there might also be some specificity. I think vision is special and I think you do too so in for a variety of reasons when you start you can really nerd out on how cool the brain is and how cool vision is within the brain and when you do then you start to find some things that make vision unique right more more real estate more neurological cortex real estate is taken up by the visual sense than any other sense more than taste touch smell right vision gets more real estate gets more neurological processing space than any other. Why is that well because evolution has led us to prioritize that visual the visual experience. There's some cool illusions where like maybe somebody's mouth is doing something different than what you're hearing when people sort of create these like you know weird tricks that might go on YouTube and go viral. And people are trying to figure out what did I hear what did I see his mouth doing and what comes up is that people people prioritize what they see over what they're hearing when the two are incompatible or kind of like out of sync every time. Yeah every time right if you have to bet on it bet on bet on what it is that you're looking at rather than what you're seeing. Why is that well I guess a couple other things to right like we can see super far you can see like a flickering candle on our horizon if it was a totally you know clear sky several miles away you can see the international space station floating up in the in the night sky right like hundreds of miles away our eyes are amazing. And we prioritize what we see that and I think that's because we never we rarely get the experience of having our visual experience second guest. You know oftentimes we're having conversation maybe in a loud restaurant and we know that we didn't hear the person right and so we say like oh did you say that or like I thought you said this and they're like no I didn't say that right so people will correct us when our ears get it wrong. Or we're tasting something amazing and we can't quite figure out what spices were in here and so we know that our tongue isn't quite picking up the the taste the right way and that's why we read the menu to see what are the ingredients are we asked the chef like what did you put in this it's amazing. So we know that our tongue is getting it wrong or you might be touching something and you look at the tag to see what sort of textile was used in this really amazing piece of clothing that you're looking to buy so we know that our sense of touch isn't quite getting it right. But rarely do we have that experience of having our eyes get updated where we're looking at something I think I'm looking at my mom. Oh no actually it was actually my husband like okay like that never happens right that we have gotten vision as wrong as we might get any other thing that that we're experiencing through any other sense. We trust our visual experience we have a sort of a naive realism that what we see reflects the world the way it actually is because it's never really fully tested. We never get the input or the feedback that you've seen something wrong until a visual illusion pops up on social media right like the dress example or the last week or so there's been that horse seal line drawing that's been all over social media to what do you see I see a horse someone says I see a seal and then like you know chaos erupts or I thought the dress was blue and I thought it was. I don't remember the options because I see it is blue so right and it's like dividing up families and friendships because you've like seen something that the other person just literally cannot see and that's why we love those examples when they pop up in social media when they do is because it defies all of our previous expectations. There's a really amazing if this interests you there's a really amazing visual artist and each Kapoor who plays with these ideas too and his installations are are just fascinating I saw one at a museum once where you know walk down this long call and it's just a big black rectangle that's painted on the wall. I was like this guy is super famous what the hell it's just a big black rectangle painted on the wall what is this about like what a hoax you know this museum paid how much whatever but then as you get closer you get closer and your eyes start to settle in and they adapt to the different visual lighting realize it's not a black square painted on the wall it's a huge hole he's carved into the wall and there's a whole other world that that's back behind there that you can't see right away until your eyes adapt to the different lighting conditions. It's amazing vision scientists I have to see where is this exhibit it's not up right now I've seen there was a retrospective several years ago that was done in Sydney but his work is all over the place so a niche Kapoor definitely definitely worth looking up because because it like the dress example or the horse seal line drawing or artists like an eesh Kapoor's work that is a moment that that gives us a different unexpected insight about the world that it challenges us to see something that we hadn't seen before or it induces or tricks us and to seeing something that we wouldn't have otherwise have seen and so it's those rare moments that I think are actually really important for understanding what do our eyes normally do because we wouldn't find these examples so surprising so engaging so shocking if we had routinely gotten the experience of realizing we're not seeing the world that it is so that is why I think vision is special and why it can be thought of as a tool that we can add to our toolkit for how to better accomplish our goals I'm not saying that we should just only focus on imagining the world through an attention spotlight but maybe that's something that we can employ strategically on occasion when we think it's going to best help us when we need an extra little push to cross that physical the literal or metaphorical finish line but it doesn't have to be the only tactic that we use just like it's not bad to use vision boards but let's use something else also it's not it's not bad to talk to ourselves in encouraging ways but let's try adding another tool to our tool belt in case that's not enough to get the job done so I do think that there's great power in thinking about our visual experience alongside other tactics that we might use for the meeting our goals and another one of those tactics might be like the numerics that you're talking about how do I think about my jumping jacks in terms of groups of 10 or as a set of 100 you do it routinely so you might be able to set a goal of 100 and have that sustain you through number 16 number 70 when maybe it's starting to get harder but for somebody who's just starting out and wants to be able to make it to 100 that's probably not going to work that's going to be maybe really that could be quite challenging for them if it's the first 10 that they're trying it and so instead setting those micro goals of groups of 10 is going to be useful because as we start to get to number eight or nine or number 88 or 89 and it's really getting hard we need that extra little hit of pleasure of accomplishment the micro dopamine rush that you might get by hitting another 10 you know another decade milestone another group of 10 milestone I want to be get that little hit of pleasure excitement or self congratulations that might be enough to sustain us through the next challenging physical obstacle the next group of 10 that we might experience so there isn't any like prescription that I would give and say every person should decide that 25 jumping jacks is the goal. No, we have to be idiosyncratic and in introspect about where are we at with this goal this thing that I'm trying to accomplish and set those goals realistically but inspirationally as well we want to set a goal that will challenge us but isn't impossible. We don't want to set goals that are too easy because we're not going to trick ourselves into like feeling so great about doing born jumping jack. Great, like pretty sure most people if that's a goal they can do one so are you going to feel so great when you hit that goal no because it was too easy you didn't have any doubt that you could do that one but what about 25. Okay, yeah, I might feel pretty good about that. What about the next group of 25 and now I'm at 50 those are goals that might seem just beyond the brink of what's possible but I will feel good when I hit that and that's going to give me the next sort of boost of energy that I'm going to need to go a little bit further either that's going to be a little bit better. Either that time or the next time. Yeah, I think vision is special again I'm strongly biased here might you know the reason I initially learned about your work. Was well now you have this amazing book but the time there wasn't the book there were just the scientific papers and of course upon which the book rests and those papers are really important but was the relationship between vision and our obviously is our sense of space but how the sense of space and time is going to be a little bit better. So the sense of space and time are related and to make the idea quite simple for those listening you know when you narrow your visual window you're measuring the time been also gets smaller right which makes sense when you hear it whereas if you take on a huge visual landscape. So you're going to be carving up time differently it's sort of like moving from a slow frame rate to a fine frame rate you know slow motion camera is actually taking a lot more snapshots right so you're measuring distance over time more finally and so where strobe would be the other example which is strobe is very low frequency so you're doing here here here as opposed to you know slow motion right strobe gives a course. So you're going to be able to do it into the time domain and high speed photography gives a fine view in the time domain so I'm almost certain without any knowledge of underlying data. I'm but knowledge of the mechanism them I am almost certain if not certain that by placing a narrow visual aperture we change the way we perceive time. I have a question and I to be honest I know the answer in advance but I'd love for you to tell us a bit about how some of this works still further in reverse meaning how unfit people view the world versus how fit people view the world or how unmotivated people visually see the world as opposed to highly motivated people. We talked about the easily runners give them Michael Phelps example but maybe you could describe that study I think it's a particularly important one mostly because yes it identifies a perhaps a physiological or psychological differences between motivated and unmotivated or fit and unfit people but it also provides a path to remedy that. So you know there's out of my lab but also out of several other labs there's been work looking looking at that relation between states of the body and visual experiences. They haven't necessarily tried to to integrate the motivation science element to it but they were looking to see the visual experiences change as a function of different states of our body so they've looked at people who experience chronic fatigue. The elderly people who are overweight those that are wearing wearing heavy backpacks and so who are sort of put into that experience of being overweight what happens to their perceptions of the environment well what they find is that distances look further to those that are overweight chronically tired older rather than younger weighted down with extra baggage distances look farther and hills look steeper. We've we've done some of those studies to where we try to like give people more energy or or deprive them of of energy and see does that change their perception of space and we did that by you know sort of a classic technique of a double blind study where the participant doesn't really know what they're experiencing I thought you can say double espresso. That is also a good psychological experience to give people. Yeah so you know a double blind experiment where the participant doesn't really know the full extent of what what they're doing or their experiencing and the researcher who's interacting with them also doesn't you know they do this a lot in medical studies. You give somebody a drug and you give somebody a placebo a sugar pill and then importantly nobody really knows who's got what until you've analyzed all the data and the results are revealed that that these are the people that that had the drug the active agent same idea and the psychological research in this case what we did is give people cool aid to drink and for some people that cool aid was sweetened with sugar and actual caloric entity it could give them energy other people drink cool aid sweetened with splenda. So yeah it's sweet but it actually doesn't have any caloric value you're not giving people energy you're just giving them that that experience of sweetness now some people of course are really good at identifying like what's what's real sugar and what's blend but when you put it in a cool aid a pretty noxious powder it actually masked it for everybody and nobody had any ideas because it is like garbage. It's like garbage. I mean I'm sure there are many people that love cool. I guess the sales of cool aid will reveal the data. Yeah I grew up in Nebraska actually where cool aid is from it originated in Nebraska. So I do feel like I'm betraying my roots lately by by casting some shade on cool aid but but that's how it worked is that you know we asked them to guess what they got we tested them afterwards and they were wrong so nobody is able to guess with accuracy what was your drink sweetened with which is important because they were blind that way the way that scientists use it they didn't know what it was that they were drinking we give it you know we give them about 10 to 15 minutes for that sugar to metabolize and we measured their circulating blood glucose levels to make sure that we had in fact to give in their body circuit you know circulating glucose energy that they might use in the next activity. And and the researcher again didn't know whether they had just served sugar or slenda then we asked people to estimate distance so we gave some people more energy or we kept other sort of like whatever their normal level was. And what we found is that those people who didn't even know it but who had been given more energy by drinking cool aid sweetened with sugar perceived their space as as more constricted they that visual illusion of proximity was induced they felt that their finish line again in the context of an exercise task was closer to them. So in just the same way that these other physiology labs vision science physiology labs found that people who are chronically tired who don't have don't feel like they have as much energy or those that are physically weighted down and for whom you know moving within an environment is more costly. We could create that experience for people we didn't experimental version of that that if you have more energy the world looks easier the distances to a finish line don't look as far. So that was the experimental evidence that we had to show that people states their body do impact the visual experience now I'm a motivation researcher so for me the big question is well what's the point of that study then besides just showing this connection between the body and the eyes and the visual experience we think that that's fundamental to one of the reasons that people experience difficulty when they're exercising when it's really harder for your body because of its physical state to move within a space. Why don't you might say like well why don't they just go exercise because the world looks harder to them because that distance that that they're supposed to walk because a doctor tells them to or that a partner encourages them to or a hill that they should hike up because someone told them that would be good for their health it looks more challenging to them. Then it does to somebody who isn't who isn't who isn't who's in better physical health now if it looks that way if it looks harder if it feels like it might be harder then psychologically we know that it is when you have set yourself up psychologically mentally for that kind of failure experience like I don't know that I have the resources that to get this job done this looks really hard. You're already motivationally in a place for this task to be closer to impossible for you so to put it all together then what we know is that people whose bodies might make it more challenging for them to exercise are seeing the world in a more challenging way and that is having these downstream motivational and psychological effects that makes it less likely for them to try to take on the task in the first place or to experience it as harder than other people would or do. Is the solution the same however meaning if these people are taught to adjust their visual goal line or to set a visual spotlight on an intermediate goal can they overcome some of this challenge that they face simply by virtue of their skewed perception yes so in all of the studies that we have done looking at that connection between this narrowed focus of attention and improvements in exercise we do not find that it only works for the people who are in shape. Or that a backfires for people who are out of shape it works for everybody this is a strategy that everybody can adopt because it's just simply about like what do you allocate attention resources to what do you sort of ignore and what do you focus on and that in that visually induces the same kind of illusion for everybody regardless of whether you're overweight or you're or you're at your target weight. Or if you're struggling to get there you've already accomplished where you want to be that visual illusion can be induced for everybody and it has the same kinds of consequences terrific earlier I made a joke about double espresso but now I'll make a serious statement about double espresso which is that it contains caffeine and caffeine as a stimulant like all other stimulants. And that stimulants cause a change in our visual world the most salient one is the one that police officers look for parents suspecting that their kids have ingested substances of any kind look for which is if somebody's pupils are unusually large for a given visual environment that is an indication of high levels of autonomic arousal in the street drug translation of this you know people who take amphetamine or cocaine. People are very relaxed as small pupils however everyone should know that pupil size also is dynamically regulated by how bright the visual environment so there are multiple things controlling pupil size. However we know that when we are very stressed or very aroused in any way positive or negative the people get big but within the visual system what that equates to is a narrowing of the visual aperture. So rather than ingesting sugar which I'm guessing most of the world certainly the US needs to ingest less sugar at least that's what we're hearing I'm sure there are a few sugar you know sucranistas out there sucrose and these does who will also come after me with pitch for its but let's face it most people probably better off ingesting less simple sugar. But caffeine is a great motivator because of the internal sense of a ralas but it also narrows our visual window I could imagine using healthy amounts of caffeine combined with maybe even blinders of the sort that horses were maybe like a hoodie and hat maybe blinders in order to get over some of those more challenging milestones is there any evidence that people are doing this without well obviously people are doing it without knowledge of how it works but are there any studies looking at how adrenaline. Or up and effort and any other stimulants impact motivation. I don't know honestly yeah I mean energy drinks are a big thing now yeah yeah for sure they are and you know if if you actually are more physiologically aroused or jazzed or whatever you know amped up or you just think you are in our studies we have found that they work in the same way that it can produce the same kinds of consequences so and I like that because it tells us like you can actually change the state of the world. You can actually change the state of your body to induce these kinds of experiences or you can try to you can just think that you can trick yourself you can placebo affect yourself out and produce the same kinds of effects. I had to give up coffee like 12 years ago not because not for any sorry I love the taste and so decaf is my jam but I can't drink the caffeine because it didn't actually do the thing that it does for so many other people like make me feel more energize and more awake I just got sweaty and jittery and anxious and I couldn't focus. I think people who already have a fairly high baseline level of attention and motivation they find that puts the autonomic seesaw too far in the sympathetic tone. Yeah and it happened to marry the same kind of person he also can't drink caffeine but loves to taste a coffee. The interesting thing is that we both have to have coffee in the morning to feel like we're ready to go for the day. So it's just part of our routine or whatever to have that taste and have that sensation to feel like I'm ready to take on the day even though I mean yeah decaf still has some caffeine in it but we're not drinking that much of it to probably actually create a caffeinated experience in our body but we're tricking ourselves psychologically into into doing that thing that in years past used to work for us both. So I think that's something to keep in mind like you know you might have a hoodie that you can wear to induce that visual illusion or you can take advantage of the power of your mind at the end of the day I'm a psychologist and I believe that we have some non zero power over what our mind is doing what we're thinking about what we allocate our attention to that can do the same kind of thing that a hoodie might do or that a cup of caffeine might do. I completely agree the visual aperture is under our conscious control that's an amazing feature of our visual system we can narrow or expand it takes a little bit of practice I think for people to learn how to do this without moving their head around to expand their visual aperture and how to narrow it but what I always tell people is just imagine a really troubling text message or a really exciting text message coming in all of a sudden you forget about the world around you. So it's it can be triggered by these outside events and we can learn how to anchor our visual attention. I'd love to ask about other kinds of goals meaning non physical goals because many people are trying to read more I would hope or learn music or a language or things that really involve cognitive goal lines or internal goal lines you know reading one chapter out of a book each night is a tangible goal. The other that I've often wondered about are these systems that allow you to highlight individual lines or even words on a page that's a very visual obviously and everything else is rolled out except that word I've always wished for books that would naturally highlight each page as I say that someone put in the comments is probably existed for 10 years and I'm just showing how what I look I am but is there any example that were or tactic that people could use to better approach cognitive goals of school work recreational to but that don't exist in the in the kind of fitness and sports domain. So just to shout out to my brother in law who has done some of that research where it does highlight different parts of words in paragraphs and he sounded to be an effective way for English as a second language learners to pick it up that that is that tying that vision to the process of learning language is effective and so there's you know whole cool body of work and researchers looking at that so you're right about that. I want to mention what he does is there a place that people can learn more about that we can provide links. Yeah, let me. Okay, we will provide links to those resources because I want those resources. I've been trying to learn a second language for a long time. Yeah, I speak Spanish pretty weekly but I would love to get better at it. Okay, I'll approach you later. My five year old son speaks Spanish better than I do at this point. And clearly, thank you. Yeah, so you know, I was thinking that too, you know, we started this work within the context of exercise but of course that's not people's only goal that they have in life. And it isn't mine either, you know, I have interest outside of improving my exercise game. A couple years ago when when I was writing the book, I also had a child the same the same month that I had the opportunity to like pull all this research together is the same month that that my son came to be. And and I started to realize like I became a lot less interesting once he was around he was fascinating, but I was changing diapers and feeding him and like that was it people come over like what's up. Have you been like tell me something that's going on in your life and like all I had to talk about was this what was boring and I just felt like I've lost myself I used to pride myself on like crazy adventures and problems I would get myself in and I was a great storyteller. And that all of a sudden disappeared as soon as he came into the world because he became my world. So then I started to think like I need to pull back some coolness and if I ever had it in the first place, but I need to be a cooler person that I'm coming across right now. So I decided I want to learn to play drums. I'm and I want to be like a one hit wonder as a rock star drummer. I only want one song because I know I'm not going to be able to do more than that. I'm not coordinated at all, you know, like from the beginning of time in fifth grade, I have this really vivid like flash bulb memory of playing basketball for the very first time I lost my footing I knocked into my own teammate push her out of bounds where she had the ball we lost the game and I was not invited back on the team for the next season. So that, you know, formatted my self definition of uncoordinated I am a musician, but I am not a drummer and the idea of coordinating four limbs in real time was like if I could do that, I'd be so proud. So that's a goal that I set for myself at the same time that my son came into this world when I was also trying to think about goal setting and how to improve my ability and all of our ability to get a job done when you're faced with some pretty big obstacles. So I got to practice all these techniques that we're talking about on myself and see for myself when I tell people, hey, try this thing like narrowed focus of attention does that help with something like becoming a better drummer. And the answer is, yeah, these tactics at least work for me sometimes under some circumstances and they do for other people who try them for other goals that aren't necessarily about exercise. You know, one that I found particularly helpful was overcoming my bad memory that everybody's memories are faulty right everybody has sort of a warped perception of the past might be skewed more positively than maybe we deserve or might be skewed more negatively. If you feel that you know what looms large in your mind as you reflect on something from the past are the mistakes that you've made of the things that the social full pause that you had or you know challenges that you faced at work when you got in trouble with a boss or the colleague that's what really stands out in your mind. Or the good side of all of those possibilities we probably aren't getting the world right and and that is something that our brain has evolved to give us a faulty memory to level and sharpen to not encode and remember and be able to recall everything that we've experienced with accuracy and precision. And that's a problem when it comes to assessing our own goal progress when we want to be our own accountant and try to determine how are we doing if I want to become a drummer am I on track for getting there before X before my time runs out. Am I going to make it or not and I think that's an experience whether they want to be a drummer or not that a lot of people can resonate with like trying to determine is this trajectory is this rate of progress going to get the job done by X amount of time well I have my swim suit. Body by summer or well I save enough for retirement by the time I hit 65 for these goals where time is involved and there is a deadline we do take moments to assess our our trajectory and if we just rely on our memory. We're probably going to do a bad job of assessing that the that trajectory of knowing whether we're on pace to meeting our deadline and I found that to be the cases I was thinking about am I actually going to be able to learn this song. I mean I know that it's going a lot slower than it probably would for anybody else. But to give myself a deadline and a commitment I decided I was going to put on a show I was going to invite everybody I knew and also people I didn't know and I was going to play my one song for them. This is while writing a book and having just had a child. Yeah so when you read the book you'll see my story and it's the real truth of it you know I mean I did play that show and it was fine. And then I've because I wrote about it in the book then some other opportunities to play it publicly have come up and it's like. I told people I can play drums like better to like show them that I actually still can play this song. Yeah so that that's been fun I have become a one hit wonder if you asked me to play the song again like like encore it's just going to get that same song a second time so like literally one hit wonder. But so in the process of like figuring out I might be able to play this show I sent out invitations like the date is committed like people are coming to listen to my one song God bless them. How's it going to go and and it felt awful it just felt like I am not making progress here because there's a lot more things that actually are pressing right like the kid does need to get fed I do have to go to my day job the editor is asking for the next draft of this book. And that is going to take precedence like it does for so many people that that things command your your bandwidth even when you have this goal that you've committed to and that you've got you know on the books. And so I just felt this looming anxiety about this this goal that would require you know like didn't have to be daily practice but like you can't you can't cram that kind of a goal it does take. You know committed investment for sustained period of time and so I had this looming anxiety that I'm not making good enough progress. But that's because I was relying on my memory and my brain to recall like how many times did you practice what was it like the last time you practice what was it like when you tried to play this bit. You know this riff like two weeks ago have you gotten any better since then and it just felt like no haven't practiced enough I don't remember when the last time I played was but it definitely doesn't feel like I'm getting any better. And I thought you know what I should stop relying on my brain to tell me where am I at and is is am I on an upward slope here I need to look at the data I love data scientists love data so I started to collect data on myself. What I did was download this app that a friend had told me about called the reporter app there's lots of these kinds of things out there basically it just like sets up your phone to randomly ping you with whatever questions you want your phone to ask. It records your answers you can download the data you can make pretty graphs to see am I getting how what's my change and how I've answered these questions over time. So I did that for a month for a month I had my phone ask me you know a couple times a day maybe twice a day really did you practice since last time I asked you my phone says did you practice if mostly it was no and if yes then it would funnel a couple other questions like how did you do how do you feel. I will check a couple different emotion words now about your experience when you played. So when I and I did that for a month after month went into my office downloaded the data and first took stock before I looked at the numbers like how do I think I did over the last month and I thought same as every other month. I like I didn't really get anywhere yeah I practice but I still feel awful and I cried I cried having to practice I like was upset with myself for setting this goal and feeling like so anxious about all I remember is that I cried. I cried too much about this personal conquest that wouldn't matter to anybody else honestly really doesn't matter in the scope of things anyway I'm not going to become a drummer professionally so who cares if I embarrass myself publicly. But what I found from the data was my memory was totally wrong actually had practiced far more times than I remembered and when I looked at like my emotion words that I used it was a clear upward trajectory yeah I did cry that part I hadn't remember to made up. But by the end of that month like I had gotten a compliment from my husband who actually is a drummer and said like hey that wasn't that bad and then there was like one explitative you were a thing amazing at that one thing you've been practicing at. But like okay fine is my husband right is he just you know so at the moment it didn't really feel that great and I downplayed it and as a result it didn't stick in my brain right I remember how stupid it felt that I cried because can't do this. I can't make progress and I downplayed in my mind the thing that actually should have been a legitimate indicator that progress is being made. So all of which is to say I needed to see to collect that data on myself and to look at it objectively accurately and completely because my brain wasn't doing that for me that visual experience of of downloading that data and and looking at like what was my actual experience. Give me a better insight as I was trying to assess the trajectory of my of my progress I became a more accurate accountant of my own progress which is important for you know setting goals or resetting them when you need to calibrate in light of what's left to do and how much time do you have to do it in. So basically if I understand correctly when the when the intermediate goals of say daily practice or twice a day practice or reading or math etc are not a visual goal line it really does help to visualize some aspect related to that non visual goal line in this case the reporter app was a useful tool. I've never heard of it I plan to use it. I'm sure a number of people will be interested in it sounds like there are others out there but that's the one that you found most useful. Yeah yeah there's another one too that is even more visual than that to the reporter app although that has visual components and is really effective if you like data and want to collect numbers on yourself for your experience there's another one called the one second every day app. This is really awesome because the app is a mechanism to to record one second of your life the goal such an awesome community of people that just live by this and love having these experiences and the creator of it I got a chance to talk with and he has done this he's taken a one second video of some aspect of his life every day for 12 years 13 years or second yeah one second. And and then what the app does is like smash them together and give you like a chronology of what your year or your month or your last decade of life has been like and presents it as like a streamlined video for you so you just see these flashes of your life over however long you tell the app to create a create a montage for you. And so when you see these videos that people have made especially those that have been doing it for a really long time it's fascinating I did that for myself to I tried it one second of today's drumming performance another second it's not enough to capture it am I actually doing a good job of drumming or what's my trajectory for drumming. But the guy who made it says one of the most like awesome one second videos that he ever made is of a brick wall it's like we didn't need a video of that like what's the wall doing it doesn't it's not crumbling it's not like an earthquake land or something like that it's just like you know slightly jittery one second of a brick wall and I was like how is that motivating or exciting to you why is that you've been doing this for 13 years every day one second why is that the one second that matters to you most and he says because when it comes up in my montage. It reminds me of like a really horrific moment in my family that was the first wall that I saw when I walked out of the room having heard that my sister in law had this awful awful experience her intestines started to twist up on themselves and not up and she was on the brink of death and we had just found this out she had just gotten into the hospital they diagnosis issue that required like immediate surgery and our family was already here about this and we're all stunned that she might die right now. She might die and that's the first thing that I saw and it reminds me of how precious life is how important family is and how the rest of whatever we were doing that day didn't matter because we all needed to be here together right now and that is like all of this emotion and like purpose in life is conjured up or reminded when he looks at one second of a brick wall as it pops into his video feed. So if you're visually oriented and you do want ways to like remember what was life like what has my year in review what is it what does it look like that's an awesome app one second every day that that can help you do that. These are great recommendations and a couple of reflections first of all the brick wall example is a beautiful way of highlighting this other feature the visual system which is that the brain largely thinks and symbols it's very efficient it batches entire experiences into the world. And this case the brick wall can be attached to a whole set of experiences that are very meaningful to this individual that brick walls don't mean that or didn't mean that to me until hearing this so I think that the it highlights the fact that the the actual symbol is less relevant than what we attached to that symbol but that symbols are so efficient that even in a one second view of something we can attach to it for better or for worse. And I'm a absolute almost rabbit proponent of people getting morning sunlight in their eyes as the fundamental layer of setting their circadian rhythms and sleep and health as a zero cost practice that believe you're not can be done any time of year anywhere. And but it does take a little bit of effort you have to get outside you can't do it through a window or windshield to for it to be efficient but it has huge outsize effects on human health this is now been demonstrated again and again and again and so I'm going to just do a sort of call to action if people are not doing this I'm going to start using the one second after record my morning sunlight viewing improve that even through cloud cover you're getting more photons than you are indoors and then it's worthwhile I also would love to do this for my next dog to go from puppy to. To full size dog and maybe even to the end knows. Great these are wonderful tools you've given us a huge number of practical tools which frankly isn't always the case on these podcasts we always strive to do science and science based tools is our kind of mantra but you given a rich set of tools here to apply. I just want to briefly backtrack to something and then a final question earlier we were talking about how unfit people see the world is more challenging maybe even hills is steeper distances further and how shifting people into a state of energy either cognitively or through the ingestion of real glucose to get an energetic lift or maybe through caffeine if that's within their practice and span of healthy behaviors they could do that. You know there's so many people are suffering from depression which it one of the you know key features of depression is a lack of energy even though there can be anxiety associated with depression. I have to wonder whether or not some of these tools are being deployed or will be deployed in the context of mental health because depression is this vicious loop right people feel. A lack of energy and hopelessness and then things just look harder and so that it just verifies their negative world view it's a downward spiral that's why medication in some cases. And social support etc can be helpful because they feel more energized the side effects off and our problem however have there have been any efforts to implement some of these visual tools to create this increase in systolic blood pressure and a kind of readiness and willingness to lean into what people perceive as immense challenge. And if not for anyone listening I know we have a lot of listeners in the mental health space and in the helping space so to speak. I can imagine these are zero cost right they we all provide with people are cited have the apparatus to do it are you aware of any studies like this or is your laboratory involved in any studies because I just see an immense value of implementing the sorts of tools that you've developed. Yeah you know we haven't explored that those ideas directly so call to all the scientists that are out there this is there's a great opportunity to start looking at these tools within the mental health space you're right. Other researchers though have you know not this use of narrowed like inducing a narrowed attentional focus and can they now feel more energized to go for a run. But they have looked at the relationship between anxiety depression and visual experience and found you know over decades evidence that people with depression or with anxiety what their attention is captured by within the bigger global surrounding world are those things that are negative or reinforcing of their world view. Now that happens for everybody that things that are on our mind tend to like pop out that if whatever we're thinking about we might start seeing some version of it showing up in the world around us that captures our attention. That's an idea called priming what we're thinking about might then lead us to to attend to the world to see things in a way that aligns with what we're already thinking about it's just that when what we're thinking about are those depressive, negative, negative, anxiety, fearful thoughts when that is what is cognitively accessible when that's what's going through our mind then that's also what captures our visual gaze so when we think the world is hard the world is full of sadness and that's the thought in our mind and then we start seeing the people with frowns on their faces or who are experiencing anxiety and and that's what captures our attention even when there's other people around that might not be seeing the world or experiencing the world that way. It becomes reinforcing when I think that the world is threatening and then I notice the threats that are around me confirms what I'm thinking which heightens my anxiety or my fear and then it further leads me to narrowly focus on those elements of the environment that are aligned with that world view it's really hard to get out of that like that's where the vicious cycle can come from. So that has been really well established within the medical community this selective attention relating to states of mental unwellness that's been pretty well established and and so there's been some interventions done with people that have depression or anxiety trying you know saying like you know here's an array of photograph of a bunch of different faces yes it's artificial kind of looks like a page from a year book a high school year book. But look for the faces that are smiling look at the faces that are smiling like try right now spend 10 minutes having your eyes focus on those and look at those people that it is an effective intervention and try at at improving people sense of self efficacy of what can I accomplish next they feel a little bit more energized it doesn't cure depression it doesn't cure anxiety and these are literal physical afflictions that we have so that's not a quick fix but it can produce a good. But it can produce a temporary change that might be a way to start getting out of that right. Yeah and I think nowadays there's an increasing attention on tools that will help people orient as they are start to veer towards suicidal depression or veer back into a depressive episode or anxiety episode I mean you know that trying to reverse an entire syndrome or set of syndromes is far more complicated likewise in the health space just trying to get people to deploy real time tools to adjust their anxiety or to exercise more often. And so on as a kind of a final but also kind of high level question I I'm imagining that and I plan to use this visual goal setting of spotlighting I've been using it actually for some time on runs it works really well yesterday I took a run near the water front here and the entire I think I did it somewhat incorrectly the entire run I was thinking about getting back to the statue which I started but I did find that I ran fastest in the final 20 meters which admittedly wasn't fast at all. But it was faster than what preceded it. So it works and it makes perfect sense as to how it works. You've done other studies exploring some of the other features of vision like the luminosity how bright something is and how people perceive it that wasn't a completely different context but is there a kind of a higher level kind of a black belt version of what we're talking about here where not only am I focusing on a specific visual location as an intermediate or long term goal. Or I'm using an app to ask me a question and tap into how I'm feeling creating visual representation of my motivational state but that I'm also making my phone as bright as possible I'm also trying to take that visual window and actually pay attention to more of the details at that location or is it simply a matter of kind of in in geek speak visual neuroscience we would just call this like low spatial frequency just sort of grabbing a black and white snapshot of something here or there in my mind. If I attach more detail and effort to the specific thing that I'm focused on is there any evidence that's more effective. It certainly you know changes what our brains are doing so you know how do we define effectiveness that's a question for philosophers and that scientists will be running. Yeah it will when you use it towards the end of your run just like you picked up on. Yeah so you know there's there's cool studies that neuroscientists not not I not coming from my lab that neuroscientists have done looking at what is it what is it doing to your brain when you've decided that you're going to focus your attention on. On this element of the world and not pay attention to something else is that just sort of like tricking your thoughts or is it doing something different to something more basic more low level and the answer is yes so there's an area of the brain brain the fusiform face area it's part of our brain that's really specialized for. For making sense of faces important as a social species to to pay attention to other people pay attention their faces with a trying to communicate through their face so our brain has developed a really specialized central area for doing that. And so people so these neuroscientists will present like a face to somebody but super imposed over that is a house or something else that is less special to us as a social human species. And so both of those things because it's sort of like both images are sort of transparent overlaid over one another it you know our eyes are getting both of those images in and our brain is getting both of those images in but we can. And we'll ourselves to focus on the house just really pay attention to the features of the house even though everything about that face is still there to or pay attention to the face and just tell me like what is it that you are deciding that you want to hold on to that you want to look at right now. And you can see that the brain is responding to that so when people are saying like I'm really I'm really seeing that face the details of the face from paying attention to the face even though we know their eyes are also looking at. And so we're seeing that the brain is being engaged with the contents of the house that's right there snapped on top the fuser form face area lights up. And when they're saying like no I'm really focused on the house now we see activation the fuser form a face area decline and other areas of the brains neurological real estate start to engage. Yeah I think you know there's something to it that you know we can at a high level our brains are responding to our psychology as well and we have that great power to really you know with intention with practice decide how do I want to engage with the world and can it produce real change in our in our bodies in the way that we experience a world the answer is yes. And so that's fantastic well you've given us a ton of mechanistic and conceptual and practical information so I'm speaking for a lot of people and I say thank you for taking the time out of your schedule and it's kids in running a lab and teaching at the university and your book which we will point people to and provide a link to is a wonderful resource and we hope to have you back again. Thank you for joining me today for a discussion about motivation goal seeking and research supported tools for achieving your goals with Dr. Emily Balschettis. If you're learning from and are enjoying this podcast please subscribe to our YouTube channel that's a terrific zero cost way to support us in addition please subscribe to the podcast on apple and Spotify and on both apple and Spotify you can leave us up to a five star review. 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