Re:Think Decision Making 2019

Annie Duke

fs | Learning Community

Shane Parrish: Alright.

It is my pleasure to introduce you to Annie Duke, who's going to be speaking with us.

Annie has devoted her life to making decisions in the most uncertain environment, one of the most uncertain environments that I can think of, which is playing professional poker. She won millions of dollars, and I would suspect lost millions of dollars, earned a World Series Poker bracelet, and Annie and I have gotten to know each other a little bit over the past year since the podcast.

I think you'll discover that not only is she super bright and switched on, but she's an amazing person. Just listening to her for a few minutes, you're gonna … it'll come across. She is just one of the best people I know.

Annie Duke: Oh my gosh, I feel the same way about you. That was very sweet-

Thank you.

-thank you. Thank you. That was very nice.

Hi. Can everybody hear me? Because I've got the loudest voice ever. Do I need the mic?

Yes.

I do? Okay. That's a first, that's the first time that's ever happened to me.

Okay, so a couple things. I normally have a beginning slide up, which I don't have today, which is just ways to get in touch with me. So, if you go to www.annieduke.com you can get in touch with me there. There you can look at past editions of my newsletter, which normally goes out every Friday.

At the moment it's going out every other Friday, because I'm under a book deadline at the moment, so I've got other writing obligations. But, you can go see that.

I don't know if any of you have ever read or subscribed, but I really talk through the kinds of concepts that we're gonna talk about today, looking at what's headlines in news, science, business, so and so forth. I actually ... sometimes Shane appears in there. So, if you guys go you'll see past versions, you'll see the archives, and the maybe you want to sign up there.

My twitter is @annieduke. I actually reply to all my email and I really enjoy a good conversation and I learn more from the people that write into me than I think I learn from anybody else.

So, just really quickly, a little bit about me. I started off my adult life as an academic, doing cognitive science at the University of Pennsylvania. I did five years there. Right at the end, I was going out on the path I thought I was going to head down, which was to become an academic and a professor. Seemed like a good idea since what I was doing didn't have a ton of application. What I was studying specifically was leaning under conditions of uncertainty, specifically how children learn their first language. That's a super-uncertain system, but they're really good at it. So, I was interested in why that was.

As I was going out for my just job talk at NYU I had been struggling with a stomach problem, I got really sick, I landed in the hospital for two weeks, I had to cancel all my job talks, I felt like super bad luck.

I was supporting myself while I was at UPenn with a National Science Foundation fellowship. When I had to take a year off in order to recuperate, I didn't have my fellowship anymore, I needed money. That's when I started playing poker. Specifically, just like something I was going to do in the meantime. I'll start doing this in the meantime, to make some money, until I can get back out on to the job market after I'm better.

So, the meantime turned into 18 years. I played until 2012, when I retired. I have no doubt that's what the NSF had in mind when they gave me that money.

But actually, I sort of look back on … it seemed like such bad luck when I got sick, but actually that was pretty good luck. I feel I like ended up in a place that it was very, very low probability that I would have ended up had I stayed on the academic path in terms of the people that I did interact with. Like now, I'm doing research with Phil Tetlock and Cass Sunstein and David Mabelle, and I hardly doubt that I would have made it to that level had I stayed in academics. You never know until later whether it's good luck or bad luck.

At any rate, about eight years into playing poker I got asked by a group to come and speak to a retreat of options traders about risk. It was the first time that I really thought explicitly about how the things I was studying in cognitive science spoke to this really hard real-life decision making problem I was trying to tackle and pull through. And specifically I was really interested in this one problem that I felt, which was that in every introductory psychology class you learn this thing: Learning occurs when there's lots and lots of feedback, tied closely in time to decision and actions. Which is just a statement we learn from experience, and the more experience we have the quicker it comes, the better off you are.

So, I thought about this poker issue, and I said, well this is weird. Because, the average hand of poker takes about two minutes, you have up to twenty decisions in the hand that you get to experience, there's immediate feedback. I'm starting out in this game, and people who have been playing for twenty years are making the same mistakes over and over and over again, despite being really clobbered in the head by their results. And that seems weird. So, I started thinking about that problem. Why is it that this was this thing that I can learn as an academic, but I certainly wasn't experiencing this in poker. I mean, after all, if that were true, everybody who played poker would be pretty amazing at it. And yet, everybody who plays poker is actually quite bad at it, except for this really small slice, about 1% of the people who play it actually are really good at it. So, that's kind of where I went with my thought.

In 2002, I got asked to do that one talk, started getting referred out from that one talk, built a business out of it, by the time I retired in poker it was about 80% of my business, I took the scary leap of going all the way and retired from poker and that sort of resulted in this book, and the book that I have due in a couple months and the book that I already am working on a contract with for after that.

So this is what Shane and I talked about. We talked about what we wanted to do, what would be most valuable for you guys, so I imagine that some people in the room listened to the podcast that Shane and I did, I imagine some people in the room have read some part or all of the book.

What I want to do is actually give a relatively brief presentation, which is gonna be mostly bad news, where I'm just sort of reminding everybody of the problem of what's going on. Why is it that when we inject this kind of uncertainty into our feedback that it trips us up so badly? And then I'm just going to end this presentation with a thought experiment that's gonna then bring us, hopefully, to a really great conversation with Shane and you guys participating where we can really talk about ... what are these problems, how can we solve for them? Because I'm not going to give a whole lot of solutions in here. So don't think that I'm just all grey clouds and sadness. I really believe that you can do a lot to make your decision making better, just, you're not going to see it here.

That's all. What's happening on the screen here? Anybody want to tell me what this is a picture of?

Go ahead.

Audience: *Sure. So this is the Super Bowl from, whatever, three or four years ago. Seahawks are just about, or they're looking like they're just about to score. They have a choice, it's second down so they have lots of opportunity, plenty of time on the clock and a time out. They have to get a touchdown, they can't score a field goal, so they have a choice here essentially of either running or throw it. I guess, they have one of the best running backs in the game, certainly in short yardage things, and also one of the best both running and throwing quarterbacks in the game, and a kind of a mediocre set of wide receivers and they've been working effectively against the Patriots defense for-*

Right.

Audience: *-most of the game.*

Exactly. So, this is the Super Bowl, it's 2015, we know it's the Super Bowl because New England's in it.

Audience: *Go Pats!*

Go Pats! I'm from Philly, so I like it better when Tom Brady's sitting on the field crying, but whatever.

So, yes, you've described this very well. So, the people who didn't hear, the Seahawks were on the one yard line of the Patriots. You can see it's fourth down, I mean, it's fourth quarter. There's only 26 seconds left in the game, not very much time, the Seahawks have one time out and it's second and goal. Alright, so, they're down by four, they obviously can't go for a field goal, they must try to go for a touchdown in order to pick up the six points that will then almost definitely assure that they win the game, because it's very unlikely New England would have the time to get it back down the field, so this is a really big deal.

Now, there's an expected play here, which you hinted at. And the expected play here is that Russell Wilson, the quarterback, is gonna hand it off to Marshawn Lynch, otherwise known as The Beast, one of the greatest short yardage running backs in the history of the game. And what he'll do is try to go and score in the end zone, because obviously that would be an easy thing to get past all of these Patriot guys here, and that would be the best play here. This is very, very expected, that this is what is gonna happen. You'll see that that is not actually what gets called. What actually gets called is a pass play to this part of the end zone right here. It spectacularly fails, as Malcolm Butler from the Patriots intercepts the ball.

So, I'm not so worried about you being able to follow the play. What I really care about ... I'm gonna play the video ... is that you listen to the announcer, Chris Collinsworth, and what Chris Collinsworth has to say about this play.

I should just be able to ... there we go. Hmmm.

(VIDEO STARTS)

Al (Announcer): Just fine ...

Pass is intercepted at the goal line by Malcolm Butler. Unreal.

Chris (Color): They tried a pick play Al. They tried to go here but he beats him to the punch. And I'm sorry, but I can't believe the call.

Al (Announcer): Me neither.

Chris (Color): I can not believe the call. You've got Marshawn Lynch in the backfield, you've got a guy that's been borderline unstoppable in this part of the field. I can't believe the call.

Al (Announcer): It's gotta be one of the dumbest calls offensively in Super Bowl history.

(VIDEO ENDS)

Alright. Chris Collinsworth can't believe the call. Al Michaels says, "Neither can I." Now what's interesting there, I think that you heard, is that nowhere in this whole "I can't believe the call" did we hear anything about the mathematics of the play. Right? So we didn't hear anything about, what were the different options, how often do they succeed, these kinds of things. Those are the kinds of things that you'd actually need to know in order to understand whether you can't believe the call. I'll get to those in a second.

But, to be fair, Chris Collinsworth, what's demanded of him here is a hot take. He must actually give his opinion right away, and so let's forgive him his sins, and obviously once people have time to think about it, they're gonna think more about what does that decision actually look like and they're going to give us all sorts of mathematics and they're gonna come to a more rational conclusion after they have some time, right? Oh no, that's not true though, that's not what happens.

So these are people who have now had a whole day to think about it, these are now the headlines that come the next day. What we can see is, these are some major outlets, that there seems to be a battle between was it the worst call in Super Bowl history or just the worst call in NFL history period. That was from USA today, there you go. The Washington Post is nuanced, because they're not saying the NFL history at all. If you go back, you can go and look at these articles, you can see there isn't a whole lot of analysis of the play itself. They just are declaring that this is horrible and it's a terrible play call.

Alright, so what's going on here? This is a little bit weird. It seems to be that everybody's in very strong agreement and yet nobody is talking about what the quality of the play was. So, we can get there if we actually hear what Pete Carroll had to say about it, and we can kind of understand a little bit about what's going on here. Here's what Pete Carroll had to say about it.

This was on Good Morning America, I think. And he was being pressed to sort of immolate himself in front of the public and admit that this was indeed the worst call in Super Bowl history. And this is what he was willing to say, and the emphasis is mine: "It was the worst result of a call ever," adding, "the call would have been a great one we catch it. It would have been just fine and no one would have thought twice about it." So, I mostly agree with Pete Carroll here, I actually don't agree with his last sentence, "it would have been just fine and nobody would have thought twice about it."

So let's just stop for a moment and let's just do the thought experiment about would no one have thought twice about it if it had been caught. Let's imagine that Pete Carroll calls a pass play, super unexpected pass play, and the ball is caught for the game-winning touchdown and the Seahawks win the Super Bowl. Are the headlines the next day, eh, not really thinking about that play? No. Anybody want to take a guess at ...

Go ahead.

Audience: *Riskiest play ever wins the Super Bowl.*

Right. Out-Belichicks Belichick.

Audience: *Yep. Genius.*

He's a genius.

Audience: *Genius, super surprising, yep.*

Now this is important for later in terms of the conversation we get into with Shane, but what you notice is that by choosing the play that he did, he's polarized his outcomes. He's added the tails. There's only two ways it goes, he's either an idiot or a genius, there's nothing in between. So that's why I don't agree with it. Because I don't think there's any math in here, right? Yes, he's gonna get called a genius if that play works out.

Now, here's the issue. That play has the same mathematics whether it works out or it doesn't. And yet what we can see, is that just by that simple thought experiment, the pull of how it actually turns out casts such a shadow over our ability to see whether the decision was good or bad, that we tend to line those up.

And in fact, here's the great thing, we don't actually need to do the thought experiment, because we have a great example of how an unexpected play works at working out, what happens to the way that people view the quality of the decision.

Well, it's New England, so we know it's a Super Bowl, again.

Audience: *Right. Well, I don't like this one as much.*

Yeah, this one's sadder for you. This one ends with Tom Brady crying on the field.

Here we've got, Philadelphia is on the one yard line of the Patriots, so they're in the same spot on the field. In this case, it's fourth and goal, so they've only got one play left. Second down, which is irrelevant, because they've only got one play. But here's the important thing, Philadelphia is up by three, it's 15-12, they're about to go into the locker room. And again, there's an expected play. And the expected play is, go for a field goal. But, mathematically, just so you guys know, being up by six doesn't matter that much compared to being up by three. The mathematics in football tell you that you really want to be up by seven or more, because that's a touchdown, so that really matters. So, Doug Peterson does something really unexpected. He doesn't do the expected play of going for a field goal and instead he goes for a touchdown.

Now what's important is he's gonna pass it to the exact same part of the field. The only reason why I point that out, because there's people who have since made the argument that they should have thrown to the back of the end zone, for the Seahawks, and not to the corner of the end zone. So, they happen to be passing to the exact same part of the end zone here, and even more unexpected you'll see Nick Foles ends up being the receiver. Lucky for us Chris Collinsworth is once again the announcer. So obviously, when we listen to Chris Collinsworth he's gonna say, "I can't believe the call, I can't believe the call. You could have taken the field goal and been sure that you would win, why on earth would they do this?" So let's listen to Chris Collinsworth say exactly that:

(VIDEO STARTS)

Al (Announcer): Fourth and goal. They're gonna snap it and it's Trey Burton who throws, caught, Foles. Touchdown.

Chris (Color): Here we go. They've got all these signals. Shotgun, he would not have been eligible but for the fact he was in the shotgun, not under center. And there's the old basketball play. They talk about Nick Foles, he's more comfortable playing quarterback like a point guard and here he is receiving the pass that is going to be shown a billion times.

(VIDEO ENDS)

I can't believe I was wrong about how he was going to call that play!

So, let's just take a step back and let's look at the mathematics, just very quickly, of the Seahawks play. How many people in the room think that in order to understand whether Pete Carroll's play call was good or bad, that it would be really helpful to know what the interception rate there is? For that particular pass? Right? This is in fact a very important piece of information to understand. So, when we consider all the different possible outcomes, obviously whether you hand it off or you pass, you can fumble, there's sacks, so those are all going to be all things being equal.

If we think about the three outcomes of a pass there's a touchdown, there's incomplete and then there's an interception. So understanding how often those things happen compared to each other is a very important part of understanding what might ... whether this pass is good. So what we're imaging is, what are the possible futures and how often do those futures occur? And then we could then go and see what the advantages are and compare those to the running play. So we need to know that, at it's minimum.

Because what we know is, if it's a touchdown, which happens a lot, about half the time, then he gets hailed as a genius, that's all good. Here's the interesting thing. If the ball is dropped, if it's incomplete, what happens? The clock stops, and it stops really fast. So that's really important, because remember he has only one time out. I'm gonna come back to that fact.

So, let's think about that clock stoppage. Let's just assume that everybody's right in their consensus that the thing you'd like to do is hand off the ball to Marshawn Lynch twice. I'm just gonna give that to them, this is what you'd like.

Give it to The Beast twice. If you hand the ball off to Marshawn Lynch first and he fails to get through the bazillion Patriots which are on the line, which actually in that spot, for Marshawn Lynch, is gonna happen about 80% of the time. I bet you're surprised by that. And then he's gonna have another chance at it. What happens? The only way for you to stop the clock is for you to call a time out, and a lot of time has come off the clock, and now you go to Marshawn Lynch again and that's it. You get your two tries at the end zone.

But if you pass the ball first and the play doesn't succeed, you don't have to use a time out, hardly any time has come off the clock, and what do you do? You hand it off to Marshawn Lynch. Hopefully he scores. But if he doesn't, you burn your time out and you hand it off to Marshawn Lynch again. So basically, what passing the ball first does, is it gives you an option. It gives you the free option at the two plays. So if your goal is ... you can get three plays, if two of them are pass plays by the way, but assuming you want two of them to be run plays, this would be what you would have to do. You would have to do the pass play.

So basically if we think about options there you can have ... you can get to the end zone twice or you can try for the end zone twice or you can try for it three times. But, most options aren't free, so this option is going to cost you something and the cost of that option is the interception rate. That's what the cost is, the percentage of times. Which is between 1% and 2%. Right? It's hard to believe it's 1% or 2% because that's a future that actually occurred. So when that future actually occurs it feels like, well that obviously the thing that was going to happen, right?

So, once we understand that, there's now ... you might still think, oh, well it was a bad play for his own career opportunities or ... I don't know, you could come up with some reasons why it might be a bad play. But, it's not the worst play in Super Bowl history, it's certainly not the worst play in NFL history, and I happen to think it was a pretty brilliant play, myself. So, what's going on? Why is it so hard for us to see past what actually happened, so much so that none of those articles even mentioned any of the thinking that I just mentioned to you? Right, because you can't even see it anymore.

What's going on is this thing called resulting. Basically, this is what we can think about. It's really, really hard to figure out if a decision was good or bad. I mean, I just had to give you a very complex analysis of that play, you have to actually know quite a bit about football, you have to know something about probability theory and I've gotta point it out to you. So this is hard.

So, most decisions, when we look at them in retrospect, are opaque to us. They are not transparent. This is especially in retrospect. So, we're going back and we're trying to construct whether the decision is good or bad and it's not really in our purview, particularly as we're thinking about it quickly, to reconstruct the decision tree or to know what someone's state of knowledge was or to understand what the mathematics of the decision are. That's really hard. So, what do we do? We use a shortcut. We use a heuristic, called resulting. Which is to say, there is a thing that we know, that's totally transparent to us. Did it work out well or not? So, we understand what the quality of the outcome is, so now what we say is, "A ha! Okay, so that tells me what I need to know, I'm going to work backwards from the quality outcome to the quality of decision and there I have my answer."

And that's how you end up with Chris Collinsworth calling ... saying, "I can't believe the call", when Pete Carroll's play doesn't work out, and saying Doug Peterson's a genius when Doug Peterson's play works out, and that's why when you do the thought experiment and you think about Pete Carroll having succeeded in that play, you realize immediately that the headlines would have called him a genius, despite the fact that the decision is the same either way. So the decision quality, in one iteration, does not change depending on how that one thing worked out. It would be like saying if I flip a coin and I call tails and it lands tails, I'm a brilliant coin-flip caller. It's meaningless. We don't have enough iterations of the decision.

So, let's figure out why this happens. And poker can teach us a lot about why this happens. This is a general definition of poker: it's a game of decision-making under conditions of uncertainty over time. Not going to worry about the time part right now, but let's think about what the two sources of uncertainty are in poker. The first is hidden information. Well, cards are face down. So, there's all sorts of information assymetry, there's illiquidity in the information market you might say, there's just stuff we don't know.

And the other thing is luck. So, in between when you actually make the action, you make the decision, and the outcome, there's this intervention of luck. So, anytime you make a decision, there's always lots and lots of ways that it could turn out, and luck is the intervener there. So, even if 98% of the time something works out fine, and 2% of the time something works out poorly, we know that 2% of the time something will work out poorly and when that 2% occurs is completely due to luck. Just don't have any control over it. So in poker, that's very easy to see because of the turn of a card, right?

Why should we be looking at this definition of poker in order to understand decision making? So let me get to hear, does anyone know who John von Neumann is? This is the most hands that ever went up in any room I've ever been in. Does anybody know who John Nash is? Do I have some John Nashes? Again, the most hands that's ever gone up in any room I've ever been in. Now you're gonna be tied with every room. Do you know who Russell Crowe is? Okay, now you're in a tie with every room I've ever been in, I'm sorry, you just went back to the mean, you reverted to the mean.

So, Russell Crowe played John Nash in A Beautiful Mind. John Nash was an economist, mathematician, had schizophrenia, a Nobel prize winner and he was vetting something called game theory. I don't know if you remember that scene where he walks in the bar and it's like how do we figure out who the right girl to go talk to is? He was applying game theory there. His mentor was John von Neumann, who was at the Institute for Advanced Study.

John von Neumann is a really important guy in the history of science. He's the father of the modern computer, not bad. He ran the Manhattan Project, in fact, died in his 50s because he got cancer from doing so. He was architect of our cold war strategy and he came up with the concept of mutually assured destruction. He was a brilliant, brilliant mathematician and economist. He's kind of been lost in the history of science, I think because he was at the Institute for Advanced Study at the same time as Einstein and how are you supposed to compete with the crazy mustache and the bicycle? That was just a losing branding battle.

But, while he was running the Manhattan Project, at night he was writing a book with Oscar Morganstern called The Theory of Games.

And The Theory of Games was the first laying out of the mathematics of games theory. He's the person who thought of this way to think about human decision making. Game theory is the study of decision making under conditions of uncertainty over time. So that's weird, the definitions actually line up very well. That's not accidental. It's not accidental because von Neumann actually based his thinking about game theory on a stripped down version of poker.

So he used poker as the basis to think about, how is that actors are deciding against each other, that's what game theory is about. Or with each other cooperatively, also what game theory is about, under conditions where there's hidden information and luck. The reason why both of those things are important is that it's hard enough that I could know that a coin would flip 50/50, heads and tails, that the luck problem is that I can't predict which it will flip on the next time but I know that over time it will flip 50/50. If you hide the coin from view so that I don't understand it and I can't examine it, it now becomes much harder for me to figure out how often it will flip 50/50. I don't know if it's weighted, or if it's three-sided or four-sided, or both sides are the same, or those kinds of things, because now I can no longer see the coin. So he felt that both of these sources of uncertainty was really important.

Now he was asked by a colleague of his, Jacob Bronowski, hey, how come you based this thing on poker and not on chess, because chess, that's the game. Like, we all hear people say, oh, he's playing three-dimensional chess. And von Neumann's response, this is paraphrased, was "Chess? Chess isn't even a game, it's just a calculation. Poker is a game."

So, what did he mean by that? Well let's go back to the resulting problem. And we can think about it kind of this way. If I go up to somebody and I say … I'll take you here. "I played a game of chess with Shane, and he crushed me. I lost." That's the only information I've given you. What do you know about my decision making compared to Shane's? Shane's was better, correct? And you are right to say so. So, now let me ask you this. "I played a game of poker with Shane. We played for like an hour and Shane beat me. He took my money." What do we know about my decision making compared to Shane? Assume you have no knowledge of my skills. Because by the way, my decision making would be better, but we don't know that. All you know is that I lost playing poker to Shane.

We don't know anything, right? Because we don't have enough iteration. So what we can see is that this resulting, doing this resulting, the thing we did to Pete Carroll, actually makes a lot of sense when you're playing a game like chess. But it doesn't make a lot of sense when you're playing a game like poker.

Why? Because in poker, I can have the very best hand, I can play it very well, and I can still lose. And a worse problem is, I can have the worst hand, I can play it really poorly, and I can still win. Why is that the worst problem? Because, you can think about, "I played it really well and I lost" as an escape hatch, right? That's like, "Oh it was luck, I lost because of that". But getting to, "Maybe I played it really badly and I just won because of luck", that's actually much harder to get to.

And so that actually can cause a lot more ... wreak a lot more havoc and cause a lot more problems. That's actually the main reason why when I thought about, why is it that poker players aren't learning very well, that was the main reason. Because luck creates kind of an escape hatch there, right? So, we can't work backwards in poker. That's what this is just saying here.

So now we can sort of understand, okay, so this is this difference between chess and poker, and we know that when we think about this model of human decision making, and really the best model we have, which is game theory, that this actually based on poker, so probably we want to be looking to poker for trying to figure this out.

We can take this to, really, if we think about any decision we make, we can frame it as a bet. Which is really what von Neumann was saying. So why can we frame it as a bet? Well, we have some limited set of resources, so we're weighing options, we have some limited set of resources that we can invest in any option, we can not take infinite options, we have to choose among options where we're going to invest these limited resources. It doesn't have to be money, it could be time, health, happiness, so and so forth. And what we know is that whenever we make any decision, that we're investing those resources in an uncertain future. That there's always going to be more futures that could happen than the one that actually does happen. As we're weighing the options the difference is that each of those options is going to create a different set of possibilities for the future.

That can express in a few ways. It could create a different range of futures, so you could actually have a different set of futures that could actually occur. It could create a different dispersion of futures, so there could be a wider range … like you could have two that happens with one decision, four possibilities that happen with another, ten possibilities with another, so that's a wider dispersion. It could actually … a decision could actually create the exact same set of futures, but the probability of those futures occurring are different. So in one case this future here could happen 30% of the time, if I take a different option this future maybe happens 15% of the time. And then obviously the quality of these futures might be different. So I could weigh one option where's there's a death future, where it's like total ruin, and another option where all the futures are okay. Nothing super great, nothing super bad, as an example.

These options that you're choosing among, where you're gonna invest your resources, whatever option you take, determines what the set of futures is and what you're basically trying to do is figure out, given my limited resources what's my best bet? What's going to get me to my best result, in a probabilistic fashion over time. So that's why we can think about it as betting. Now, how you figure out what are my options, and how you figure out what are these possible futures that can occur, is all driven at the foot by what your beliefs are.

So this is … we can think about this part here as the luck part, right? Luck is intervening right here, and this part here is the hidden information part. Because, the information that you have in the world is what's informing your beliefs, those beliefs are then informing what you think your options are, which option you think is the best option and what you think those possible futures might be. So, beliefs really come in two forms: facts, the earth is round; and, predictions, the earth will still be round tomorrow.

We know that in order to be really good at figuring out how we're supposed to allocate these limited resources we have in the decisions we make, we have to get the belief portion under control. I'm going to talk about that really briefly, and then we're going to get to this conversation.

First of all, I just want to let you know that our beliefs are not formed very orderly, and we walk around with a lot of beliefs that aren't true. Here's a few of them. Astronauts didn't eat astronaut ice cream.

I was so upset when I found that out. Abner Doubleday didn't invent baseball. That was shocking to me, I was very surprised by that. Here's one that really surprises people, immigrants names were not changed at Ellis Island. And by that I mean, not intentionally by the immigration agents. So, people would Americanize their own names, and sometimes there would be misspellings. But, I've walked around my whole life believing that immigration agents changed people's names at Ellis Island. And then I found out that wasn't true. And that was very, very shocking to me.

Now, these obviously don't seem like very high stakes decisions, but I'm just letting you know that you've been walking around ... I'm sure many of you believe some or all of these things, and probably didn't really question these very much. So, you have beliefs that are like this all the time. Why is this that we're able to walk around with so many beliefs that aren't true.

It really has to do with how do we form beliefs. So here's the intuitive order. You guys can tell me if this sounds about right. We hear something, someone tells us something. We vet the information, because we're all thoughtful people, so we decide whether the thing that we heard is true or not. Then we form a belief about it, true, false. Does that sound pretty intuitive? Like, that's about ... well, yes, Neil is shaking his head in the back. But for most people this sounds about right and this is kind of how you think about it. You're reading a news article, you're pondering it, you're analyzing it and then you're vetting the information, then you decide whether it's true or not.

So, that's not even remotely what happens. What actually happens goes like this. You hear it, you believe it, and then maybe if you have some motivation or time you'll actually vet it. There's some great work by Dan Gilbert, of Stumbling on Happiness, in the 90s, which shows that we really default to true. You can see that research in my book, but I'm going to give you the higher level reasons why this particular thing is true.

Reason number one. For most of human history we had no way to form a belief about something we had not experienced for ourselves. Why? Because we did not have language. So, the only way I could form a belief about something was through my perceptual system. I could see it, I could taste it, I could feel it, I could hear it, such and such. So, if I see a tree, it is incredibly rare that I am hallucinating.

I mean for me, hopefully never, but you know what I mean, people in general. And, it's incredibly rare that we're seeing mirages. There's really no reason to do this. If I see a tree, there's a tree in front of me. Yay me. That's reason number one.

So we have this particular system that's about forming perceptual beliefs that was ... that was how our brains developed in terms of belief formation, then all of a sudden, just a tiny, a blip in time ago, we developed language. I was able to now say, "Hey, there's a tree over there that you haven't seen, but it exists." And evolution, as is does, it doesn't generally take us offline in order to reinstall hardware, it works with what's already there, so evolution was like cool, I've got a belief formation system, now I've got this other way to form beliefs, that's what I'll do. So now when I say, "Hey, there's a tree", you say, "Cool, I believe it." So that's reason number one.

Reason number two is, we have a default of where natural selection actually selects for type one errors as opposed to type two errors. So, type one errors are called false positives, type two errors are called false negatives. Let's think about why that is. I'm standing on the savanna, I hear rusting in the grass, and I go, "Ah, a lion!", and I run away. And so now, yeah, do I run away sometimes when it's not a lion? Sure, but I didn't get eaten. So my genes survive.

But now, I'm a skeptic. And I'm like "Oh, I hear rustling in the wind, I should do a scientific experiment and figure out if this is actually a lion and I should try to figure out what the correlation between rusting and lions is and um, let me ... ", and then I'm dead. So, we have a lot of pressure on us towards making these kind of certain judgements where we sort of believe what our default judgment is. So that's reason number two that we don't really vet it.

And then reason number three is actually super interesting. I don't talk about this in the book, but, let's think about this. One of the ways of the ways we survived, because we did not have big claws or teeth or ... we're not fast, we're not strong, we're actually quite pathetic as animals go, was that we formed very strong kinship groups, and those kinship groups helped us to protect our resources and what not, against other animals and other groups and what not.

Now, let's think about this. We have this kinship group, let's say that you approach the world skeptical. So when somebody talked to me, I defaulted to "I don't know if that's true or false". What would then be the point in talking to anybody in your group? Why would you ever assume that people in your group were lying to you? That doesn't make any sense. It's inefficient, it's not going to help the group along. If we think abut human discourse, of course we believe what people are telling us is true. If we didn't, there would be no reason to ever talk to anybody. Human discourse would completely break down.

So we've got these three big pressures on just believe it. That would not be such a big deal if we got to this step, right? So maybe it's okay that we hear it, we believe it. Like someone told me, even though I'm not an historian, that this happened at Ellis Island and now I've walked around my whole life with this belief, and maybe that's okay if I get to this step, and I actually am willing to vet my beliefs and change my mind. So that's where the big problem comes in. We're very poor belief calibrators ... excuse me.

First, when we see information that confirms our belief we're like, "Yay!". We seek that out. If I took a random person's social media feed, it would be almost all stuff that agrees with their opinions and basically no stuff that doesn't. We tend consume media that agrees with us and we tend to gravitate toward people that agree with us. So we're noticing all of this confirming evidence. For example, when I'm talking to audiences, and I say, "Well, why did you believe this about Ellis Island?", I'll very often get things like, "Well", and this is true for me, "my grandmother's name was Perovsky, but when she came here it was Perry." And I say, "Okay, that's fine, but do you know who changed the name?" And they'll be like, "Uh, no." But they treated it as a piece of confirming evidence, they just haven't really though about it very much. So this is really confirmation bias.

Here's the other problem, we actively work to discredit disconfirming evidence. This is called disconfirmation bias. So, I read an article ... we can think about confirmation bias as this. If I come across an article that agrees with me I'll spend more time reading that kind of article, then one that disagrees with me, which I'll tend to put down faster. But if I do actually read something that disagrees with me, I will write a dissertation on why it's wrong.

So we don't put in the same thought to evidence that confirms us than we do to evidence that disconfirms us. We work very hard to swat away the information that doesn't confirm us.

And then here's the really big problem. Even when we find out evidence is wrong, our beliefs are still affected. I can kind of bring this together with this one study. It's a great study that was done. They took half the room and they gave them a study, a scientific study, lots of data and tables, that was about firefighters and what their risk attitudes were when they were not ... when they were out in their real lives and not actually fire fighting.

So this half of the room gets this data, and the data is labeled in such a way that it shows that firefighters are very, very risk-seeking in their real life. I can come up with a very good [inaudible 00:41:44] story for that. This half of the room gets the exact same data, but it's labeled in such a way that it shows that firefighters are very risk-averse in their real life. We can see that as well. You're running into burning buildings all the time, people are falling down stairs, you figure out maybe I shouldn't be taking so many chances.

So now I give you each, each side of the room, a measurement, an assessment, of what you think about firefighters and risk attitudes, and you guys all think that firefighters are risk-seeking, and you guys all think that firefighters are risk-averse. Okay, so that's all fine, you updated in the direction of the information, we like that. Now I come into the room and I say, "I made it up", to everybody. I made it up, this data isn't real, I was just testing you, ha ha.

Okay, so now you guys go away. And I told you it was false, nothing you read was true. You go away, you come back a week later, I give you the same assessment, and this whole half of the room thinks that firefighters are really risk-seeking and this whole half of the room thinks that firefighters are really risk-averse. Right? I heard a "huh", yeah. Huh. So that's kind of the whole thing. You believe the thing that I showed you. Now you have a belief about it. I now disconfirm it for you, and then you believe it anyway. So, that's kind of sad. I told you I wasn't really going to give you any good news to start.

This is really a pattern that we call motivated reasoning. Basically, we think that when we get information that we process it in an objective way, in order to do some kind of Bayesian update on our beliefs.

I'm glad you're laughing, you should be. So that's what we think. Okay, I'm a rational person, I see the information, I view it objectively and then that now goes and informs my beliefs. But that's not actually what happens. Our beliefs drive the way that we process the information, they change the way that we look at it in order to support the belief that we already have.

We can actually see that in the Pete Carroll/Doug Peterson case. We want to believe that the world is orderly, that results happen for a reason, that things don't just happen randomly in our life, we don't like luck. So, when it works out, we look at it and we say, "A ha, yes, I knew that that play was bad." And when it doesn't work out, we're like, "Yes, I knew that that play was ... when it does work out, "I knew that play was good."

I just like this quote. Simon and Garfunkel. "Still a man hears what he wants to hear. Disregards the rest." So now, just one more piece of bad news. Being smart makes it worse. You guys are all pretty smart, you probably think you're cured now. No. Why does being smart make it worse? Well, two things. One is that data are not truth. So you need a human being to collect and interpret data and smart human beings happen to be better at slicing and dicing data to support their beliefs. So if we think of ourselves as sort of a PR for our own identities, we're all PR agents for our own identities, our beliefs are a big part of the fabric of our identities. We tend to defend them, really strongly, and human beings are really good at using information and data in order to be able to spin a story that fits their beliefs.

The second thing is probably that really smart people have an overconfidence in whatever their intuitive response is. So, let me sort of give you just two pieces here. There's a Dan Kahan study, he's out of Yale, where he gives people data on the relationship between psoriasis and advance skin cream, to see if the skin cream cures psoriasis. He then divides the room up, you guys are all super good at those kinds of those data tables, you guys are not so good at those data tables, and now he changes the labels on the axis to be gun control and crime. And he knows what you're prior beliefs about the relationship between gun control and crime are, and what happens is that everybody falls apart a little. They all sort of look at the data to kind of confirm whatever their prior beliefs about gun control and crime is, but the people who fall apart the most are the ones who are actually good with the data. The skin cream data.

Why? Well that kind of goes to this piece. That if you're good at reading data tables, you sort of glance at it, and you say, "Well, I think this is what the data table is telling me", and you don't realize how driven that is by your desire to affirm your prior, and then you don't really question it more because you know you're good at math. And the people who are not so good at math are actually trying harder, because they don't have as much confidence in their intuition. So this is a little Dunning-Krugerish right here, sort of a little bit what's happening, there. That's a lot of bad news. Slight good news, you can get better by remembering this.

If I took any belief that you have - immigrants' names were changed at Ellis island - and I said to you, I reminded you, that every decision is a bet, and I said, "Hey, do you wanna bet on that?" The same thing happens to everybody. "What? No. I don't know enough about immigration and Ellis Island to bet on it, like, I'll bet a little bit, but I'm not going to bet a lot." So these things that people will express with great confidence, as soon as you ask them, "Hey, do you wanna bet on it?", they actually sort of pull back on it and they're like, "Well not a lot". So it injects this uncertainty back into the equation.

It reminds us that our beliefs are pretty uncertain, that no belief we have is gonna be 100% or zero, and that we actually ... that the future is certainly uncertain, because of the intervention of luck that happens right there. So basically what, "Wanna bet?", is doing to you, is it's getting you to that list, to that betting, that we don't do. So, it asks you to actually do some betting. Where and when did you form the belief, what evidence do you have for the belief, how reliable is the source of the evidence? And then these two things are really, really important. What does the person challenging me to the bet know that I don't know and what are the reason the belief might not be true?

Why are these two things really, really important? Because one of the biggest problems is that we reason from what we know about the world and what we want to be true about the world and the special knowledge we have of it. That's called the inside view. We do a lot better if we think about the outside view as well. What does somebody else know? What is their knowledge about the world? How do they interpret the same data? What are their predictions? How would they view me as an individual? This actually gets us to a much more accurate model of the world.

So the best way, the simplest way of thinking about inside view, outside view, is that if I asked a newly married couple, which I would never do because that would make me a jerk, but if I asked a newly married couple, "Hey, what's the percentage of time that you think that this lovely union here is going to end in divorce?" ... that's why I wouldn't do it, I'd be a jerk. But whatever, it's good as a thought experiment. Hopefully they're all saying zero. I mean, depends on how rational they are, but whatever, they're all saying zero. And I think they really believe it. But if you ... that's the inside view. Like, "Ah, yeah, but we're great".

The outside view would be, "Hey, the newly married couple, this other couple over here that you have never met just got married, you don't know anything about them. How often do you think they're getting divorced?" And they're all like, "50 percent". So they all go back to the base rate. That's the difference between inside view and outside view.

What we want to do ... obviously we want to think about what our own knowledge of the situation is, but we already know what our knowledge of the situation is, we already know what our opinions are, we already know that our beliefs drive the way that we think about the world. What's really important is to fill those knowledge gaps, figure out what is it that we don't know, how might somebody else view this, what's the base rate? That's just a good question to ask, what's the base rate? It's a big part of gathering the outside view. So that when I say to you, "Do you wanna bet?", I'm now forcing you into the outside view. I'm forcing you to think about what do I know, why do I not think that this might be true, what reasons do I have to be challenging you to this bet? So, it's really just reminding you of your own uncertainty.

Really what this idea of framing it as a bet does, is it gets us to, "I'm not sure." It makes us view the world through the lens, not of, "Am I sure?", which is a yes or no question, to "How sure am I?". Which are two very, very different questions. It would be better if we were all taking in this way. Instead of asking people, "Are you sure?", when they're pitching a strategy to us. "Well are you sure, are you sure about this decision?" Instead say, "How sure are you?", which allows some space in between. And that space in between, where we get to acknowledging the uncertainty is just a more accurate representation of the world and our knowledge of it, and it often makes us more open-minded to dissent.

This is important, especially dissent, with our prior beliefs.

So, that's kind of the set up, and what I want to end with, so that we can get to this conversation, is just the last little thought experiment. So I want you guys to take a moment to think about this. We talked a lot about this thought experiment of what if the ball had been caught. What if they throw that ball, and it's caught for the game-winning touchdown, what do people think about Pete Carroll. So now, this is what I want you to think about. Let's say that Pete Carroll does the expected play, and he hands the ball off to Marshawn Lynch and Marshawn Lynch tries to get through the Patriots line, and he fails, which he's going to do most of the time by the way. And Pete Carroll calls his time out and he hands it off to Marshawn Lynch again, and Marshawn Lynch just fails to score. Patriots win, right? They get their fifth Super Bowl through that route. Does anybody want to take a gander … do you guys think that the next day that the Seahawks are like, "What a terrible coaching decision?" Do you think are people are like, "Wow, that was … he really botched that. Pete Carroll lost that game."

Audience: *No.*

No, right? What are the headlines about?

Audience: *No. He did everything he possibly could to make it*

But the Patriots were too good.

Audience: *Right.*

So here's something really important to think about. As we think about what are the categories of luck, what kinds of things constitute luck, the actions of others go into that category. Because, luck is really anything you don't have control over, and I have no control … Pete Carroll has no control over Bill Belichick. Pete Carroll has no control over the Patriots' line, doesn't coach them, he didn't recruit them, nothing, can't do anything about it. What would happen is that while before everyone was blaming his decision making, now everybody's blaming luck. What could he do? The Patriots are just that good. That's why New England has five Super Bowl rings. It's just Belichick. So, that's where I'm gonna end it, with this thought experiment, because that's kind of where I think we're gonna have the conversation go.

And now you can see why Annie is so remarkable. We're just going to have a brief conversation, a little bit about what she talked about, and then we're gonna open it up to your Q&A for her.

The first thing, we talked a little bit about this last week, and one of the things that came up was the ability to make decisions that make you look stupid and then that's impact on your decision making process. There's a conventional decision where you're prone to, no matter what the outcome is, you're never gonna be fired. And then there's an unconventional decision where you get a bad outcome it could result in job loss. What do you think about that?

Yeah. Well I've got a super-loud voice, so I'll repeat. Okay, so, here's the problem. Oh, we should probably ... I guess the screen ... I don't know, we'll leave it ... we can unplug it, I don't know.

This is what Shane was saying is that ... remember I said, there's this very polarized reaction to Pete Carroll's failing with the unconventional choice, which is genius or idiot, that's it. And then if you think about the reaction to him failing conventionally it's kind of like, eh, what could he do, and if he wins it's like, yeah, that was good. Right? Like if he wins it's not like he's a genius. So what happens is that when we think about it, it's like this huge big reward if you succeed unconventionally, and this huge punishment if you don't, and there's all this safety, you take the volatility out, when you fail conventionally.

So, what we know is this. That resulting, when we result on people, we really tie the quality of the outcome to the quality of the decision, is when we feel like there is no transparency to the decision itself, which is gonna happen when you make an unconventional choice.

So there's a variety of ways we can get to transparency. The decision could just be very simple, like I'm ordering chicken or fish in a restaurant, that's super simple. If the chicken comes back bad, nobody's being like, "That was the worst decision you ever made Shane!", because it's just a simple decision.

Another way to get there is that while it's a complex decision, the cost benefit analysis has kind of been done by society in a way that people have kind of agreed to. That would be like, I'm willing to get in a car every day, even though there is some chance of death or accident or whatever, I'm willing to do that. And now we can see that if I go through a green light and I get in an accident nobody is telling me it was a bad decision, because we've all sort of agreed that these are the ... this is okay, and that the chances are getting into an accident are great enough, whatever, we're making that trade-off. And then the other way we can get there is status quo or convention. That these are the ways that things have always been done.

Now we can sort of work backwards to what the problem with resulting is, is that resulting occurs when we're making an unconventional choice, when we're doing something innovative, when we're doing something new that isn't well understood, and so what's that's gonna drive us to do? Avoid those kinds of decisions. So, how can we avoid those situations? And that's where we get into real problems. Way number one is to get false consensus. So this would be bringing in consultants to make your business case as opposed to help you find the truth. Getting in a room and making sure everyone in the room agrees, regardless of whether it's the right choice or not, is just about being able to say, "No, everybody agreed", so that we can kind of fend this problem off. Only taking status quo decisions, that's a way to get there.

Another way to get there would be to always choose the low volatility path. So let's say, for example, that I'm an investor, like a VC, and I've got all these close calls that come on to my desk. On any given ... on any individual decision I can make a very strong case for a no, I could make a strong case for a yes. If I just have a default to no, it keeps me out of trouble. You could see this for example in a sales person who is closing deals lower than they could because they're not willing to ever push to the breaking point because that keeps them lower volatility and it just keeps you out of that idiot box.

Right.

Because you're just not being questioned about your results so much because you're just winning a little and losing a little and never much more and so you never have any kind of spectacular outcome either way or you're just keeping yourself out of making decisions in the first place. So this can start to really … basically what happens is that our risk profile gets really distorted, by the fact that we know that people are gonna result on us, and we start to actually become very risk-averse in our decision making in order to avoid this problem because it does … it carries big career risk.

And not just career risk, but also … we can think about our lives as a career, and what is future Shane gonna think about past Shane's decision, and that doesn't feel very good either. So, we're sort of trying to protect our own cognitive careers, our own identity careers, but then also there's real career risk to those kinds of decisions.

I look back on my sixteen year-old self and I do not approve.

No (laughs).

One of the … as you were saying that, I was sort of trying to reconcile the individual identity we have of ourselves and how that affects our beliefs, and then a group identity, and then mapping that to a decision that is … how would you map that to how we form beliefs and then what about climate change? How should we think about that? Where we have an outcome that may be catastrophic and we collectively look around and nobody's doing anything about it, so we feel safe in not doing anything about it, and the costs of doing something about it might be really high, and the outcome might be really complicated and messy and gnarly and there might not be a clear path.

That's a really interesting question, I've never been asked that before, so I really appreciate the question, that's really good. So, let me answer it first of all on an individual level, because I think that we face those kinds of issues all the time … is that, we're always trading between present us and future us and present us gets a lot of preference.

One of the things that we can think about is how much pain is present me feeling right now? You can think about it in the reverse as how much does present me want that donut versus future me would be really happy if I didn't eat the donut, for example.

And so we have all this cognitive pressure to be favoring present us, and that actually works out quite badly because while I might be doing something great to make present me feel better, whether it's a donut or a poor decision, or deciding that I lost a hand because of luck, because God forbid I actually took responsibility for it, that might feel good right now, it's very, very bad cumulatively for future me. So one of the things that we want to do as an individual is to really get in touch with what is future me going to think about that. So as we're facing those kinds of decisions we can say this can work in both ways. "How do I think I'm going to feel about this in a year?", for example. And very often you're like, "I really wouldn't be very happy if I ate that donut in a year because I'm going to have heart disease". So that would be bad.

Then it can also actually help us with analysis paralysis. Sometimes we get really caught up in decisions that we think are very high stakes, but they're not, and as soon as you say to yourself, "Is this really going to affect my happiness in a year?", you realize, no. And that tells you that the decision, it doesn't have high stakes and so you shouldn't actually be spending much time on it. For some decisions you can literally do, "How am I going to feel about this in five hours?", as you're agonizing over what to order on a menu, if you say, "Is this going to affect my happiness at all in five hours?" The answer is no.

No, I mean unless you get food poisoning. But whatever, that would be rare. That's on an individual level. On a societal level, and I think it's a problem with group decision making all the time, this is really, really, really, really hard. Particularly when it's a problem like this, which now has this whole tribal identity thing attached to it. I can tell you that the research shows that the only way to kind of turn that boat around is to actually have someone out of tribe start signing on. Obviously there's an alignment between Democrats and saying no, climate change is a really big problem and Republicans saying climate change is not real. It's going to require Republicans getting onboard in order to move the ship because this delusion of responsibility, it's too great to overcome on a societal level.

The good news is you can overcome in a small group, like an enterprise group. But to do it on a societal level, you have to get to a point of consensus where people from the other side agreeing and that will actually start to get action.

I want to come back to the analysis paralysis just for a second. How do you advise people to get out of analysis paralysis. What if they're in a relationship and they're not sure they want to leave or they get offered a new job and they just end up constantly thinking about the current situation that they're in, they don't know what to do about it and how would you think of a problem like that where the information is never going to be fully known, your feedback is gonna be after you've made a choice?

That's a very good question, thank you.

They'll get easier.

This one actually I've thought about. There's a lot of different paths you can take here. Umber one, figure out if the decision is reversible or not. When you think about type one and type two decisions, reversible or irreversible, you should spending more time on the irreversible decisions. By irreversible, I don't really mean irreversible, irreversible because there are very few things that are irreversible besides death. Most of them are reversible, it's just what's the cost to reverse?

We can think about if you break up with somebody and then you change your mind, you're gonna have to try to win them back, for example, and there's very high cost in trying to do that, or maybe there isn't but most of the time there would be. If a move to a new city to take a new job and then I decide I don't like it, there's a very high cost to me to actually turn that ship around. If I rent an apartment and I move to another apartment, it turns out I don't like the neighborhood, it's not that big a deal for me to go find another apartment. That's the first thing you should always ask yourself, what are the stakes of this decision? How much does this cost, is question number one, for me to reverse this?

Then the second question is to think about the range of outcomes. If I think about the really bad outcomes, how bad are they? It could be that you have a decision that's actually a very high cost to reverse but all the outcomes are okay. There's nothing really bad that comes from it. There's no career ruiner, you don't end up destitute, or any of those things. But you could have a decision where the one really bad thing actually is, then that raises the stakes as well, so you kind of need to think about how often is that thing going to occur? What's the payoff I'm getting in return? Those kinds of things. You want to take a little more time with that.

Number one is, if it's a reversible decision, if it's low stakes, just don't take too much with it. The reason why you shouldn't take too much time with it is just because of what I showed you. We have an illusion that we can somehow come to a certain conclusion, but we cannot. Just lose that illusion and realize it's always uncertain, particularly when it's low stakes, whatever. That's kind of number one. Number two is set a decision time limit on yourself. What we don't want to do is get so caught up in analysis paralysis that we lose opportunity, that it costs us too much time. We want to think about as we're trying to gather more information or gather more certainty about the decision, there's a cost for that. It does not come for free. Always figure out if the cost is gonna get you what you want in return.

There needs to be either a good payoff to the cost, it must be that it's actually gonna change your decision enough to make it worth the cost whether it's time or resources or opportunity for you to go and actually do the extra analysis. By the way, the answer to that most of the time is no. You're just creating an illusion that you're more certain but it's not actually very helpful to you. Think about what's the cost to me and then also think about how long do I have to make the decision. If you have to make the decision within a week, you have to make the decision within the week, so just make the best guess because you can't be sure of what those future are gonna be regardless. That's the second thing, is to really think about the cost of gaining more certainty and is it worth it to me in the return. If I'm gonna go from 60% certainty to 62%, why I am even taking my time with it?

Number three is really let go of the idea that certainty and confidence are the same thing because they're not. They're totally different things. We are much better decision makers when we embrace the uncertainty in our beliefs and our own decisions.

There is some data on that, which I'll get to in just one sec, but basically, I can say to Shane for example, I'm weighing three options. Option A is 60%, option B is 25%, and option C is 15%. Option A is the clear winner here but I've said that I only think it's gonna work out 60% of the time. What I said, I said with great confidence and I'm quite confident in my analysis of that, but I've also told you that I'm quite uncertain. Those things can live beautiful in the same space, and actually, Shane is gonna become a better partner in my decision with me if I make that very transparent to him. Not only is he gonna help me make the decision but later he's less likely to result on me. This is a way to actually help people along to allowing you to make these kinds of more interesting choices.

Transparency of process and thinking allows people to be in there with you.

Exactly, because one of the things I said is resulting happens when the decision isn't transparent. It's kind of a little bit on me to make it transparent to you. Once we've decided, we sat down and said this 60, 25, this is 15, the 60 is the clear winner. We can stop now and ask ourselves the final question, which is cost of information. Is there a piece of information that I could find out, there's something I could know that would significantly change the probabilities enough that B or C would now become the winner here. If the answer is yes, there's a following question, at what cost? Do I have the time to get it? Do I have the resources? Is it gonna improve the ... For example, if the decision is super reversible, probably there's no reason to go find that piece of information out. For a more irreversible decision, you'd explore that question more. If it's the right cost to go get that information, then fine, go get if. Then if the answer is no, make the decision.

Recognize, write down what all the possible outcomes are because a lot of what gets us into paralysis is the feeling after the fact, after we know how it turned out, which is, I just want to tell you, something you can never know beforehand. But that feeling after you turned out of this sort memory substitution happens that somehow you should have known that or you did know it and you didn't pay attention.

If you write down here's how certain I am, and here's the different ways that I think things can turn out and I'm kind of taking a stab at how likely those things are, and you put it on a page, now when the actual of that set occurs, the actual outcome happens, you're much less likely to have that feeling of I should have known. Why didn't I take more time with the decision? Why didn't I see this coming? All of those things that go along with it. Because you look at the page, and you go, that was here.

Very occasionally, you're gonna find out that there was something you could have known beforehand. It's like, all right. But there's lots of stuff I don't know that I don't know but now I know it, so that's great because that'll be better for the future. Then that really allows you to free yourself up to be like, whatever, I'm just gonna decide.

One more question and then I'm gonna open it up to the audience here. Yesterday, we were talking about decision trees. I'd love for you to walk us through at a high level how we can go about forming those. You had a beautiful metaphor for the alternative histories and they get clouded into the view of the tree. If you can explain that to everybody, I think that would be awesome.

I was talking to Shane about the books that I have due in a hot second here. Let me give the metaphor first and then I'll take that into how do you build out a decision tree. Basically, you can imagine that when you're thinking about a decision, what am I gonna do, you can see time as if it's a tree. A tree has many, many branches. You can imagine that that tree is all the possible futures and then the thickness of each branch would be the probability of each of those futures. Obviously, if you have a branch coming off another branch, coming off another branch, coming off another branch, if you look at a tree, those are all smaller because obviously, as we get deeper into the iteration, those things are going to be less probably because of conditional probability.

We can imagine, there's all these different branches and we can see them all really, really clearly when we're standing before the decision. Then what happens is that now the future unfolds as it does, and we have an actual outcome. One of those branches has occurred.

Our minds take a chainsaw to all the other branches that used to be on the tree and they're now laying on the ground, and the only thing we can see is the thing that actually happened and that looms incredibly large in our memory. It's like we can't even remember that there were lots of ways that things can turn out. I'm sure that you've all had this feeling of someone saying, I told you so. Like announcer voice they did not tell you so. I knew you'd hate it, I knew you'd love it.

Then to ourselves, how could I not see that coming? I should have known. Of course, it feels like you should have known when that's the only thing left on the tree. That seems obvious. It seems inevitable. It seems like it was totally predictable. But the only reason that's totally predictable is because it's the only thing left. What we want to think about is how can we pick those branches back up off the ground and get them back on the tree so that we can see it more clearly. Because here's the problem, the only way we have to learn is from our own experiences, right? It turns out that our own experiences are just one of many paths that the future could have taken and that actually clouds our ability to go back in and say, what's a good decision, what's a bad decision.

What ends up happening is that something works out and you're like, clearly that was great. Therefore, I'm just gonna make that decision over and over again, which can be like a humongous mistake because you could have been driving drunk and just got home safely. Trust me, there's so many decisions that you're making every day where you're just driving drunk and you just happen to get to the garage safely, and you don't realize that you were driving drunk because you never go back and examine it because it just seems so obvious after you got home safely that that was obviously a good thing to do.

Then you're also gonna not do decisions that were totally great. You're not gonna pass the ball when it's mathematically, demonstrably, by options theory, which is more game theory, and then also just by math itself at the base of it the math is better, and now you're not passing the ball of a sudden. We've seen this at play actually, in the NFL. They've been very, very slow to adopt these really amazing analytics because they're just like, it didn't work once and the fans were mad so I'm done. Right, okay. How do we do that? It's about actually creating those trees for ourselves so that we keep them in view.

Let's think about what does a rudimentary decision tree look like? Let's think about first of all, we can there by thinking about it in retrospect. If I'm thinking about Pete Carroll's decision, I've got the outcome that actually occurred and that's the interception. Now, what I can do is I can build out. I've got the decision here and the decision is pass. I've filled in the decision that's a known. Now, that's leading to all the possible outcomes. Now, the possible outcomes are a fumble, a sack, an interception, an incomplete pass, there's a touchdown, I guess you could have penalty on there, you could get really crazy and be like a fan runs on the field but there's no reason to do that because that's a really low probability but you could do that.

Anyway, now you've actually gone back to think about, if I were to put myself in the shoes of when I was making the decision, what are the different ways it could turn out, and now let me try to figure what percentage of the time does that happen? In order to answer that, you have to look at base rates. This immediately puts you to the outside view. Now, you've reconstructed that trade to the best of your ability, which right there helps you. That's in retrospect.

But now we can think about well, we can do that for any decision forward thinking as well. The simplest one would be I'm think about only one choice, right? Do I want to have this tea? I can think about what all the other possible future are? Normally, we're weighing options. We would build out a tree for option A and option B. We'd figure out what the different outcomes are for each of those. They could be the same, just different percentages. They could be totally different. I'd figure out what percentage of the time do those occur? An example is then we want to think about how much luck is gonna be in the outcome? How much can I tolerate that?

A good example would be I could have one decision that leads to one outcome 98% of the time and another outcome 2% of the time. I could have another option that leads to that same one outcome 98% of the time but then in that 2% of the time, there's 10 possible outcomes. There's more luck in the way that one turns out because there's just more dispersion of results. It's less predictable which thing is gonna work out even though in both cases I know 98% of the time the same thing will happen. It's what happening in that 2%. Obviously, most of the time you don't have that kind of imbalance, I'm just doing that to show you the imbalance.

Now, I'm weighing options. I've got a percentage and now I can calculate an expected value, that's first. I can say, here are the good things and here are the bad things among those outcomes and I can figure out how often do the good things occur and how often do the bad things occur and that's just an average of those percentages. Then I can say, what's the payoff for each of those things? I could make a decision where 2% of the time it works out really well but for every dollar I invest, I'm getting $1,000 back and I'm perfectly happy to do that, assuming that somewhere in the 98% of the time that it works out poorly that I can tolerate what it is that happens.

You can get more complicated and you can do if this, then that. I could say if I make this decision then this will happen and then from that there's three outcomes that could happen. That's a good thing to do too once you get a lot of practice at these decision trees. The one thing I will really warn you is it's really bad to go more than two levels deep in there because we're just not good at those kind of conditional probabilities and so there's not a lot of use to it to go more than two deep as you're thinking in a forward motion.

But when we do think in this forward motion, we think here's the decision, here's all the different outcomes that occur, here's the percentage that I think those are and I'm gonna broadly divide them into good and bad and then sort of take an average and now I can actually weight my options this way. What you define as good and bad, I just want to be clear, is based on your own values and your own goals and that would be different from me than you. You could go into a restaurant and want the most tasty thing on the menu and I could go and want the healthiest thing on the menu, and what we consider a good or bad outcome there is gonna be different for the two of us. That's fine. You define for yourself what good and bad is.

What does that do? That puts the tree in front of you now. Now, when the one thing that happens occurs, you still have the tree and you've dulled the chainsaw. Cognitively, you can never get rid of the chainsaw. You just can't. The outcome is always gonna cast a shadow over this stuff, but the more that you do this advanced work, it acts as a prophylactic for this problem of what happens once we have the result because that result just takes all this cognitive space. It will shrink the cognitive space intake. It won't get it to the right size but it will get it closer to the right size, and that will make all the difference in the way that your lives turn out.

I think with that, we'll open it up to questions.

Audience: *Annie, thanks for joining us. This has been really interesting. One thing that I'm thinking about is, you've brought a lot of ideas to us about how to make better decisions. If we want to make this into almost like an automatic behavior, what's the thing that you would practice? How do we make this practical, so that I can get better at doing this naturally?*

Broadly, the best thing that you could practice on your own is when you are thinking about a decision, when you are thinking about a belief, when you are reading something and you form an opinion about it, the one thing I would tell you to practice is why am I wrong? Include that in your dialog with yourself. You can do that as a time traveling exercise. You can say, why am I wrong? Or you could say, I'm gonna find out in a year that it was wrong, why do I think that happened? If you just practice that on your own, that will be huge. Because why am I wrong is a question of what's the outside view? That's what we want to be getting to, so why am I wrong is really important.

Second thing is take am I sure out of your vocabulary and change it to how sure am I. That's another wonderful way to do it. That you can do on your own. But the best thing, the main thing that I can tell you is find some people to do this with. Lucky for you, you've got a lot of people in the room, maybe you guys can join up a little bit. The reason why is that at our base we're all wrapped in a cage pressing a lever for pellets. The question is, what do we consider a reward? That's the question. What is that we're pressing a lever for? For most of us, we're sort of born pressing the lever for I'm right, and by right I mean, the thing that I already believe is true. That's not what you want to do. We're all pressing a lever for I'm right, ooh I feel good, I'm right, ooh I feel good. That's how Twitter works. I'm right, I feel good. I'm right, I feel good.

What we'd like to do is switch that to be I'm accurate, I feel good. What comes with that is that … I just actually had this experience. I'll give you an anecdote. I found out I'm wrong, boy that makes me feel really good. Let me give an example. I've been having a very dark view of the internet recently. I happen to be lucky enough to have a conversation with Mark Andreessen who said to me, "Oh, I think the internet is great." What? Because I was so caught up in my own view of obviously, social media is the death of everybody, darkness, and apocalypse.

He said, "Let's think about this. We've had a bunch of cases recently of little tiny snippets of video that have come out and there's a million hot takes. This person is a horrible person or whatever." Feinstein, the Jesse Smoller thing is an interesting one, and then the Covington thing and all this. Some minute of video comes out, everybody decides. Everybody is yelling at each other.

Then he said, "Think about if it was 1973, that would be the end of it. It would go down in the history books with whatever that original take was, but because of the internet, we get to see the whole video. The internet is a way to pull back the curtain." I said, "Oh, I hadn't thought of that before." I've been feeling very dark about the internet. I still think the demand for hot takes and certainty is actually quite corrosive to our country, but now I realize there's this very positive side to it, which is the curtain gets pulled back.

Okay, I felt amazing about being wrong. I really did. I had announced this thing with certainty. Clearly, the internet is bad. I got slacked away on that. I was like, this is so great. I have a different view, but that's only because I had people around me as I was growing up as a poker player who were rewarding that way of thinking, so it became a new habit of mind. Just like you can change your habits about going to the gym and that's easier if you have people to go to the gym with who are supporting and saying this is so great that you're going to the gym and saying, do you want to have this chocolate cake with me, which would be really bad. We can think about this in terms of how do we create community around decision making such that we've got gym goers with us and not cake eaters with us, so that when you say to me, I changed my mind, I'm saying, that's amazing. That's the best thing that you can do is go find those people who are really into changing their mind, are really into open-mindedness.

Audience: *Hello, thank you very much for being here. It's been super interesting. I have a question about a decision that I'm making right now. I'm curious if you can give me general advice. A friend of mind called me the other day and was telling me about his startup where they're not gonna make payroll this week. I'm like, it seems like you ran full speed off the cliff. I'm confused. What has gone on? I'm curious what advice you would give me about analyzing someone else's decision making process without falling prey to this resulting thing?*

That's actually a really good question. First of all, let me just say, let me just talk about how not to get into that situation.

Audience: *Money in the bank?*

That would be helpful. We naturally reason about why we're right. Part of naturally reason about why we're right is we also naturally reason about why we're gonna be successful and why the strategies we're implementing and what's going on in our lives is going to turn out well. What we're not so good at, is why is everything gonna go wrong? One of the things we want to put into a process as we're thinking about what are our goals or what are our challenges is to think backwards from the end result as if we're standing on top of the mountain instead of at the base where we can't really see the path. One of the ways that I like to think about this is if you're at the bottom of a sheer cliff, you can't figure out how to get to the top. But if you're at the top, you might find out that there's a gradual slope behind you, but you have to be up at the top in order to be able to see this path to figure out how you get up there.

It's the same with the way that our minds think. If we think we have a goal, we want to make payroll, for the next year we'd like to make payroll on time. We imagine it's a year from now, how did we make payroll on time. That's called a back half, that's a positive version of it. That gets you a little of the way. But what we really want to ask is, it's a year from now and we failed to make payroll, why did that happen? That's called a premortem, it's examining the death before it happens instead of a postmortem. Why did that happen? Most people don't want to do that because they feel like it's not being a team player or being a naysayer or whatever it might be.

But actually, taking the pain, that's actually a trade off between future and present self. Taking the pain in the present of imagining your own failure is what actually helps you to avoid the failure because now you can see the path. The back path kind of allows you to see some of the ways up and then the premortem allows you to see that there's a boulder in the way that you might want to move or walk around or that kind of thing. That's number one is engage in really good process beforehand.

Number two that I would say in terms of how do you avoid these problems in terms of analyzing somebody's own decision is actually just walk them through it. Can you help me understand what did you think the possible outcomes were? What did you think the payoffs to those different outcomes were? What were the options that you had at hand? That's the different decisions that you had at hand. Really actually just be curious and ask them questions in an open-minded way where your mind is really open. Then another is that I would really use the mental model of Hanlon's razor, which is just really important because it does create open-mindedness. Don't ever assume someone was stupid or malicious or did something with bad intention, just assume that this happened because they didn't see it or they didn't that this was gonna be the consequence and really try to understand why did they not know this was gonna happen instead of why were they so ridiculous, they had to have known that they weren't gonna be able to make payroll, this is insane.

If you approach it is as this other assumption, it will cause you to actually have more open-mindedness to listening to what their process was. Particularly, if you approach with them as an exploration of I'd like to understand your thinking because obviously we need to fix this decision going forward to let's figure out why you were such an idiot, which is obviously very judgmental. They're not gonna engage in that process and it's not gonna help either of you in terms of understanding. Does that answer your question-ish?

Audience: *Yeah.*

Okay.

Audience: *Hi, how can you know if or what kind of clues or heuristics can you develop to know if you haven't thought of everything yet in a decision. You've maybe drawn out your tree, you've talked about the outcomes and the different things that you can influence. Is it always true that you should arrive at an answer that you're reasonably confident in or if you can't come to one, is there more exploration you can do? Is there a trade off there? Sometimes I find myself with tunnel vision and I don't know that I've got tunnel vision until what feels like way too late in the process. I'm wondering if you can I guess talk about how to mitigate that sooner.*

Sure, so my short answer is you can't know and just get okay with that right now because there's always incomplete information, you don't know what you don't know. Sometimes you don't know you didn't know it until after the fact. That's number one, is that you really can't know it. But you can get a better clue by understanding what are the general things that would be involved in this decision. There's some decision hygiene that I would suggest that will help you to not get too far down the path.

Decision hygiene number one is create checklists. You can kind of think about this in terms of the hiring process. If we have a discussion, we're trying to hire, and we think about what are the qualities and the qualifications that we need from this person, we now create a checklist and we can actually weight those qualities if we want, but what it does is it stops us from if we just happen to be enamored of a particular candidate going off of these core qualities that we have agreed, and qualifications that we have agreed need to be there with some weighting, so that if a high weight thing is not there, we not like, but he's so charismatic, and that doesn't happen.

That's number one. Think about for whatever decision you make, because very often decision repeat. What are the key pieces of information that I need in order to be able to actually think about this decision and make this well. Do that in advance of ever approaching the decision as much as possible. In poker, I need to know what was the position in the hand, what were the size of the stacks, had you been willing or losing. There's a whole bunch of stuff that's on my checklist. If I'm trying to get advice from Shane and I can't provide those details, and we're in a decision group, you actually won't give me advice. The reason why you won't give me advice is not to punish me, it will be that you know that that advice will have no fidelity because I haven't given you whatever is on this checklist. Number one is checklist.

Number two is if you're in a group decision, make sure that as much as possible you're listening to feedback on the decision separately before you come together as a group. One of the issues with some of this decision stuff and you can see this from the see fault to believe that we infect each other with our beliefs. There are two ways that we can do that. I can express my opinion about what I think is the right answer, I can tell Shane what I believe, or I can tell him the outcome of my decision.

If I tell him whether I won or lost the hand, for example, I've kind of ruined it. That can then lead us down these very bad paths because now we don't realize how much we're both affected, and I thought I was helping myself by having Shane help me but I've actually made it worse.

As we're thinking about like for example, if it's a hiring decision, we should interview separately, we should fill out this checklist separately, and then we come together to discuss. If I'm talking about something that's already occurred, I leave it out. I describe my decision only up to the point that I'm asking for advice and no further. I do not allow him to have a view into that. That's actually a really good thing to do. Quarantining becomes incredibly important.

Then number three is that as you're moving through the decision process, make sure that you're doing good red teaming. People talk about devil's advocate. I have a very dark view of devil's advocate because devil's advocate by definition is sort of like, let's pretend to argue against each other, and it ends up straw manning. What you'd actually like to is steel man. What I want to do is think about what's the best argument against this decision that I'm trying to make and you want to have these stop and think moments during the decision process where you're saying what's the best argument against?

One of the best ways to get there is, if I find out later that this decision was actually poor, what are the things that I'm gonna know? What are the things that I'm gonna find out that will happen? What will have occurred that will let me know that? Some of that then you find out is the I didn't know it, but I could know it category. You can now go find that stuff out assuming that it's at a reasonable cost, which will then stop you again from getting down that big tunnel. Making sure that part of your decision hygiene is why am I wrong? That you're asking that as you start to form an opinion about it, as you start to crystallize the opinion, and then here's the most important point. We have consensus. You three over here, if you have the time, go take a day or two and come back and tell us why this turned out horribly and why we're wrong and why this option is actually not the right option.

People generally, once they've gone through the process and they've argued with each and stated their cases, once there's consensus in the room, they think good we're done.

That's actually the point where, that's the most important point to go off and create a seal map for the other side, so that you just come back and you have this check because consensus is a very powerful drug. We want to make it part of our process that we don't do that.

What's really nice about this idea of having these stop and thinks like why are we wrong, imagine that this didn't work out, imagine it turns out there was a better option, why do we think that would have happened, okay now go off and steel man, is that one of the things we want to give space to in any decision process is the people who are natural pessimists, the people who think different than we do. One of the problems, the competing on a team is that this team player like I want to be on the same page, I don't want to be saying everything we do is gonna fail. None of that feels good to us. By building into process these kind of red team processes, these premortem processes, you naturally give voice to those people.

In fact, you change the rules of the game such that the game of the premortem is being the best naysayer in the room. That allows them the space to exist in a way where they feel really good about being part of the team now and you keep them around. That's actually incredibly important because one of the things that tends to happen is that those people naturally self-select out because it just doesn't feel good to be thinking differently than the group. That's what you don't want to have happen. Just make sure that's part of that hygiene of your decision is why I am wrong? Why am I wrong? Why am wrong? As you're moving down there, it's gonna stop you from getting too far down a path.

Audience: *Hey, Annie. Thanks for being here. Great talk today. I actually wanted to ask you a poker question and ask it in the context of trying to think through how our brains work once we gain information in sort of a dynamic setting. How does it work for you if you have a good hand to begin, and then how does that affect your decision going forward? If I'm an amateur player and I get two aces, my first judgment will be, well that's a very good hand, I should win. Can you walk me through how that all plays a role? Especially as you're thinking about, because every time you get new information, you have to update it.*

Right. Generally, you're a little bit talking about both confirmation bias and whatnot where how much are you convincing yourself that your hand is still the best hand and also there's some cost problem.

Once you get deep into a poker hand and you have money already invested, you feel like that money belongs to you somehow, which it doesn't by the way, it belongs to the pot. Therefore, you're more likely to err on the side of continuing to play in order to try to get that money back as opposed to cutting your losses, which by the way, which is a concept that [inaudible 00:35:18] came up with so we're back to him.

The broad answer would be I think that again, it has to do with what's your habit of mind. How much have you thought about what's my goal at the table? Is my goal this hand? Or is my goal winning broadly at the table? This takes quite a bit of practice. But for me, I have no love of any hand that I play. I don't consider the money that I've already put in the pot to have anything to do with me. I'm taking a very clear view of it, I'm saying there's $300 in the pot, I have to call $100, I have to win 25% of the time to break even. Let's figure out if I can do that here. There's a variety of ways I could do that. I could bluff, I could have the best hand, let me think about how that would work. If it's the last bet and I just have to call, obviously bluff goes out, so my just has to win 25% of the time.

It's essentially like a decision checklist. I understand I have to look at the pot, I have to think about how much I have to bet, I have to think about you as an individual. What's the range of hands that you have? What's the range of hands that you might think that I have. Given that range, how do I think that you might react to different things that I do. The only thing that matters for what happened on previous rounds is that it's informing what I believe your range of hands is. It's informing whether I think you would be willing to fold if I bet a certain amount. That is the checklist that I'm going through at any moment in the hand.

What's really good about that is that it just stops me from getting too attached or emotional about the hand because one of the things that we know is that a lot of these are coming from your limbic system being lit up, particularly if you're playing something like poker, your amygdala gets super charged because that's the danger part of your brain. When that gets super charged, the thinking part of your brain, your prefrontal cortex, actually gets shut down because they have an inhibitory relationship. I'm so mad, I can't think is an actual thing.

By keeping myself to this checklist, here are the things that I need to know at any moment in this hand, I am naturally keeping myself in my prefrontal cortex and that actually is causing an inhibitory effect the amygdala.

Back you your question, why am I pretty good at that? Because I had a group that I knew I was gonna go talk about these decisions with later and they were gonna ask me all those things that were on the checklist. What was the person doing? Why did you think you had the best hand? How much money was in the pot? What were the stack sizes? How much did you have to call? Why did you think they had that range? If they had they had range, how did you think they'd react to a bluff? I know I'm gonna get questioned about it later. What that means is that because I know I'm gonna be accountable to these details that I'm trying to work through, that then I'm processing what's happening at the table through those details as opposed to through, I'm just stuck because I'm mad that my aces maybe aren't good anymore.

This is why it's so important to have somebody that's gonna hold you accountable to it because it's not just that when I'm talking to Shane trying to work through a decision that he's gonna help in that moment. But when I'm away from Shane doing whatever it is that I do and deciding about whatever it is I decide, I know he's gonna hold me accountable to those same things and it changes the frame through which I view the information because I don't want Shane to be like, I can't give you advice, you didn't remember any of those things. That's the broad answer.

Then the other thing that I just want to say, just to clear, I'm bad at this. No, I am. But I'm way better than I would be if I weren't doing this. Do I sometimes get caught up because my aces lost for the sixth time in a row? Yes, I'm a human being. But I do it less, number one. I'm just gonna do it less. I'm going to tend to be out of emotional mind more. I'm going to tend to be thinking through this rational frame a lot more. Then the other thing is I'm gonna catch it a lot quicker. When I do actually go down the path, I'm less likely to get as far down the path because I'm more likely to pull myself out of it either because I happen to run into Shane and he stops me from doing it or because I remember I'm gonna go have to talk Shane later, and so I'm not as far down the path before I figure out that there is a problem.

That's what the accountability does. It actually re-jigs your habit of mind, so that you're more often thinking rationally, you're more often at the right tail of what you best decision quality is. You catch it more quickly. Eventually, what happens through this reinforcement is I can shift the whole distribution of my decisions to the right a little it. If you can make those 2% better or 3% better or 5% better, you're making thousands of decisions every single day, think about how that plays out over your life. It's amazing what that will do for you in terms of your return is. You don't have to get that much better at this in order to have really big impact on your life.

Audience: *Can you speak a little bit about base rates and the outside view, especially if the decisions you're facing don't have enough sample or enough data to go around?*

Yeah, that's actually a really good question. A lot of the decisions that we're making, we're dealing in unknown probabilities. The thing that I say about that is take a stab at the base rate. The reason why you want to take a stab at the base rate, and I'll give you some ways to get there, is that if you don't take stab at it's zero to 100. You're just not thinking about it and you're not taking it into account. One of the things that we know is a problem, is that broadly we can think about stuff we know and stuff we don't know. In the stuff we don't know, there is some stuff we could know. We want to be poking at that box all the time. By merely asking the question, what's the base rate, you're poking at that stuff I don't box. Because what you're asking yourself is, what's the information that I could go find out that would help me to come up with what a better base rate is?

Look, here's the deal. Maybe all you call do is say, I think the base rate here is somewhere between 30-70%. That might feel useless, but it's not because it's not zero to 100%. That's actually a lot of information. You've really narrowed it down a lot to get to well, it's probably somewhere between 30-70%. Then what happens because you're trying to take that guess at it, is that you start digging around. What information could I find out that could get me to somewhere between 32-68%? Because that's better or maybe I could even get to between 40-60%. Oh my gosh, that would be amazing.

It starts you to push on that, what's the information that I could go find out so that I could get it out of the stuff I don't know box, and get it into the stuff I know box?

Part of the best information that you can get is to go ask other people what they think. What would you guess the range is? You would go find people who maybe are more expert in it, who maybe can look at it a different way and say I understand that there's not a lot of data about this problem but here's all these other problems that are related. There's components of them that are related to the problem you're thinking about. It's not gonna be perfect, but we can look across all those things because they have related components and that might help us actually narrow it down.

I don't want you to think that a base rate is only useful if we know an exact number, if we know that the base rate for divorce is 50%. Because it's incredibly useful if I know that the base rate is between 20–70% of the time someone is getting divorced. That's so much better than not trying at all, particularly as we start to push on okay, how do we think about how much luck is in here? How do we think about what is it that we don't know? What could we find out? Who could we ask? What could we look at? It's that nudge that pushes you to get better at that. The answer is never zero to 100%. The answer is never gonna be I don't know because you're a human being who lives in the world, so you know something about most things or you can go find somebody who knows something about most things, so you can get it away from zero to 100. Does that? Okay.

Audience: *We've talked a lot at this point about the importance of having a group, an accountability group, so my question is more about people who are outside of that group. Something in your book that I thought was very interesting, [inaudible 00:44:11] truth seeking and trying to see the world objectively. Something that's hard for me to grapple with is that not everyone is programmed that way or has a desire to kind of reach for that. How do you handle those people? I mean that in a good way. Thinking about someone you really care about like your parents or your spouse or best friend and they're not wired the same way. How do you interact with them?*

First of all, Shane just said, you should tell the Erik Seidel story, so I will. One of the best moments of my life was saying to Erik Seidel, "I can't believe how unlucky I got on a hand." He literally went, "I don't care. Why are you wasting my time with this?" I was like, but I really respect Erik Seidel, I'd like him to talk to me. Let me figure out what the rules are here. That was really helpful.

Obviously, you want to understand, is this someone who is really okay with ... I make the joke about like I'm talking to somebody and they're like, "The last 10 people I dated were total assholes." My desire is always, well, do you think you're picking assholes? Only some people I get to say that to and something people I don't. Let's divide them into the two types of people. There are some people I can be like, oh come on. That's obviously something about your choices, you're choosing these people. What are you getting out of it?

She's pointing at me, right?

But there's other people you can't be so direct with. What do you do with other people who you can't be so direct with? Number one, just understand that there's all types of people in the world and you don't really have control over other people so let that go and try not to let them bother you unless they have like a super direct effect on your life and then it's a little bit annoying, but now the goal is let me move them. Let me try to get them 2% better because it's gonna be much better for me and my mental health. I can be like, that's so awful that you've dated all these jerks.

This feels a little close to home here.

Obviously, you're gonna go on more dates. What do you think you could do in the future to try to stop that from happening. Notice, you're not defensive now because I haven't said anything about the past behavior. I haven't said that any of that behavior is your fault. I haven't said any of that. I'm asking about what's the future look like for you. How do you think you might get there? I agree with you, yes, that's terrible. That must be so annoying, I can't believe all these people are so mean to you. Now, when you're going on your next date, what do you think you might do? Obviously, in order for anybody to answer that question, they have to go back and think about what their choices were with the other people. But I didn't make them do that.

It doesn't feel like I'm accusing you of anything. It's gonna allow you to get to a more rational answer. Where now I can have the kind of conversation I would prefer to have, it's just not quite as direct. I'm getting you there through the side door.

That strategy number one is when people are talking about past decisions in a way that is really irrational, refocus them on future decisions. That's a great trick, that's number one.

Number two is when I speak in uncertainties to somebody, I'm inviting them into a conversation and I'm telling them it's okay to not speak in certainties back to me. If I say, I read this article and it's amazing and it's completely right, will you read it, I don't leave any room for you to have really a different opinion. But if I say, I read this article and I'm not sure about it, will you read it? I now open it up for you to be my information partner. If I say, I'm deciding between these decisions and I'm pretty sure that decision A is 60%, that's also a way to ask for help because I'm telling you there's room for you to give me information, to give me the things you know.

Here's the problem, if I say this is what I'm gonna do and I'm sure it's gonna work out, if you have information that would be valuable to me, the only way that I can get that information is if you're willing to disagree with me because I've told you I'm 100%. Anything that you offer me is now gonna be viewed as disagreement, certainly by you, maybe not by me, but if I talk that way, probably. But when I say, I'm 60% sure this is the right choice and it's really better than all other choices, if you have valuable information, now you give it to me because it's not longer disagreement anymore because I've told you, hey I need help, I'm only 60%.

What's beautiful about that again, if we think about it, there's stuff we know and stuff we don't know. But some of the stuff we know is living in Shane's head. I want to figure out how can I act even if you're not in on the joke. How can I act in a way where I can extract some of that valuable stuff from Shane's head even if he's not in on the joke? If I communicate in these ways of saying I'm not sure or this is the only article I read or I'm 60% on this option or whatever, you're gonna be much more willing to start transferring some of that stuff you know that I don't know over to me in a way that it's gonna be a pleasant interchange because it's not gonna be disagreement anymore. You've taken it out of the world of the disagreement. Then sometimes honestly, you're gonna be like that's just the way they are and that's okay because there's all sorts of folks.

Last question. This is the last question.

Audience: *Hello. I think that this is often a lot more complicated than you're making it here.*

Did I make it uncomplicated?

Audience: *It's not often individuals making individual decisions. I had a scenario a couple of years ago where I had to pick choice A and you get a 70% shot of making 30 million bucks but a 30% of going bankrupt or choice B, you can a million bucks 95% basically status quo and then 5% bankrupt. For me, objectively, the decision is go for the 30 million bucks statistically every time, it's a much better outcome. But there's also 40 or 50 people who are in my circle who are also affected by that who have wildly different both risk and reward within all of that. At the time, I made the choice essentially not to consult with those people within my sphere to say this is the choice I'm making and this is why because I knew that for them the risk reward thing wasn't the same.*

They were a group of people that had to trust me that I couldn't trust in return. As it turned out, it didn't work out, and the thing I got fileted for the most was that I wasn't transparent when we were making that decision. I don't know how you reduce the cost of failure. I don't know how you weigh that up within groups where there is no benefit or maybe there is very little benefit to some of that transparency. How do you create some of that? How do you make those decisions in groups where there's wildly different risk and reward even objectively?

I apologize if I made any of this sound simple, I didn't think I was, but thank you. Yes, there are group dynamics. Let me walk through a few of the group dynamics. Group dynamic number one is that very often within groups, we talk a lot of process but we don't actually mean it. I think Sam Hinkie is a good example of that. That's because of a natural tendency that we have. Let me just ask you guys another thought experiment. Let's say that we're in a real estate investing group and we decide that we're gonna invest, you know obviously we have limited capital, we're gonna invest some capital in a particular property and we have a model of the market that tells us what we think that appraisal is gonna come in at and the appraisal comes in 10% low. This is a little bit your problem, right?

Obviously, we're all in a room. What the hell happened? Why did this come in so low? Why did we deploy our capital so poorly? What's wrong with our model? How could we have avoided this? This is all so awful. It's a big pants on fire meeting. But now let's say that we're in a real estate investor group and we have our limited capital that we deploy and we deploy it to invest in a particular property and we have a particular model of the market and the appraisal comes in 10% higher than we expect. Are we having a pants on fire meeting?

Audience: *Of course not.*

Are we having a meeting?

Audience: *Champagne.*

Champagne. Yes, we're having a champagne meeting. Here's the issue and this speaks to you a little bit, I'm gonna start to get there. Here's the issue is that either one is really bad. Under deployment and over deployment of capital are equally bad problems and particularly on the high side, generally if something comes in much higher than expected, one of the very common explanations for that is there was risk in that, that you did not recognize, so that's bad, right? What we want to do first of all, is think about how can we think about outcomes equally as we're in the room when it's good and we're in the room when it's bad.

The reason why I'm speaking to you about this is that's something that you can do as you're working with a lot of stakeholders that when things come in too high, you can give them a communication, and you can say hey, here's what my prediction was, this came in 10% too high. I went and looked at it and here are my learnings. Those learnings can be a variety of things. My model was pretty good but this was a tail event, which would be included. I actually underestimated the risk in this decision and so now I'm adjusting the model. Or I actually was off on what the market could bear. The shape of my distribution was right but the mean actually should have been shifted over to the right and I learned that. Now, that's gonna be great and I'm gonna deploy better capital.

That's setting up your ability now to be more likely that they're gonna trust these decisions because you're communicating with them when it's on the downside and you're communicating with them when it's on the upside. If you're on a team, you can do this too, particularly if you're in a leadership position.

When things are way to the good, that's triggering a meeting just as much as things are way to the bad. Now, what happens is that people understand that what you care about is the forecast and not the outcome, that that's the thing that you're focused on.

Number two is to now do that analysis up, down and orthogonal so when things are poor, you should say but, here's a case for why I should've lost more, here's a case for why I should've lost less, here's a case for the reason that I invested was at all why, I didn't even have the model right. But then also on the winning side, here's a case for why I should've actually won more, here's a case for why I should've actually won less, here's a case for why I shouldn't have been invested in this at all because it turns out the reason I won had nothing to do with the reasons I thought I would win. Think about how powerful that kind of communication to the people around you are. It's starts to move them in your direction of we don't care so much about outcomes. We actually do care about process.

The third piece is to actually communicate with people about the decisions they don't make or you don't make. I like to broadly think about things in near misses, clear misses, and hits. Let's say that I'm a VC, I've got the things I invest in, we're obviously tracking those. Most people will create a shadow book of some sort out of their near misses. I think everybody should be doing that in order to see what those close calls are. But what people are never tracking is the clear misses and that's where you see the paradigm shifts or the places where you think your model is wrong. Whatever your resources can bear, track the decisions that seem to be clearly no, that just get shoved off to the side, and now also communicate about those things. That's training the people that are stakeholders in order to start thinking this way a little bit more.

Number two is don't be afraid of showing them your process and walking through it because ultimately you are the decision maker. Are there always gonna be people who say I told you so? Of course there are, but there will be fewer. Instead of saying, this is the decision I really want to make and I'm kind of afraid of showing them my process and why I think that because I think they might disagree with me, always err on the side of transparency. You're probably gonna make that decision anyway, but you're gonna have people who can see what it is. They're then gonna be able to give input. It's really good if you incorporate that input.

Instead of saying it's 30 or zero, maybe they give input and you say it's 29 or zero. Now, they become part of that process even though the general contours of the decision are gonna look the same, they have input and buy in. Erring on the side of transparency is really good. Last thing, either that or trade alone. That's what I would say to you.

Audience: *The interest is anxiety.*

The last thing is that we talk a lot in the news today about how tribe is really bad. We've got all these tribal politics, it's so horrible. Life is ending as we know it. One other thing that tribe does for us is it allows us to march up really steep mountains 100 miles when we're really tired because it's to the benefit of the tribe. We can think about it, it allows us to march up some cognitive mountains that are really hard. As much as you can wrap the identity in with the people, like we do things that are really hard and really scary and that's part of why we're gonna do better in the long run. There's other groups and this is what they do, they always take the safe choice but that's why in the end they end up blowing up or they don't really get any return and they're not thinking about this the same way of when do you take a chance, when don't you?

These are really hard because we can all imagine when it doesn't work out that it's gonna be really painful. But we're the people who imagine that in advance and we're willing to take this cognitive risk because that's what it is to be part of this tribe. Think about how much you can be communicating with the people around you using the language of identity around saying, we're willing to be wrong around here. We don't react in the same way as other people, we're willing to be challenged, we're willing to be told why we're wrong, we're willing to take these risks that are really scary, and that becomes the definition of why we're together in this. That's another way to help it along.

Wow, that was absolutely amazing. Thank you so much, Annie.

Thank you. Thank you.

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