Rationally Speaking #208: Annie Duke on "Thinking in bets"

Julia Galef: Welcome to Rationally Speaking, the podcast where we explore the borderlands between reason and nonsense. I'm your host, Julia Galef, and I'm here with today's guest, Annie Duke.

Annie is a former professional poker player and is now the author of the book Thinking in Bets: Making Smarter Decisions when You Don't Have All the Facts. She's also the co-founder of How I Decide which is an organization that helps train kids, mostly teenagers, in rationality and critical thinking in their own lives.

Today we're going to be talking about how to think in bets and why it's important even outside of the poker domain. Annie, welcome to Rationally Speaking. It's great to have you.

Annie Duke: Well thank you. It's super great to be here. I'm a big fan. I'm having a fangirl moment.

Julia Galef: Me too! Tell us in your own words, what does it mean to think in bets?

Annie Duke: Thinking in bets, really the short story is it's about embracing uncertainty. What we can think about is any decision that we make is really a bet that's informed by our beliefs about what the future might look like, and we can't really ever guarantee that one particular future might occur but rather that all we can do is imagine a set of possible futures. So there could be a set of possible futures can result from the decision that we make, and each of those decisions has some probability of occurring. And none of those futures is a guarantee.

So when we make a decision we have limited resources that we can invest — like for example our time or our money — and so we're betting that the decision we make, the course that we set ourselves on, is going to result, in a probabilistic fashion, in some positive return on whatever we've invested. More so than any other possible future that we might choose.

So in that sense, any decision we make is a bet and in order to bet well we have to acknowledge and embrace and incorporate the uncertainty into those decisions.

Julia Galef: This is something that feels very intuitive when you are at a poker table, right? Because the uncertainty of it all is just very explicit when you're playing cards.

But do you find that people disagree with — either intuitively, or just outright reject — the idea that there's uncertainty involved in their decision making in the messy real world? The non-poker real world?

Annie Duke: Let me divide that into two issues.

Issue number one is this idea that we're betting, and definitely there's pushback against that. What people think of as betting is what you describe at a poker table like, "I'm betting against you, and you win, I lose or I win, you lose." Or we go into a casino and we bet against the house. Or they think about betting as having to do specifically with money, for example, and so the return on investment would be counted as money.

But we really need to think about betting in the broader sense that it's really an investment of resources. And this I think generally will create a little bit of an aha moment for people who are trying to get their head around the idea that a decision is a bet, is when I point out to them that there's all different sorts of versions of you that can result from different decisions that you make.

I try to talk about something as simple as, if I'm in a restaurant and I'm trying to choose between the chicken and the fish — although I'm a vegan, so that would be an odd choice for me... but the fake chicken and the fake fish — if I'm trying to choose between the chicken and the fish, there's the Annie that's eating the chicken in the future and the Annie that's eating the fish in the future, and I can only choose one or the other. And so if I do choose the chicken I'm basically betting against myself. I mean the fish-eating Annie, is what I'm betting against.

So most of the bets that we make are actually bets against ourselves and so when you've had that experience of something not working out, like the chicken's really dry and you think, "Ah, I should have known," it's really the fish version of you saying, "You should've chosen me."

Once I say that to people they can sort of wrap their head around this idea that there's uncertainty in the future and there's different futures that can occur, and yes, things aren't guaranteed when you put it in those kinds of simple terms. So in really trying to get people to recognize betting as a construct for understanding decisions when you get into those very simple examples like well, what about when you have to order something in a restaurant? Then they can get there.

Where I think that people get tripped up, where I think that people have a harder time, is when you take it out of the abstract and they're having to make decisions for themselves. Or they have to work in reverse, and they've had some sort of outcome where they're trying to figure out whether the decision was a good one or a bad one. That's where people get really uncomfortable with uncertainty and they don't really want to acknowledge it.

Julia Galef: What does that look like? Not wanting to acknowledge uncertainty?

Annie Duke: Well, if you think prospectively, I think that very often people want to be able to guarantee a guaranteed result. So they'll either advertise a guaranteed result or they'll convince themselves that they know how something's going to turn out. That they know that something is best, or when they're expressing their beliefs they express them with 100% certainty, so they'll express a belief and if you express a different belief for example they'll just say, "I know you're wrong."

Julia Galef:

Yeah, I've always wondered how much of that is them really believing deep down that there's 100% chance they're right, versus, they've learned that that's how you communicate. That when you're confident you just say you're certain, and they're not actually thinking very hard about the odds at all. Just... the way they express the inner state, "I am confident," is by saying, "This is definitely true." Do you have any intuition about which of those is going on?

Annie Duke:

I think it's both. As with many things I think it's both. I think that we are taught that confidence is certainty, is expressing things with certainty.

I actually think that you convey much more confidence by expressing your uncertainty. I think that it signals much more thoughtfulness. So if I say to you, "I think that this is the right decision against all other decisions because I think this one will work out 60% of the time as opposed to the other decisions, but I have some uncertainty around that," then I clearly am a thoughtful person. If I even just say, "I think that Citizen Kane won best picture but I'm 60% on it," I think that that takes a lot more confidence to express in that way.

So I think we do conflate in terms of a communication strategy confidence with certainty.

That being said, I think that internally in our internal worlds we do think of things as much more certain than they are, and I think that's because many of our beliefs are wrapped into our identity. And part of what we're looking for in terms of affirmation of our identity is that the way that we think about the world and the way we process information is really driven to protect our identity. And things like our political beliefs for example, or things we believe about science or the world or our partners or how we raise our children or what kind of cars are good or not good to buy, get wrapped up into our identity.

And if we don't believe the things that we believe with certainty then we kind of feel like that's an attack on our identity. And the way that you can see that really express itself is that people, when they hear information that disagrees with them, generally aren't very open minded to it. So if you actually operated in the world where externally you were expressing things with certainty but internally you were like, "You know, I have to think about what my confidence interval is," or, "How often I think that this belief is actually going to turn out to be true, but I imagine I don't have all the information that I need in order to be certain about it, so this belief is uncertain" ... then when we were confronted with information that was new, that maybe disagreed with the belief that we have, we would be much more likely to be incorporating it and calibrating that belief. But we don't do that. We reject it, because it's wrong.

Julia Galef:

Yeah, it will be no surprise to my listeners to hear that I agree with you that people are too inclined to reject, or involuntarily dismiss, or ignore information that contradicts their preconceptions, or what they would like to be true.

But I do think that it's hard to tease apart the different mechanisms by which that might be occurring. I think there's good evidence that identity is part of it,

but I suspect that there are also other things going on. Like, I don't know, signaling confidence might be a good, evolved strategy, for looking good to your peers or something. Almost irrespective of the content of the answers.

Which to me comports better with the data that people are overconfident even about trivia questions that it's almost absurd to think that they would have identity invested in, like "Was Citizen Kane the winner of Best Picture?"

We're still overconfident about those things too. Which suggests either that our brains are just oversimplifying the world, maybe because it's easier to think about the world that way — or that being confident in anything is a good social strategy, or something like that.

And those two could go along with the identity based explanation, but one might be more prominent in different contexts than the others. Does that make sense?

Annie Duke: Yeah. I actually really, really deeply agree with you. I think that there's the issue of what are we signaling to the world, and then also what are we signaling to ourselves? Because I think that you can imagine that there's all these pressures say from an evolutionary standpoint to project confidence and certainty to the world. Actually there's some evidence that suggests that we upgrade our mate when we do that.

Julia Galef: That we increase the status of our mate, or that we increase our ability to attract a high quality mate?

Annie Duke: Yeah, exactly. We improve our chances in the DNA pool when we appear confident, and that evidence shows that because people are pretty good at spotting deception that we ... Sort of that self-delusion. Like not only projecting confidence but actually believing that we're right is the way toward getting a better mate.

Julia Galef: This connects interestingly to a point that you just made five minutes ago, about how we should be able to separate confidence in our beliefs from social confidence, from appearing confident to other people. That we should be able to signal competence, and appear confident, without having to be 100% certain in what we're saying.

This was something you talked about in your book Thinking in Bets as well, and it was one of the areas where I wanted to push back a little. Because it seems to me that it sure would be nice if we lived in a world in which expressing epistemic uncertainty caused people to view you more positively, and I do think that that's the case in some contexts… but it certainly doesn't seem to be always true. It seems like there are some contexts in which, if all you cared about was impressing other people, or persuading other people, it would be to your advantage to express 100% certainty.

	What do you think about that? Were you simplifying in the book, or did I just assume that you were simplifying… ?
Annie Duke:	I'm a big believer in "have your cake and eat it too," but I also am pragmatic. So I understand that if somebody's job is to be a pundit on cable news, that making declarations probably going to work better for them, because they're feeding people's need for certainty then.

I'm not sure if that's so much about them wanting to come off as confident so much as people's desire is to be told something for certain, so I think those are two separate things and I think they need to be teased apart. I think that a lot of what commentators are providing is, let's say, epistemic closure for people — |
| Julia Galef: | Giving a simple answer, that they don't have to fret over and mull over. It's just clear what the answer is? |
| Annie Duke: | Right. Exactly, and I do think that that's a different issue that we need to parse those two things apart. Like, how are you feeding people's need for certainty, for epistemic closure, for being told what's right and wrong?

Which people really want. It's a lot of what we know that tribes provide. When we think about why do we have all this tribalism, one of the things is that the tribe tells you what is true and what isn't.

And separate that from, can you express uncertainty and still appear confident? And I'm a big believer that you can do that. That's different than whether people are looking for a simple answer or not. So I do think that people are looking for a simple answer, but I do also feel that you can appear quite confident and still express a lot of uncertainty. I have seen some politicians be able to pull that off. Nate Silver, I think. |
Julia Galef:	I was going to ask if you can name any examples of politicians who you think pull this off? I have my own thoughts on this.
Annie Duke:	Who can pull off being able to express things with uncertainty and still appear confident?
Julia Galef:	Yeah, social confidence plus epistemic uncertainty.
Annie Duke:	I can actually give you examples from really both sides of the aisle. I think if you looked at the rhetoric of somebody like for example Eisenhower, I think that probably coming from the fact that he was a strategic thinker because he was a general, I think that he was pretty good at balancing those two things.
Julia Galef:	Cool. I'm not familiar with his communication style but that sounds plausible.
Annie Duke:	Yeah. I think that Obama did a pretty good job.

Julia Galef: He was my example. And for those listeners wondering out there, I do have examples of Republicans doing epistemically virtuous things too! But Obama was the first example that came to mind of someone who was explicit about probabilities.

Annie Duke: Obama was recent, so he immediately comes to mind. But I think that he was someone who did express uncertainty. Not in the sense of just like, "I don't know. I'm just winging it." Because that's different. But in the sense of saying, "Well, different things could result and we've really thought about this."

And even in the description of, "Should they go and raid the compound and try to kill Osama Bin Laden?" I think there's been beautiful descriptions of the kind of discussion that happened in that room, which was all around scenario planning, and what are the likely outcomes, and what's the probability that he's even in the compound? What are the different things that could result from this? And I think that that was conveyed pretty well. And I think that Obama comes off as quite confident so I think that he's a pretty good example.

But yes, I think there are definitely Republicans who also absolutely ... I don't think it's a Democrat or Republican thing. I think that there are Democrats and Republicans who are able to express this kind of uncertainty very well. I actually think G. W. Bush was another person like that. He also came from a more strategic background.

And I think there are examples on both sides of the aisle from Democrats and Republicans who were, let's say, feeding the certainty beast, and making declarations and guarantees and all sorts of things. So I think that those two things need to be teased apart.

I would say that I do believe that if you are expressing uncertainty in a way that signals real thoughtfulness about the process, and you're confident in your assessment of the uncertainty… you can be confident in your assessment of the uncertainty, and your scenario planning, and "here are the scenarios that I think are going to happen, and here's the probabilities that I'm assigning to those," and you can be very confident in your ability to do that kind of planning… that you come off as much more thoughtful and actually much more believable, in my opinion.

Julia Galef: Yeah, I think you've pointed at a really important piece of it. That kind of meta-confidence, that it's right to make these bets, even if you aren't confident about exactly which way the bet is going to turn out.

And I suspect another important piece is: it's true that people like certainty, but I think it's also just the case that everything seems simpler from the outside. And if you're not an expert in something you might just assume that things are simpler than the experts believe them to be.

And so part of being persuasive and appearing confident to other people while still expressing uncertainty is making it clear to people how complicated the

thing really is. So that they don't think less of you for not being certain. Does that make sense?

Annie Duke:

Yeah. It's interesting that when you said that, immediately Dunning–Kruger came to mind. That feels very in the same zone. That when you don't have a lot of expertise in the area that the decision is being made around, it probably appears much more simple than it actually is and it doesn't feel like there's as many dimensions or hidden information or luck involved.

I've actually been thinking a lot about this issue lately, which is: The difference between when you have some kind of decision where the factors are much more opaque, where the influence of luck is less well-known… your ability to gather information is harder. Being able to see inside the decision in order to do a clear analysis is just harder.

And what ends up happening I think is that the appearance of bias, this sort of connection between when the outcome is bad, that's what tells you whether the decision was bad or not — which in the book I call "resulting," also "outcome bias" would be another term for it — and when the result is good, that clearly the outcome is good… that a lot of this, what you were talking about, this opacity, is part of the problem.

So I've been thinking about that in terms of the difference between consensus decisions versus decisions where there isn't so much consensus around them. So the sort of thought experiment that I've been doing lately, which I think relates to what you're talking about, is:

You're going to the movies with your partner. And you have a time that you need to be there, say 7:00 PM. And you take the usual route, and there's a lot of traffic, or maybe there's an accident on the route that causes you to be late for the movie.

And I think that if we do that thought experiment we think about what does the interaction between the two people in the car look like? It's sort of trying to comfort each other. "Well this wasn't our fault." Obviously you've had a bad outcome, but because you're taking the usual route, there's consensus around that decision. We've all agreed that this was a reasonable decision that you took this route.

But if I announced to my partner, "You know what? I know a shortcut. Let's take a shortcut to the movies," and the exact same thing happens — there happens to be a lot of traffic, or there's an accident — I'm pretty sure that we walk into that movie theater in a huge fight.

Julia Galef:

I'm trying to think if that could be reasonable of your partner to resent your choice. I suppose in theory, the normal route, you have more data suggesting that it is a fluke that there's traffic this time. Whereas if you don't have a lot of data on the shortcut then it might be more likely that you actually did make a bad call, as opposed to getting unlucky.

... That's my best attempt to steel man your hypothetical partner's anger at you in this hypothetical situation!

Annie Duke:
I think that for sure that's what it feels like. I've been thinking about this in terms of, like, if I run a red light and I get through the light fine, nobody thinks that was a good decision. But there's a lot of consensus around that decision.

And as you know, I open my book with this Pete Carroll example, where they're on the one yard line and the New England Patriots... It's the last play of the Super Bowl. It's second down. They're down by four, and Pete Carroll chooses a very unexpected play. He chooses to pass the ball. The ball is intercepted — which by the way only happens about 1% of the time — and the next day every headline was, "This is the worst call either in Super Bowl history," or football history. It depended on which one you read.

And it was about something that was going to occur 1% of the time.

But I've been thinking about the fact that there isn't consensus around that decision. It's kind of like your situation where people look at it and they think that it's much simpler than it is, because they don't have the information they need in order to understand what that decision tree would've looked like. So they then look at that and now they're willing to do the shortcut of "Well, it was a really bad outcome so therefore it must have been a bad decision."

But there was a consensus play there, which would be to hand the ball off to the running back Marshawn Lynch. And I've been thinking about that lately because I've been doing this other thought experiment, "Well, it'd be interesting because if he handed it off to Marshawn Lynch and failed to score, there would have been a collective shoulder shrug about it."

Julia Galef:
Right. There's this great quote that I'm trying to look up as I talk... I'm stalling... It's from the economist John Maynard Keynes... Ah, great. I got it. He says, "A sound banker, alas, is not one who foresees danger and avoids it, but one who, when he is ruined, is ruined in a conventional and orthodox way along with his fellows so that no one can really blame him."

That's an unfortunate misalignment of incentives right there.

Annie Duke:
That is perfect. That is exactly right.

And what's interesting is that now I get to come back against your steel man argument of the route problem, which is: We know the math of the Pete Carroll decision. And I highly recommend if people are interested that they go read Benjamin Morris on FiveThirtyEight to see what the mathematics look like. But we know that the mathematics are better in the second case when you actually go in and do the analysis. By a lot, by the way.

And so we already know that, but I think it has to do with whether the decision ... The decision may be opaque to the public in both cases. It's just that in one

case there's consensus around it already, to your point about the banker. You'd be failing in a completely usual fashion. So that then, people are more willing to allow for the influence of luck in the way that it turns out.

Julia Galef:
I want to make sure that we talk about this benefit of thinking in bets, because I've been thinking about this in my own way a lot, even before reading your book... and one thing that I notice it does for me, when I can explicitly make the distinction between a failure that was the result of a poor decision on my part, versus a failure that was the result of a good decision plus bad luck, is that it kind of frees me up to take good bets. Because I know that if the bet turns out badly I don't have to feel bad about myself for having taken that bet.

And I think that anticipating, "Oh god, I'll feel so bad if this turns out badly," is actually ... My intuition is that that's a major impediment to people taking good bets.

So just to give an example of my own, I was on a New Jersey Transit train a couple years ago and it was winter. It was really cold. There was snow and ice on the ground. And I noticed outside on the tracks what seemed to be a fire on the tracks. And I was like, "...That seems alarming. That's bad, right? A fire on the tracks?"

But no one was reacting. And I thought, "You know, it's probably nothing, but why don't I go just find the conductor and tell him about it just in case it is something?" So I found the conductor. I told him. He was like, "Oh yeah, that's fine. That's how we de-ice the tracks. We use these controlled flames. That's normal." And I was like, "Oh, I'm glad to hear that."

I think there's a temptation, in situations like that, to feel like, "Oh, I overreacted for nothing. Now I feel foolish." And I think this is also a reason why we see the bystander effect, when people don't intervene in what eventually turns out to have been a really threatening situation. They're just like, "Oh, it's probably nothing," because they'll feel foolish if it turns it's nothing and they overreacted.

But if you're thinking in bets, then they way you view that situation is: Sure, 90% of the time it's going to be nothing. But in the 10% of the time when it's something, the goodness of those situations completely cancels out the mild badness of having taken these precautions for nothing. And so even when I turn out to be in the 90% world I can still feel good about the fact that it was a good bet to take, and I don't have to feel foolish.

And knowing that I'm going to feel fine, even if I'm in the 90% where it's nothing, helps me take those bets. Which I think is good.

Annie Duke:
Couldn't agree more. One of the things that I've actually been thinking about recently, because obviously in my book I talk a lot about this "resulting" problem, which is bad outcomes, bad decision; good outcomes, good decision...

I think about that as sort of a retrospective problem. Like, what do you do? You have certain things happen in your life. All you have to learn from is the experiences that you accumulate over time. And how do you take these experiences and actually try to go back and derive what the decision quality was? And this is actually a really big problem.

So I'm thinking about it retrospectively, but then, exactly to the point that you just said, I've actually been starting to really think about it prospectively. Which is: if you know that resulting occurs, if you know that there's outcome bias in the world and that you are probably going to be judged more by your outcomes than by your process, it can drive you into a very defensive stance in your decision making.

Think about defensive driving. Now you have defensive decision-making, where what you're really doing is making decisions in a way such that you can create a reasonable story around luck being the reason for a bad outcome.

There's all sorts of ways that that can happen. One would be for example, you not getting up and actually doing something because you're worried about well, if it doesn't work out and nobody else is doing anything... There seems to be a consensus in the car, sort of, through social proof.

Julia Galef: Right. Right, exactly.

Annie Duke: Right, that you don't need to do anything.

Julia Galef: I'm doing the weird thing.

Annie Duke: Right, so you're doing the weird thing. Like, you're taking the shortcut to the movies. Or you're throwing the ball instead of handing it off. And so if there's a bad outcome you feel like, "Oh, I'll be blamed for that, because that was a real decision I made. But if I just sit and it turns out it's a problem, well then that's just bad luck, because I was just going along with what the consensus was there."

So that allows luck to be more of an explanation in the way that things turn out. Another way that we can do that... I'll just give you a second way. There's a whole bunch of ways.

This is something I've really been deep in thought about lately, is using data. I think that a lot of times when we're looking at data, we think about data as something that exists sort of objectively out in the world, but of course we know that that's not so. It takes people to collect it. The types of questions that they're asking as they collect it really matter. Who they're asking, what their sampling methods are, what datasets they're pulling from, what kind of analyses they're running on it, what kind of interpretations.

I think that we all know that if you've got some sort of conclusion that you want to get to, that you can go out and you can find data that's going to get you to

that conclusion. And I think that that's actually a way that people tend to very often use data, is as basically a way to shield themselves from bad outcomes happening.

So you go out. You find data to support the thing that you want to do. It isn't truth seeking, but you can do it. Go find the data that supports the thing that you want to do, and now when things don't turn out you could say, "But the data. What could I do? The data supported my conclusion."

So that would be using data in a very defensive way, and I think that there's lots and lots and lots of examples of people doing that.

There's just all sorts of ways that you might do this. Going with the consensus decision. The status quo choice. Using data to do this. And I think it's a really huge problem in the way that we make decisions is that we really don't want to feel the repercussions of bad outcomes. We don't want to feel the blame for that. We don't want to feel like it's our fault, that this occurred through some action of ours.

Because once we feel like we "should've known," and whatever decision we made clearly, inevitably, was going to lead to this bad outcome, that's going to feel horrible. So how do we make it so that luck becomes a reasonable explanation in advance for the bad outcome that occurs? And that's how you can get into this really defensive stance in terms of your decision making.

But to your point, when you're thinking in bets, what are you doing? Well, prospectively you're thinking: Here's this particular decision, and I cannot guarantee the way the future is going to turn out, because there's luck and hidden information, so I'm going to think about what the set of possible futures are, and some of those futures are undesirable. Some of them are unfavorable.

And balancing that out, and baking that into the decision in advance. So that now when the bad outcome occurs, I don't feel so bad about it, because this was in my thought process. This was included in a very explicit way, before I made the decision in the first place.

Julia Galef:	Like, "I knew these cards were in the deck and I would make this same bet in the future." If you can get into the state where you can feel like, "I would make the same decision in the future given the same information," then I think it's easier to feel good about the decision even though the outcome was bad.
Annie Duke:	You know, what you just said reminded me of something which I'm just now relating to this… This tendency for second guessing upon a bad outcome is so strong that even in a game like poker, where the fact that you can't control the cards that are yet to come seems to be obvious and agreed upon —
Julia Galef:	Right. You'd think that would be the pure case!

Annie Duke:	That this would be the pure case. When I was still playing I would sometimes have people come up to me, and they'd want to be asking me a question, and it would be something like, "I had aces —" Now, understand. Aces is literally the very best two cards that you can get dealt. There is no better hand than this... And they'll say, "I had aces. I raised. Somebody else put all of their chips in. I had to then call all of my chips," so obviously the whole shebang is at risk here, because if they lose the hand they lose all of their chips.

But they have the mathematically best hand in poker. This is a no-brainer. Of course you call.

So they would come up to me and they would say, "So I had aces and someone else put all their chips in and then I put all my chips in," and then there would be all sorts of words that would result in, "... And I lost the hand." And then they would say to me, "So, do you think I should have folded the hand in the first place?"

And this is an absurd question. |
Julia Galef:	It must be so stressful to have that kind of mindset though. To feel angst even when it's *provably true* that you made the right decision — which it usually even isn't, but even when it is provably true, to still feel angst...
Annie Duke:	Well I think that this shows ... I describe results as creating a gravity well. When we think about what happens when you're in a gravity well, you can't see out of it to what's up at the rim. And once an outcome is known, it acts like a gravity well. It pulls us down into the bottom of that where we can't see out into the decision quality anymore.
Julia Galef:	Meaning that we lose the ability to imagine what it was like to be before you knew the results, and just had the information available to you at the time? We can no longer simulate that, because we now have the information, so we can't block it out of our mind?
Annie Duke:	Exactly. Another way that I describe that is it casts such a strong cognitive shadow over our ability to think.

And so I hear people talk about, "We're results oriented. We're all about results at this company," or, "I'm all about results." And I'm like, "No. No, that's a bad thing to do," because you're going to create all of this defensive decision making. Because, trust me, people are going to be defending themselves against your results-oriented strategy.

And so people will say to me, "What am I supposed to do about this though? What am I supposed to do?" Because again, the gravity well is so strong. And I say, "Well, the counterintuitive thing. What's involved in thinking in bets — if we think prospectively about thinking in bets that what we're trying to do is imagine all the possible futures, not guarantee a particular future." |

So we're sort of thinking about it in relation to a whole bunch of different outcomes, but not a particular one. It's to try to get yourself back into that space where all the possible futures are still possible. Because once a particular result has occurred it's like all the other possible futures that could occur, they kind of get pared. They get chainsawed off of the tree. You forget about them. You can't see them anymore. They're hidden from view.

So I always say, here's the three things that I would love if people did when they're trying to deconstruct a decision:

If you can, do as much as you can before the result happens. Which isn't always ... I mean, in poker that's certainly not possible.

But if an outcome has already occurred, find three separate groups of people. Completely separate groups of people. With one group, describe the decision that you were struggling with, only up to the point that you had to make the decision and no further. So, don't give them the information about how anything turned out. And talk to them.

Find another group of people where you describe the decision and then you tell them it worked out well. Then find a third group of people and describe the decision and then tell them it worked out poorly. Then you can kind of interpolate among all three of those, the advice that you're going to get.

The first thing it's going to show you is that the advice is incredibly different from the three groups. That's number one. Particularly when you look at, what does it look like when you tell somebody the outcome was good versus tell somebody else when the outcome was bad? And I think it's very illustrative. I think it's a really important exercise for people to do in order to be able to start getting down into process as opposed to results.

Julia Galef:

That's great. I just want to try to sum up what we've been talking about for the last 20 minutes about the poor outcomes that result when you don't think in bets:

We've talked about defensive decision making, where you're just trying to avoid the outcome where, yes, you made a good decision but you got unlucky, and now people blame you and you blame yourself. So you distort the quality of your decision making in order to avoid that. That's one unfortunate consequence.

There's also the unfortunate consequence of, I guess we kind of touched on this, taking the wrong lessons away from what happens. So maybe you made the right call — I forget what your example in poker was with the aces, but maybe because that turned out badly, you're going to make the wrong call in the future. So you're actually learning the wrong lessons.

Then there's this third category which we've also been talking about intermittently which is, it makes your life so much more tumultuous and

stressful and angsty, when you have to feel bad about yourself every time you get unlucky. So it seems to me that thinking in bets allows you to ... It smooths out your outcomes basically. It allows you to be more even-keel when you're making decisions, and reacting to them.

Annie Duke: I want to just grasp onto that for a second, which is I think that you live a life of so much more self-incrimination, number one. If you don't think in bets I think that you're looking either to blame yourself or blame somebody else for your outcomes. When we'd all be better off if there was less blame going around, and it doesn't feel good to blame yourself, but it also doesn't feel good, I don't think to blame other people.

Or you live a life where you're just sort of looking for this way for it to be like, "It wasn't my fault. It was out of my control." Which I think is ironic, because I think we'd all like to feel like we have a lot more control over our outcome, and yet because we don't think in bets, because we are defensive of the way that the world happens, and we're so afraid of that feeling that a bad outcome causes us, that we are looking for a way to say, "It's not my fault. The world is just happening to me." I think that it causes you to lose agency in a way that I think is very bad psychologically.

Then the last thing that I would just add to that is I think that you tend to live a life of surprise a lot more. Because if you're not considering what all the possible futures are, I think you're very often surprised by how it turns out. Which, I'm saying it cheekily by saying "surprise," but let's call it — you live a more *reactive* existence. As opposed to planning and having plans in place for the way that things might go so, that you're ready for what might happen.

And you're calmer when you're ready, and you're not being reactive. So I think all around you just end up being calmer. I think you end up blaming other people less, which is nice. You blame yourself less. And I think you take agency.

Julia Galef: Annie, before I let you go I wanted to just tell you — I don't know if you've heard of this pitcher, his name is Trevor Bauer. And as previously established I don't follow sports at all, but he came to my attention because someone shared an article about him in my Twitter feed. And I just think he's a great example of a rare person who really seems to think in bets.

The way that he came to my attention is that there was an article where, I guess his pitching record recently had been unusually good, and so some reporter was interviewing him and asked, "What are you doing right, that you're having so much success?" And most people in that situation would answer, "I've just been really focused lately," or, "All that training paid off," or some causal story. But instead he just shrugged and he was like, "Random variation. It's going to even out in the end."

Annie Duke: Did you tweet about that?

Julia Galef: I might have shared the tweet, yes, and I've looked into him since-

Annie Duke:	I think you did.
Julia Galef:	Sorry, go on.
Annie Duke:	I think you did because the story sounds very familiar and I'm pretty sure that I saw it on your Twitter feed.
Julia Galef:	That wouldn't surprise me, it's the kind of thing I would share!

Julia Galef: But I actually did a little more research on him after that and there have been a couple other cases where there was a negative pattern that he was asked to explain. I think his home run rate was high — which, if you're a pitcher, is bad — and the reporter asked him about that. And he just shrugged, he was like, "Yeah, this is going to even out in the end because my ..." — I think it was, like, his fly ball rate was relatively low so given that, this was better explained as bad luck than bad pitching, or something. Like, the home run per flyball rate is actually not very ... It's very subject to chance and not to the skill of the pitcher. I sure hope I'm getting all these details right, because I'm not into sports.

And he tends to explain his decisions, like when analyzing a game after the fact, he'll talk about how, "This was a bad call for me to let this guy walk," or, "I'm happy with this pitch even though the guy hit a home run." And so he really seems to be analyzing the quality of his pitching decisions and not the outcomes.

And the nice thing about that is that it gives him this even keel, like he doesn't have to feel terrible about strings of bad luck, et cetera. It's kind of a cool example of someone applying thinking in bets to sports. Anyway, I thought you would like that.

Annie Duke:	Yeah, I love that. When I hear examples like that it just makes me really happy-
Julia Galef:	Yeah, me too actually. It made me grin.

Annie Duke: To see somebody who has an audience, who's communicating these kinds of concepts in a way where they're really signaling to people that it's okay to talk this way. That it's all right to not sit there and say, "Well, that wasn't my fault," or when things are going well to be like, "Yes, because I'm really ..." As you said. I feel like in sports so often it's always like, "I'm so focused and my training regimen was so amazing and we did all of this stuff right."

There was just a study done, sadly I can't remember who the researchers were. It's just not coming to top of mind. I think that if you look at Behavioral Scientist online, that's where I saw the study.

But they were looking at when NBA teams lost by a very close amount or won by a very close amount. Like a one-point loss versus a one-point win, where clearly that's just due to random variation. I mean obviously if you lose by one

point or you win by one point, there's probably no difference in the decision making that is substantial at all —

Julia Galef: Yes, and then the coaches change their starters after the one-point loss, right?

Annie Duke: Right, but not after the one-point win.

Julia Galef: Yeah. I thought that was a really cool study.

Annie Duke: Exactly, so let's loop that back to what we started talking about, which is one of the lessons that you nicely explained: as we think about what the problem with this is, it's that it's sort of taking the wrong lessons from our outcomes. That we'll reinforce decisions that maybe shouldn't be reinforced, or we'll reject and change strategies in situations where maybe we shouldn't, because the outcome was actually mainly due to luck.

This is a very good example. A real world example of this happening, where you're not changing your lineup on the one-point win and you are changing your lineup on the one-point loss. And let's agree that that's a really bad lesson to take in either case. There's shouldn't actually be a difference between those two things. You should actually be having a similar reaction to both of those, because they should just be under the category of "close." This was close.

So when I see people who have that kind of audience who are in sports, not saying, "Oh, I was super focused and I just changed my diet," or whatever it might be, and just saying, "You know, eh, a lot of it's just random variation." … It makes me so happy when people are willing to communicate like that.

Julia Galef: All right Annie, last question for you. At the end of each show I like to ask my guests if there's a book or a writer or thinker that they can name who they have substantial disagreements with but whose thinking and/or arguing and/or methods they respect, and think is worth engaging with? Anyone like that you could name?

Annie Duke: It's interesting because I think that there's almost no one that I can think of who I agree with all the time. Most people that I read, I agree with some of the things they say and I disagree with other things that they say. What I really value is, what is your style of argumentation? Are you engaging in what looks like truth-seeking to me?

So I think probably if I had to name one person where I very often have substantial disagreements, but I really, really like reading them because they make me think, and they often make me change my mind, would be David French, I think.

Julia Galef: Can you just say a little bit more about the kinds of things that he writes about? Or the kinds of disagreements that you have with him, or what you admire about his writing? Take your pick.

Annie Duke: He's a writer for the National Review, and I would describe myself as very center, so he's more right than I am. I mean right, politically, than I am.

Julia Galef: That is a confusingly ambiguous word sometimes!

Annie Duke: It is. Yeah, because I'm very center, but I think that when he argues he very often is bringing up arguments that disagree with him. I don't see him straw man very often, which is something that I really appreciate. So I do think that when he's arguing he is arguing against, very often, a very strong version of those who disagree with him.

                 And I think that he's very often pointing out points of agreement with people who he disagrees with, which is something that I like.

Julia Galef: Those are all great signs about a writer or a thinker.

Annie Duke: Exactly, and there are definitely places where I agree with him just kind of naturally, because I'm center. But then he has made me think and sort of change my mind before, about things that I felt very strongly about. And now at least one of the things that he's helped me understand is that I think that it's hard in politics for us to really feel very deeply that when somebody disagrees with us that they can have really the best intentions, and really believe that what they believe should be policy would create the best outcome for people. That they're really trying to do good in the world. And I think that he's someone who shows you that that's true.

Julia Galef: That's great. I guess we'll link to maybe his page on National Review with the list of articles, unless there's a favorite article of his that you want to share with us.

Annie Duke: No, I mean I think if you read him I think most people are going to find that there's lots of stuff that they disagree with and lots of stuff they agree with. The thing that's interesting with him is that I see him get in arguments with people on the right all the time as well.

Julia Galef: That's also always a good sign. I mean, the general form of that, of getting in arguments with people who are on your side on a lot of the object-level issues.

Annie Duke: Yes, exactly. Like not nasty arguments.

Julia Galef: Exactly.

Annie Duke: Yeah. The other thing by the way that I just appreciate about anybody is I don't think I've ever seen him just use an ad hominem, so that's always a good signal for me.

Julia Galef: That is a great signal. There is far too much of that in the world.

Annie Duke: Yes. I would agree.

Julia Galef:
Well Annie, it's been such a pleasure having you on the show and we'll link to your book, *Thinking in Bets: Making Smarter Decisions when You Don't Have All the Facts*, and thank you so much for joining us.

Annie Duke:
All right, well thank you. I really appreciated it, and I'm really happy that we got to have this conversation. This was super fun.

And I just want to say, I love when someone summarizes my work in a way that I wouldn't have necessarily summarized it, but it's actually much better than the summary that I would've done. And you did that today. So I'm always really appreciative of that.

Julia Galef:
Music to my ears. I'm delighted to hear that. Well, thanks again, and this concludes another episode of Rationally Speaking. Join us next time for more explorations on the borderlands between reason and nonsense.