DOPE LABS

Transcript of Lab 037: In Denial

Titi: Hey, y'all!

Zakiya: We are finally back.

Titi: Oh my goodness. It's been too long

Zakiya: Man... So much life has happened

Titi: So much has it's happened

Zakiya: So much science has happened.

Titi: Yes. So much non-science has happened

Zakiya: Come on somebody. And that's why we had to come back.

Titi: I felt like when the world needed us the most, we disappeared like the avatar Aang. It just was not right.

Zakiya: Well, we are finally here to make it right.

Titi: I'm Titi

Zakiya: and I'm Zakiya. And from Spotify, this is Dope Labs.

Titi: Welcome back to semester four of Dope Labs. We have missed you so much.

Zakiya: Let's just jump into it. For the uninitiated Dope Labs is a weekly podcast that mixes hardcore science, pop culture, and a healthy dose of friendship.

Titi: This week, we're talking all about something that's been heavy on our minds and hearts for the last few months, science denial. But before we get into that, we have exciting news that we want to tell you all about.

Zakiya: You thought you couldn't get enough before what we're going to find out.

Titi: More, more, more, more dope labs more Dope Labs more . Y'all ask for it. No more of the bi-weekly stuff we're going to be in your ears every single week.

Zakiya: And that's not the only big change that's happening. Semester four is coming exclusively to Spotify for free starting December 16th. So if you already listened to us on Spotify, keep doing what you're doing, and don't forget to follow Dope Labs and tap that little bell icon so you never miss when a new episode drops. Now after December 16th, you won't be able to hear new episodes of Dope Labs anywhere else. So if you don't listen to us on Spotify yet, be sure that you go ahead and make that change. Spotify is where you can listen to Dope Labs, plus all your other favorite shows for free.

Titi: Alright Z! I hope you are ready! Let's start the show. We're starting off this new semester with a real banger. This week we're talking all about science denial.

Zakiya: This has been a huge topic, especially when it comes to the pandemic, but we've also seen a lot of science denial reports in recent years with other issues to Titi like climate change.

Titi: Absolutely.

Zakiya: We're really passionate about scientific information and combating science denial in general. I mean...

Titi: it's why we started the podcast.

Zakiya: Yes, yes. We want science to be accessible for everybody. And part of that means having good information and the right tools to make decisions, especially when it comes to your health.

Titi: So we really wanted to understand science denial, its history and the motivations behind it. And trust us when we say this issue is not as simple as it might seem.

Zakiya: So let's get into the recitation.

Titi: If you're new to Dope Labs, we typically structure our episodes into three main parts, the recitation, the dissection ,and the conclusion. The recitation is at the beginning of the lab, where we get everybody on the same page and define what we know already and what we want to know by the end of the episode.

Zakiya: Right. And that's followed up by the dissection where we answer those questions in the recitation, where we talk to our guest expert and learn all the information we do our deep dive during this part of the episode.

Titi: And then we get to the conclusion where we put a nice bow on everything. We kind of round up everything that we have learned throughout the rest of the lab and talk about any conclusions that we can make.

Zakiya: All right. So for this episode about science denial, what do we know? Why are we talking about this?

Titi: Well, I feel like science denial is on the tip of everybody's tongue right now because of the virus spreading that shall not be named. No we're in the middle of a pandemic. So this is a new experience, a new shared experience for all of us. And so there's a lot of people who are very confused, who are trying to get up to speed with the science around viruses, virus transmission vaccines, and everything like that. And there's a lot of fear.

Zakiya: Absolutely. I think in addition to all those things you just said and fear, there's a lot of information of varying quality and truth being spread. If you're trying to make some decisions, it's hard to know who or what to believe. And you're just constantly bombarded with information.

Titi: Yeah. And then we also know that science denial is affecting very specific communities more than others.

Zakiya: The other thing I want to know is where do we draw the line from skepticism to denial? Because I feel like a healthy dose of skepticism is good.

Titi: Right. I think that helps you have like, Great conversations, but there's like this really thin line where things start to go left. Another question that I have is, what can we do to check in on ourselves? I'm not coming from a place where I'm on a high horse. How do I check in with myself? How do I check my. If I'm falling victim to that.

Zakiya: I think all of those are really good questions. Let's jump into the dissection.

Titi: Our guests for today are Dr. Gail Sinatra and Dr. Barbara Hofer

Dr. Sinatra: My name's Gail Sinatra and I'm a professor at USC University of Southern California in the Rossier school of education.

Dr. Hofer: And I am Barbara Hofer. I'm recently retired from Middlebury college. So professor emerita and that's in Vermont.

Zakiya: Doctors Hofer and Sinatra published a book earlier this summer called Science Denial, Why it Happens and What To Do About It.

Titi: Their book explores the psychological issues that keep folks from having a broad understanding of science. It also offers solutions for those wondering what they can do to help curb the spread of misinformation.

Zakiya: And when we say we want to know about science denial, what we mean is we want to know why people may flat out deny. Or maybe just a little bit doubt or resist scientific fact or general scientific conclusions. What's keeping them from accepting what's already been proven. It can feel really easy to say "hmm, not me. I'm not a victim of science denial" but it's not just accepting big issues like climate change or understanding that vaccines work. It could also be how you decide to take risks, or if you choose to buckle up in your seatbelt, even though, you know, it can protect you in a crash. I think it's also these smaller nuance things in our day-to-day lives as well. And everyone is susceptible

Titi: All of us, even the people that, you know, have been highly trained in the science field. We can all be a part of that group. And I think that is something that folks have to understand

Zakiya: what I still want to know a little bit more about is that difference between skepticism and stepping all the way over to science denial.

Dr. Hofer: We want people to be skeptical. If you see one study with a small sample and there's some clickbait headline be suspicious, be skeptical. That's the time to question it. If it has not been substantiated, corroborated, supported with additional studies.

Zakiya: Titi you posted something the other day. And I was like, "spot on".

Titi: Oh No, what did I say? I be saying a lot of crazy stuff.

Zakiya: On Twitter, you said "it's been a year and a half or a year and nine months. If you're still doing the research, what kind of research it?"

Titi: Yeah, I just feel like people are still saying "I'm doing my research on coronavirus". I'm like, hello?

Zakiya: Yeah.

Titi: You not doing research. You are kind of just not doing anything and being stuck in your thought process, which I understand this is a big topic to try and swallow.

Zakiya: Yes. Especially if you have to get all the background skills, if you need to understand virology, immunology, molecular biology, vaccine design, sociology, human behavior, risk management.

Titi: That's a big mountain to climb.

Zakiya: Yes. And you know, we've talked about skepticism. We mentioned it a little bit earlier, but I think there's a difference between skepticism of information that, you know, you don't know where the source is. It's just tumbling down your feed versus the Johns Hopkins university, Bloomberg school of public health, telling you that the cases are rising in your area. And you're like, I don't believe what they're saying. That's not just skepticism right there. So how do we identify science denial then?

Dr. Sinatra: You don't see people who are very doubting and resisting science hesitating to use an iPhone or get on a plane. They're not denying physics. They're not denying the technology that goes into wifi. So it is this phenomena of selective denial, which really is driven by your motivations, your emotions. So you're picking and choosing what you like about science and what you don't like. And science doesn't work that way.

Zakiya: That's such a good point. You know.. Science does not care about your feelings. It's not about our opinions or what we want to be true.

Dr. Sinatra: It's about what the evidence suggests is our best understanding of the science at the time.

Titi: Yes, it's so important to remember that science is backed up by research and evidence. For example, with masking and vaccines, scientists are doing studies to see how effective those measures are and then creating guidelines accordingly. And yes, these guidelines can change as the evidence changes, as we learn more. But we'll talk a little bit more about that later.

Zakiya: But I think we should start with the history of science denial, Titi.

Titi: Let's rewind a little bit. Have we seen science denial before in different forms. And how did we get here?

Dr. Sinatra: The history of science probably starts with science denial, doubt, and resistance.

Dr. Hofer: We try to trace it back to Galileo. And you think about how he was under house arrest for the beliefs that he had, how long it took for people to accept his theories. Think about Darwin. It took more than a hundred years for scientists to accept fully what he was proposing in the way of evolution.

Zakiya: So for real, it feels like science denial has been going on since the beginning of science itself. And in the last 50 years it's become more pervasive as there's been some outside meddling. So corporations realizing that fostering some science denial could help their bottom line. It all goes back to the money.

Dr. Hofer: Beginning with the tobacco industry, for example, were interested in trying to deflect the idea that somehow it was cancer causing and they hired PR

firms to sow doubt and the same companies are being used by Exxon and other corporations to make it look as though climate change isn't a certain fact.

Titi: In fact, even as recently as 2010, Phillip Morris has routinely argued that Marlboro gold cigarettes actually decrease the risk of cancer.

Zakiya: That's wild, but that brings us to today with a global pandemic and a steadily warming planet, it feels like people are holding their noses up at scientific evidence left and right. So this has made me ask, is there an increase in science denial?

Dr. Sinatra: I think the difference that we see is the amplification of misinformation through social media. And that's coupled with us living in our information bubbles, where we get the same information. And if it's misinformation that same misinformation reinforced over and over again, and it becomes more credible. There's the joke that misinformation travels around the world before the truth gets up and puts its pants on. Misinformation is really compelling. It's sometimes interesting or intriguing, or even funny to some people. And that gets the clicks. And as we know the way the algorithms are shaped that more clicks gets more attention.

Titi: We've talked about algorithms on social media before. What goes viral isn't always true.

Zakiya: It really helps us understand why it's so important to talk about science denial right now. So when you think about that amplification and what we know about the brain and the more you see something, the more it's reinforced and you begin to believe it. I think all of that makes sense in the current. Sometimes people who are science deniers go overboard and say, I'm just waiting for the science. Well, part of the science is assessing risks early on. And even later in the pandemic was people outright saying no to masks, like it's not going to keep you 100% safe. Well, ma'am, if it's going to keep you 90% safe, I'm going to say. That's still useful. Right. And I think that's the part that we start to see this kind of doubling down on I'm so scientific. I know 90 is less than 100, but I think you also know 90 is higher than zero.

Titi: It's like if you look at the forecast and it says there's a 70% chance of rain, you see that. And then you're like, okay, let me take my umbrella just in case.

Zakiya: Right.

Titi: It Is the same thing

Zakiya: You don't say I'm not going to take my umbrella cause it's not a hundred percent chance of rain.

Titi: Exactly. So why don't you apply that same logic to masks? Hm

Zakiya: Now that we have an understanding of what science denial is. We want to understand what is causing people to flock to science denial. Let's get into the reasons.

Titi: Dr. Sinatra and Dr. Hofer outlined five explanations for science denial, doubt, and resistance. The first is mental shortcuts and cognitive biases.

Zakiya: Second is understanding beliefs on how and what you know.

Titi: The third is motivated reasoning.

Zakiya: Fourth is social identity

Titi: and the fifth is emotions and attitudes and not attitude like Zakiya's attitude, different attitudes,

Zakiya: The first explanations is mental shortcuts and cognitive biases, right? Cognitive biases are kind of these mental gymnastics that we do so that we don't have to run through all the processing every time.

Titi: Yeah, so our brain is learning along the way, you know, A equals Z and you don't have to do A, B, C, D E F G all the way through.

Zakiya: But sometimes these brains can trick us and they learn something early on and they reinforce it over and over again. We're going to talk about that in a later episode, mind over matter, but you know, one type of cognitive bias is known as confirmation bias.

Dr. Hofer: Confirmation biasis this implicit tendency to seek, recall, affirm things that already fit with your existing beliefs. So everybody who's listening can probably think of a time when you Googled something to find an answer. You already thought you knew what the answer was and you quit Googling as soon as you find it. You think, okay, that supports it. But you don't search laterally across to see if it's confirmed or if there's anything that contradicts it. That's confirmation bias.

Titi: I think we all can remember stuff that we saw on the early internet or heard through the grape vine at school.

Zakiya: Do you remember me sharing with you on Twitter, where this guy said that he found shrimp tails and his cinnamon toast crunch, Titi? I was like, Hmm, I don't doubt it because you know, a long time ago I saw this thing that said that like up to 10% or something like that of cereal product could be unknown material. And as soon as I said it to you. I was like Hmm, let me check that.

Titi: Because I was like, I have never heard this. I don't believe that.

Zakiya: And also my today, many years old brain knows that 10% is a lot.

Titi: I've eaten a lot of cereal in my day. I've never seen anything strange

Zakiya: That confirmation bias, you know, I think we've been trained to always look for a countering point, make a liar out of me and make me wrong. That's how my Google searches look. I think the other piece of this, right? So if we think of these mental short cuts, the second arm of this is just how we think about knowing and learning in the first place.

Dr. Hofer: Another chapter that we have is on what psychologists call epistemic cognition. So it's what people believe about knowledge, how they think they know. And one of the issues is epistemic trust. Who do we trust as a source of knowledge. One of the things we talk about in the book are reasons why some people might not trust the medical community.

Zakiya: This feels so relevant, Titi, especially in the face of people deciding whether they trust or don't trust the government and regulating organizations like the FDA. And even when we see these organizations overstepping each other, just

like we see the CDC overruling, the FDA, who is our regulatory agency. And the CDC is saying, yes, everybody should have a booster shot.

Titi: Right. I mean, when you see stuff like that, how do you know who to trust? Because they both are organizations that we look to for the facts.

Zakiya: And especially after seeing such political influence within those organization. It's hard to know, Hey, if it was susceptible then is it susceptible now? Is it still unbiased? You know, it makes it really hard. We see the same thing with people being skeptical of mainstream media or which news stations they go to for their information. And it's concerning because the information is not the same.

Titi: And we talked about this in an article that we wrote for a Scientific American. We know the roots of folks, distrust of the scientific community, the medical community, to be real from forced sterilization to the latest evaluations of disparities and health.

Zakiya: Yeah. I mean, historically bad things have happened to minoritized folks and to poor folks. And now that leads to poor outcomes for those people. It's embedded in the system and it feels like a snowball effect because it's self perpetuating. So you have folks who are going to receive medical treatment and receiving subpar care. That subpar care translates to terrible outcomes. And when they see that terrible care and terrible outcomes, the other people that are on the periphery, you know, family members, children, parents, they then say, I will not trust the medical system. And so they don't go get any type of preventative care or maybe they don't have access to preventative care. And so then they continue to present with medical issues that are at much later stages, and then they get poor care then, or even if they get good care, then they still have poor outcomes. Right?

Titi: Yeah. It's a vicious cycle of things. We even see things like that present day. Cause I know that there are probably some people who think that's old school medicine.

Zakiya: No, sir.

Titi: But when you think about the care that Serena Williams had, when she was giving birth to her child, she almost died. She kept communicating that she was in a lot of pain, but she wasn't being believed. And that is something that studies have

come out that have said there are a large group of doctors who believe that Black people have a higher pain tolerance.

Zakiya: And so they're treated differently.

Titi: Exactly. Treated differently from, from top to bottom. So that means that Black people are less likely to get pain medication.

Zakiya: It's not even that you can earn enough money to move you into a different economic class that protects you. It's about being Black. Even if I go to the best hospital, look at Serena Williams, a world-class athlete.

Titi: The Serena Williams, so many grand slams

Zakiya: All of that.

Titi: And she's still a victim of this.

Zakiya: And so when you consider this right, it makes sense that people would have this mistrust or this hesitancy or resistance to information from the medical community or the scientific community, or even the government.

Dr. Sinatra: We also hear people say, "ask your doctor as" if everyone has a doctor, they can just get on the phone. Do you have access? Do you have a relationship with the doctor? Do you know who you can go ask? Not everyone has that kind of access. Some people have hypothesized that Great Britain has had a larger percentage of people vaccinated because they have a universal healthcare system and everyone knows who their doctors is and everyone knows where they can go and here people don't necessarily know where to go. And they don't necessarily have good access

Titi: Preach Dr. Sinatra.

Zakiya: And that makes all the sense, right. Along with this historic and current difference in treatment for different groups. There's also the matter of access that you overlay. And we've heard a lot of things around vaccines where people were saying, oh, why won't people just get vaccinated? I'm like, Hey, it's a little deeper than rap. You know, it's not just, am I going to go do this thing?

Titi: I think that that's something that scientists scientific communicators and folks in the medical committee need to take into account when we are communicating with folks who are skeptical or deniers, is that it's not coming from a place of misinformation. It's coming from real

Zakiya: lived experience

Titi: A real place, and it should be respected as such.

Titi: And Titi, you hit

Zakiya: the nail on the head saying that science, communicators and organizations need to consider who folks trust. Right. And what their lived experiences may be.

Dr. Sinatra: It's also about trust. So you trust people, you identify. And then you have mistrust for people you don't identify with. So while it's hard for us to understand why somebody would take a livestock dewormer rather than a vaccine..

Titi: That's right. Folks have been taking ivermectin and that's a drug that's typically used as a parasitic dewormer for a livestock

Dr. Sinatra: it's about where they're finding that information. They don't trust the voices that talk about the safety and efficacy of the vaccine. But they are trusting people that there's alternative mechanisms, medications to treat COVID, which has no basis, but they're hearing this information from people they identify with, and that is who they trust.

Titi: So if someone in your community who you trust says something, but there's no supporting scientific evidence. That can still sway people to action or inaction.

Zakiya: We saw that with Nicki Minaj,

Titi: what people grabbed onto and ran with is Nikki didn't take the vaccine and didn't go to the met gala because of it. And then she starts talking about some cousin's friend who has swollen testicles and that kind of misinformation is so dangerous because people won't do their due diligence. They're going to say, I love Nikki. Okay. I love Roman. And they will run with that information. And they'll say, that's all I need to know.

Titi: We have

Dr. Hofer: realized that nobody trusts just one person. We all have multiple people in our worlds that we trust and doctors and pastors, for example, can be very influential in terms of the vaccine.

Zakiya: And this brings us right back to the algorithm problem though, right? Because if the multiple people you trust are all in your bubble, They're all seeing the same shared misinformation, then it feels like everybody you trust is saying don't get vaccinated. The problem then is when people like, I know somebody who didn't get vaccinated, they got COVID and they were really sick and they were in and out of the hospital. But then they wrote this really like cryptic post about maybe you should get a vaccine. I'm not gonna tell you who to believe this and that, but I had this terrible experience. You think they got shared like all their other misinformation. Do you think they came with that same hot fire?

Titi: No.

Zakiya: No. And part of that may be that it wasn't shared because other people have their own, what we call, you know, motivated reasoning behind what they will and won't share or what they will, and won't believe. And doctors, Sinatra and Hofer told us that motivated reasoning is another explanation for science denial.

Dr. Sinatra: Motivated reasoning is that you can either reason towards what we call an accuracy goal. Like another words you want to find out the accurate information, or you can often subconsciously reason towards a desired conclusion. So that comes into play when you are weighing information that you've read online.

Titi: Dr. Sinatra gave us an example of motivated reasoning around stem cell therapies potential to help with Parkinson's disease.

Dr. Sinatra: So perhaps you have a friend who has Parkinson's. And so you read articles about whether stem cell therapy can help with Parkinson's. You may be overly enthusiastic about the potential for this therapy and you may reason that it's great when it may be only okay. Or even not great. Conversely, if you have concerns about the use of stem cells when you question where they come from, and you're wondering if they've been used ethically, and then you look at a stem cell therapy online. You may reason that, oh, this stem cell therapy isn't any good. It

doesn't work at all. So that's a motivated reasoner with your reasoning too positively or too negatively based on wanting the outcome to go towards what you're already believing.

Zakiya: That's a really good point. It almost feels like how you do those googles you know, if you're already deciding something is one way

Titi: when you start typing into Google, Google starts to guess what you want to type. And if Google, which it does, knows like your search history, it's collecting all this data from your emails and all these things like that. It'll probably lead you to the exact place you're looking for the exact answer that you want answered in the exact way that you want it answered to confirm your thoughts.

Zakiya: Another psychological challenge that can lead to science denial is related to our social identity.

Dr. Hofer: We are all tribal people. We all belong to certain groups and we draw our identity from those groups. And when the groups believe certain things, we tend to believe certain things. It's a shorthand for thinking about what to believe without even maybe looking into it in a lot of depth. So if you think about the things that many people believe right now, About, uh, whether, for example, the vaccine causes infertility, which it does not, we know that conclusively, but if people have heard that on Facebook or heard it from their friends or their neighbors or their identity group, they go online. It's not hard to find confirming evidence for that. And just quit. Without looking at the fact that there is no science evidence behind it. And so we have seen some serious tribalism around science denial in ways that shock even us who have been writing and thinking about this for a long time of looking at the degree to which people will think this is what my people believe. This is what I'm going to believe. And we were both dismayed to find that in Missouri last week, there were people wearing disguises when they went to get vaccinations because they didn't want people they knew to see them violating the values that they had upheld that masking was bad and that vaccinations were unnecessary.

Zakiya: You know, this reminds me of, and it goes right back to Missouri, there was this state representative Bill Kid, and he had written this post and he said, no, we didn't get the vaccine. We're Republicans. That's like a social identity thing. Right?

Titi: Yeah. I wonder if there was any other time in the history of this country where. Things are so strongly tied to like a political affiliation. Where you can guess someone's stance on a medical issue outside of abortion, based on their political party. That's wild to me.

Zakiya: I think the thing that we both understand and we're seeing more and more people start to understand is that all of this relates to emotions and attitudes and feelings. A lot of times as scientists, we're trying to just look at the facts and only think about the facts. And we think of people as these vessels that we just pour the facts into. Okay, now they got it. But what we know is how we feel in our emotions, they affect how we understand and feel about scientific evidence when it's presented to us.

Titi: And that's the fifth reason for science denial.

Dr. Sinatra: Our emotions are part of how we think and reason, and they have to be, you can't put your emotions in a box. But you have to use your emotions in service of good thinking and reasoning, and you have to be thoughtful about that. So you can't let your emotions derail a good reasoning process. So if you're too anxious about climate change, For example, you can shut down and not want to engage. And if you're too angry about climate change, maybe contributing to a change in how you'd have to live your lifestyle, you also shut down and don't want to engage. So you have to think about your emotions and how they're affecting your thinking, and then use them in service of your thinking.

Titi: And is it just me or does it feel like it could apply to many areas in our life and not just science denial? It sounded like Dr. Sinatra was preaching a little bit

Zakiya: Baby it is a read. Okay. You already know .

Titi: Some of y'all just got your edges snatched and you don't even realize it. Check the mirror. Are you bald?

Zakiya: So let's take a break. And when we come back, we'll get into some of the solutions for challenging science denial.

Titi: We're back. And we've been talking to Dr. Gail Sinatra and Dr. Barbara Hofer about their fascinating new book. It's called Science Denial: Why It Happens And What To Do About It out now from Oxford university press.

Zakiya: In the first half of the dissection, we learned what science denial is and what it isn't just to recap, we went through five reasons for science, denial, mental shortcuts, and cognitive biases, beliefs on how and what you know, motivated reasoning, social identity, and emotions and attitudes. So now let's get into the solutions. What can we do about it?

Dr. Hofer: Often, the solutions are talked about as though it's, one-on-one individuals making change in their own thinking, and it's more than that. We need solutions at a higher level. And for example, a couple years ago, Twitter started responding if you tried to retweet something that you had not even opened, you've just liked the headline that you get a little message back that says, would you like to read it first? And that moves people from system one to system two, thinking in that moment.

Titi: Nobel Prize winning psychologist, Daniel Kahneman talks about system one and system two, thinking in his book, Thinking Fast and Slow.

Dr. Hofer: So system one is that very quick, intuitive response. That is that gut level confirmation bias. For example, and system two is the slower analytical, thoughtful aspect of the mind. And a lot of the times we're operating on system one and it works for us.

Zakiya: A lot of times we're using system one and that's okay. You often need to make fast decisions and you don't need to tire your brain out over and over. So for example, if you're driving and you need to make a split second decision system, one is your go-to then

Dr. Hofer: But it's not a great thing when we're trying to figure out, should I inject bleach into my system in order to address COVID. Do some more work. Don't just do it because you've just found it online or some friends said to you or you saw it on Facebook. Instead slow down.

Titi: Yes, absolutely. Take a beat and really look for substantial evidence. Like it does not serve you to get to the answer quickly if it is the wrong answer.

Zakiya: So this is great to think about in this kind of system one versus system two. And it seems like, you know, Twitter and even the things on Instagram that say this is about vaccine, blah, blah, blah. Those things are prompting system two try to get you to engage more analytically. I mean, it's great to see this kind of stuff

on social media and where information is being shared, but it still feels like there's a lot we can do as individuals to combat science denial as well.

Titi: Yeah and one of those things is practicing more balanced and informed research, especially when you're doing your Googles.

Dr. Sinatra: Do your own research means google it for most people. I can't go do research on ice cores or ocean acidification. That's just not going to happen. So when we say do your own research, it's really not realistic because you really can't dive in to the research, the way the scientists do. You look for information online and you have to be very discerning. That takes time. It takes effort. And you have to know what you're looking for, what to be aware of. For example, the source, who paid for this research, who's sharing this information and to be able to evaluate that takes a lot of awareness and education.

Zakiya: The whole point of Googling something is to get answers quickly. When you think of it, that way, it's kind of counterintuitive to slow your brain down and really approach a subject analytically. And that's okay if you're looking for the best fall boot. Right. But I think when it comes to making big decisions about your health, that kind of quick judgment is not going to serve you well. One of my favorite things to do when I'm really trying to get knee deep into the information is scholar. Google.com for a peer review research.

Titi: Yes.

Zakiya: You know, when we think about it, that's what these PhDs are. Well, at least a large part. Is in research in the ability to look for information, judge it, combine it with other pieces of information to figure out what the landscape is and to say, here are some of the holes, or here are some of the unknowns and knowing whether or not you have the tools to answer some of those questions.

Titi: That's always, what I say is one thing that I learned from getting a PhD it that I don't know anything.

Zakiya: I'm skeptical of anybody who thinks they know everything about a topic.

Titi: I established myself as a expert in a very specific field. People come to me and they ask me questions and I feel absolutely confident saying, I don't know,

that's one of my favorite answers, but the next step is saying, how do we get to the right answer? Like, I don't know, but what questions can we ask?

Zakiya: Yes.

Titi: And we can do that together. Dope labs.

Zakiya: You know, I think this really makes me think about how we teach people to ask questions. And even what we teach science as. I think so often science is taught as the series of facts. And the truth is that it should be more of a kind of probing questions, right, to understand, to find the boundaries of what you do and don't know, like you just said. And I think that's been a lot of the conversation like, oh, we've been lagging in stem and science education for so long. Is science education, the answer to all of this?

Titi: I don't know. I think maybe it's just a piece of the puzzle to getting us to a better place.

Dr. Sinatra: We would argue. Let's improve science education, but you're right. It's not just about more science content, but we think students need to learn is more about how science is done. The process of science. For example, at the beginning of COVID information kept shifting about masks and whether to wear them or not. And whether you could contract COVID from touching surfaces. And whether you had to spray down your groceries

Dr. Hofer: They didn't understand that this is what scientists do. They chip away at a problem. They work on it. They try to corroborate what they know and that this has been done very, very well in this period of time. But a lot of people have dismissed science because they think, oh, what do they know? They just keep changing their minds.

Dr. Sinatra: But in fact, the strength of science is that it does change based on new. And I think we have not taught that enough.

Titi: Absolutely. As Dr. Sinatra and Dr. Hofer explained, it's also about educating people on how science and the scientific process actually works. And by the way, that's also why we decided to structure this podcast the way that we do.

Zakiya: Yeah. I think we're constantly asking new questions and taking in the information we have and saying, what kind of conclusions do we come to based on what we learned and then what else do we see that we don't know? You know, often our conclusion is just more questions and I think we've also seen this over and over again during COVID.

Titi: Yeah.

Zakiya: If you think back to the early stages of the pandemic, people were like, we just want something to make this over. And it's like, oh, Hey, we have vaccines. And then folks are saying, I don't know if I'm going to have a vaccine. And then now people are saying we should get a booster. Should we not, whether it's effective, who should get them? You know, I think we're constantly just collecting data we're seeing what's happening in other countries, but we're also seeing that there are some things separate from just the hardcore science, but around social interaction and behavior that make some things transferrable to the United States. And some things are not, you know, and all of that is part of that reiteration, right. And that constant morphing of science of everybody bringing things in and some people saying, oh, that's no good. Toss it out. You know, the quality is poor there. All of that is the constant proofreading and editing of the scientific narrative I think.

Dr. Hofer: And then the research that Gail and I have each done independently and coincidentally we've discovered that students are overly schooled in the scientific method. They think that every scientist does this controlled experiment with a hypothesis and a control group. And so as a result, they dismiss some of the findings that require more abstraction, more inferential reasoning, more observation. So for example, climate change is really confusing to people like that. Well, how do they know they didn't do an experiment?

Dr. Sinatra: Well, that's why I think some people really were taken aback when the science changed so quickly about COVID because perhaps they were taught that here's the textbook full of facts about science. And they're the same textbook we use five years ago and nothing's changed then this is how science is. And of course, science is not a collection of facts. Science is a process, science is an approach to evidence. It's an attitude, as Barbara said, and we need to teach it like that so that people understand that of course science changes, of course, there's new information and you can use a scientific attitude in your day to day life.

Zakiya: Titi, you always say this, you gotta be willing to change your mind.

Titi: Yes.

Zakiya: You've been talking about scientific attitude all this time

Titi: And I really believe that for most people, the hardest part is unlearning

Zakiya: Yes.

Titi: Going into something, feeling like you know something is a fact and then finding out that it is not unlearning that fact is really, really difficult. I think that's something that's hard for everyone, but you have to be open to the idea of. And once you are open to it, then you can really enter into these conversations and say, okay, I'm open to having my mind change because new information comes in. And the last piece of the puzzle beyond organizations and individuals, is science communicators, researchers, and professionals themselves. We need to open up the scientific community and make it more accessible

Dr. Sinatra: to everyone. We have too many scientists who just talk to each other who publish in journals that only other scientists have access to, they're behind firewalls. And then when they go to talk to the general public, none of us humans can understand them. So we need to do a better job training our scientists to be science communicators. We need to develop their ability to communicate better about their work. Dope labs is an excellent example of what we can do, which is make science more accessible to the general public.

Titi: Yeah, I think we have a lot to do as scientific communicators. We do a lot of work with this show. Trying to bring science to the people and do it in a way that makes sense for everyone in a way that's fun for us and, you know, hopefully fun for everybody else to listen to. But I think that for such a long time, the way that science was communicated, it was communicated in a way to big up the scientists. But now we're finding that that does not serve the people.

Zakiya: No

Titi: And we do science in order to advance our world. And if we don't include the people we are trying to serve as scientists, what is the point

Dr. Sinatra: If we in education don't do a better job promoting digital literacy, algorithmic literacy, critical literacy, so that we can have critical thinking and students in K through 12 and higher education who can evaluate evidence and think critically about it, then we're going to continue to have these challenges.

Zakiya: So we're trying something new every now and then Titi, and I will share one thing that we either came across experience, want you to experience or know about in our lives. Titi what's your one thing this week?

Titi: So my one thing this week is that I actually saw on Instagram that Jordan Peele was selling the Get Out screenplay with all this extra information and the entire script. And so I jumped on that ASAP and it's really, really cool. It has some words from Tananarive Due, which Zakiya I know you're a big fan. And then we get some extra context from Jordan Peele. There's a section in the back that has deleted scenes. So it lets you know, like what they were thinking about adding, but ended up on the cutting room floor and there's an alternative ending that's at the very end. So I'm really looking forward to reading this and just seeing all the little notes from each scene that made Get Out, become what we know it today.

Zakiya: Awesome. I didn't even know that was happening.

Titi: What's your one thing?

Zakiya: My one thing is really based on preparing for this lab. When I started reading science denial, I really became interested in what I considered irrational behavior. And so I picked up a book that was already on my shelf. It came out in 2008 but it felt so timely. And I felt like it read me for filth. Okay. Predictably irrational by Dan Ariely, who is actually at Duke right now. He wasn't there when we were there. I don't think, but it's like behavioral economics. It helps us understand why we do some of the things that we do and how we actually are irrational. And we can predict some of our irrational decision-making.

Titi: I love that. Okay. So when you're finished with your book, I'll give you the get out book. We'll do a book exchange so that I can get my life with yours

Titi: Yes and you'll

Zakiya: have all my notes and highlights.

Titi: I love that. That's my favorite thing.

Zakiya: That's it for lab 037 if you have some other stuff to think about some more questions, please be sure to call us at (202) 567-7028. And tell us what you thought or give us an idea for a lab. You think we should do this semester? You know, we like to hear from you that's 2 0 2 5 6 7 7 0 2 8.

Titi: If you love today's episode, there's so much more for you to dig into on our website.There'll be a cheat sheet for today's lab. Additional links and resources in the show notes. Plus you can sign up for our newsletter, check it out at dopelabspodcast.com. You can find us on Twitter and Instagram @dopelabspodcast

Zakiya: and Titi is on Twitter and Instagram at @dr_tsho.

Titi: And you can find Zakiya on Twitter and Instagram @Zsaidso.

Zakiya: And don't forget to follow Dope Labs on Spotify and tap the bell icon. So you never miss when a new episode drops

Titi: Special thanks to today's guests Dr. Gail M Sinatra and Dr. Barbara K Hofer, their books Science Denial: Why It Happens And What To Do About It is available now from Oxford university press check out indie bound.org, where you can find your nearest, independent bookstore and pick it up. Dope Labs is a Spotify original production from MegaOhm Media group.

Zakiya: Our Producers are Jenny Radelet Mast and Lydia Smith of Wave Runner Studios,

Titi: Editing and sound designed by Rob Smierciak

Titi: Mixing by

Zakiya: Hannis Brown

Titi: Original music composed and produced by Taka Yasuzawa and Alex Sugiura

Zakiya: From Spotify our executive producer is Gina Delvac and creative producers are Barron Farmer and Candace Manriquez Wrenn

Titi: Special thanks to Shirley Ramos, Yasmeen Afifi, Kimu Elolia, Teal Kratky and Brian Marquis,

Zakiya: Executive producers from MegaOhm media group, are us

Titi: Titi Shodiya

Zakiya: and Zakiya Whatley.