Opinion Science Podcast

Hosted by Andy Luttrell

Explaining Brains with Alie and Micah Caldwell

June 21st, 2021

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Andy Luttrell:
I love doing this podcast. Being able to bring insights from psychology, political science, and communication to anyone who's interested is an amazing privilege. The seed of it started back in 2015. As a graduate student, I started making fun little videos, explaining findings from social psychology, and putting them up on YouTube. Some of those videos took off and so I made some more. I put together video courses about psychology and it all led to this podcast. The research and psychological science, the process of communicating those findings, and the creative process of putting it all together, it's a perfect balance for me. But I'm far from the only one doing this kind of work. At the same time, I was making my first YouTube videos, I saw another YouTube channel called Neuro Transmissions, which was also getting started, making videos to explain brain science to a curious public.

While my own YouTube activity has been more sporadic over time, I've enjoyed following Neuro Transmissions ever since. They recently passed 100,000 subscribers, and today I'm excited to talk to the brains behind the operation.

Alie Caldwell:
… in clear and simple ways. That's why we created Neuro Transmissions. It's not rocket surgery, it's brain science. Every other week, we cover a new topic in neuroscience. What's a neuron? How does it work? We break down the senses, from sight, to smell, and everything in between. We talk about higher level topics like attention, language, learning, and memory, and we're focusing on social topics too, like the psychology of Jedi mind control. In upcoming videos, we'll work on other…

Andy Luttrell:
You're listening to Opinion Science, the show about our opinions, where they come from, and how they change. I'm Andy Luttrell and today we return to the show's interest in science communication. To me, science communication very much falls under the umbrella of Opinion Science, as public faith in science and scientists can sometimes be tenuous. Science communication is an important endeavor, so to learn more about it I talked to Alie and Micah Caldwell, who co-produce the YouTube channel, Neuro Transmissions. Their videos present the basics of neuroscience and psychology in an accessible, engaging way. Alie is a neuroscientist and Senior Science Writer at the University of Chicago Medicine. Micah is a Licensed Professional

Clinical Counselor. And they've recently written a book that's about to come out. It's called Brains Explained: How Your Brain Works and Why It Works That Way, and it's out tomorrow! We recorded this a while ago, and the publication date changed in the meantime. So you'll hear Alie say it's coming out in May. Just mentally replace that with "June 22nd".

I had a chance to see the book, and it's so good! The design work is so good and punchy and informative. I saw a digital copy, but I'm excited to get the printed book to keep in the living room and page through here and there. I've already laughed out loud a couple times—it's a very fun way to learn about the past, present, and future of brain science and the people doing the science.
In our conversation, I talked to Alie and Micah about the origins of Neuro Transmissions, their tips for science communication, and their new book. So, let's jump right in.

The first thing that I wanted to mention is that the video, Postdoc Me Now, is maybe the best thing that exists. I have watched it a bunch of times and I just watched it again last week, and I was like, "Man, it's just so…" You nailed it.

Video Lyrics:
Postdoc me now,
I've been here such a long time,
I'm published and all.
Postdoc me now,
And I got a little funding,
So, give me a call.
Postdoc me now…

Andy Luttrell:
So, how much of that was you guys? Because I know it was sort of a big group thing, but I get the sense that either one or both of you were behind pulling the strings on that a little bit.

Alie Caldwell:
The lyrics and the song, so the original lyrics to the song were written by one of my classmates on the drive to our annual retreat a few years before we ever recorded the music video. So, that was kind of where the idea for the song came from. But then in terms of the music video, so the way that we did those music videos, so the first one, we just kind of got pulled into by accident, but that was actually the third music video that we did. And the way that we did the second two was we sort of did like a group poll of all the grad students in my program and kind of let people suggest songs, and talked about options, and then we picked whatever was the most popular.

So, Postdoc Me Now won out that year, and then we kind of took the reins from there on that project, and Micah especially in terms of thinking creatively about visuals and everything. Micah was really on that.

Micah Caldwell:
Yeah, so just to sort of give a little bit of background, so the video was made for essentially this conference that happens every year, but it rotates to different cities, and so it comes to San Diego about once every two or three years. And so, before that, we make these music videos to kind of

promote the party that they're throwing at the conference, and that was the inspiration for even doing this music video in the first place. And so, like Alie was saying, the first one was on accident. We didn't really know what we were doing. We were just like, "Ah, we'll just throw a bunch of things together."

Alie Caldwell:
Well, I mean they already had the song written, like they already had it all. They had the lyrics written. They had it all planned out. And then I had just started grad school and I was like, "Hey, if you guys want film help, music help, my spouse does a lot of this stuff just for fun, so if you want help…" And they were like, "Yes, please help us."

So, that kind of started the whole thing.

Micah Caldwell:
Yeah. But then with Postdoc Me Now, we knew… You know, we keep trying to raise the ante every time we do one of these, and we already had the lyrics, and so it was just a matter of doing it creatively and in a way that would pull people in, and so we tried to make it sort of the one shot looking thing and have the lyrics popping up just to really draw folks in, and it ended up doing great. It was like one of our most popular videos, so-

Andy Luttrell:
Yeah. It looks… Yeah, it just came out so good. So, that means then that the video production stuff was sort of in your back pocket for a long time and sort of… So, where did that come from?

Micah Caldwell:
Yeah, so I have always been kind of a video nerd. I started making music videos with my little brother just like in our house when I was in high school. And then in college, I started learning special effects and aftereffects more specifically, I guess, through Video Copilot. I don't know if you're familiar with Andrew Kramer. He's this guy who put up all these free tutorials back in the early 2000s. And so, anytime there was a video project in college, people would come to me and say, "Hey, can you help me with this?" And I just started doing that and then started operating like my own small little YouTube channels on the side, as well, about whatever I was interested in at the time.

And then that kind of led to eventually making Neuro Transmissions, which has been great.

Andy Luttrell:
Yeah. It strikes me, it reminds me, like growing up I had a similar, like I just was toying around in Photoshop constantly in high school, trying to learn aftereffects with however I could get my hands on it.

Micah Caldwell:
Totally.

Andy Luttrell:

Yeah, and then in college I was in a sketch comedy group and I was the one who was like, "We gotta make videos. We can't just do all this stage stuff." And trying to do creative things like that. And again, it's just sort of that it was fun at the time, and then eventually, it became useful.

Micah Caldwell:
Right. Exactly.

Andy Luttrell:
It's like, "Oh, it was worth all that time that other people might have said I was wasting."

Alie Caldwell:
Yeah. Totally.

Andy Luttrell:
And now it actually is paying off in this way, so I guess that brings me to the question of where Neuro Transmissions came from, right? If I were to guess, here's my guess, is that this video project, that original one that you said at the beginning of grad school, was sort of like kind of put a bug in your ear of like, "Oh, this… There's something going on here." And then an interest in science communication that just then got connected to this skill set that was already there, and then it took off from there. So, how close am I on that?

Alie Caldwell:
Very close.

Micah Caldwell:
You're pretty dang close, yeah.

Alie Caldwell:
Yeah. When Micah was doing his own YouTube channel stuff, I was kind of not really into the idea of being on it originally, but I had started to appear in more of his videos, and participate a little bit more, and then we did this music video, and then a friend pointed us at a video contest that's hosted by the Society for Neuroscience professional society. He was like, "Oh, you guys should check this out." And so, we decided to enter, because I've always kind of considered myself a writer, but I had never made the connection between writing and science, like I had never really thought of how I could combine those two interests.

So, I wrote a script for this contest and we filmed it and we won second place in the contest that year, and then we were like, "Wow, this is pretty fun. Maybe we should keep doing this."

Micah Caldwell:
Yeah. Just sort of grew out of this initial contest, and people liked it enough that we were like, "Oh, maybe there's something to this. Maybe we can combine our interests and have this sort of hobby crossover of writing and filmmaking to have something that we collaborate on."

Alie Caldwell:
Yeah.

Andy Luttrell:
So, the science communication part, it was like revealed to you just because this opportunity was sitting at your door? Or you had had an interest in doing science communication before that?

Alie Caldwell:
No, I just kind of… I mean, I was brand new in grad school. I was really convinced at the time, like I'm gonna become… I'm gonna do a postdoc. I'm gonna become faculty. I'm gonna follow a traditional academic job route. Maybe I'd consider industry, but I always thought of writing as something that I would do in my own time, and it would be creative writing. It'd be fiction. It'd be poetry. I had not really thought about it beyond just like starting to get connected to the Twitter science community and starting to kind of build my network in that way, but it really… Neuro Transmissions came first and then that led to all of these other opportunities to meet people and be in this space, and really sort of think about what that meant long term.

Micah Caldwell:
Yeah. The real reason that we angled the channel the way that we did was you look on YouTube back five years ago or whatever, and you searched neuroscience, and the results that would come up are hour-long lectures, you know? Or somebody's like crappy iPhone camera of just like, I don't know, showing some experiment. There was not really very much information that was being given about the basics, about how neurons work and all that stuff. And so, we thought, "Oh, that's kind of an opening, and would be interesting, and Alie has expertise in that area." And so, that's where it kind of grew out of.

Alie Caldwell:
Yeah.

Andy Luttrell:
So, there was a gap in what was out there, and you just happened to be ready to fill it.

Micah Caldwell:
Yep.

Alie Caldwell:
Yeah.

Micah Caldwell:
Exactly.

Alie Caldwell:
There have been a number of other channels since that are starting to create more content similar to ours, but a lot of at the time was either extremely clinical, like very med ed kind of animations, or else were just Khan Academy whiteboard style videos, and we were kind of like, "Well, I think we can make this a little bit more engaging, and I think we can use Micah's, leverage Micah's skills as a creator and animator to actually sort of provide some life to these ideas." And that kind

of drove that first… We wrote the whole first season before we even started recording, just planning out this intro to neuroscience course, and then kind of started expanding from there.

Andy Luttrell:
Yeah, it is true, as a teacher, when you're looking for videos to share, it can be real tough. You go, "I don't really stand by any of this."

Micah Caldwell:
Right, right.

Andy Luttrell:
I could do a better job just explaining this stuff in class than having some of these, like you said, just kind of boring lectures that maybe have the right content, and my sense is that even as YouTube has really exploded as a medium, it is easier to be a YouTuber when you don't really have to stand too closely by what you're saying.

Alie Caldwell:
Yes.

Andy Luttrell:
And can just kind of like, "Oh, I'm gonna record something for 20 minutes today and then that's gonna be my video."

Micah Caldwell:
Right.

Andy Luttrell:
Whereas, I mean, I've found that it's just such a slog when you're like, "If it's gonna be good and right, it takes forever." So, I wondered if you could talk about… I guess an interesting way to frame this would be in the early days during that first season, how did you approach actually putting together one of these videos? And then in a little bit, we'll backtrack and think about how that's changed since then. So, at least in the beginning, what did that process look like?

Micah Caldwell:
I mean, back in the day, when we first started, like Alie was saying, we wrote out the entire first season as we called it, where we had essentially like five videos planned out, and then we would record in bulk. And the goal was to create a video that was shorter than five minutes, so that you could get in, get the info, get out, and using a lot of animation to really bring the concepts to life. So, very much more animation heavy and yeah, and also very kind of high energy to keep people's attention during those five minutes.

Alie Caldwell:
Very Bill Nye kind of in the first iteration, which actually was like one of the number one criticisms we got, so it's like-

Andy Luttrell:

Oh, really?

Alie Caldwell:
All those noises in the background are really distracting. And we're like, "Okay, so we're gonna stop doing that." So, that's definitely been a huge part of it, is adjusting as we've gotten feedback, but initially… I mean, there was also the challenge of working together creatively in a way that we hadn't before, so I don't… I mean, I don't know if this is clear to your audience, but Micah and I are also married in real life, in addition to being partners on the channel, and so developing these projects was really challenging, and kind of learning how to take direction and feedback from each other was challenging, but it was very, very time intensive in the beginning. I think between… Like, from the conception of the first season to actually filming and posting was like six months. And was very focused on like, okay, textbook information, and we were still learning how to use YouTube effectively at that point, and we're still learning. Nobody knows how to use YouTube effectively, but I mean definitely one of the challenges is that, like you said, YouTube is not optimized for educational content. It's really optimized for entertainment.

And as a result, a lot of the things that you have to do for top quality educational content are things that do not play very well with their algorithm, and so we've spent a lot of time, like at the time we just created our videos and threw them up there, and we didn't really think too much about who was watching them, or worry too much about our audience size, but spent a lot of time thinking about how do we balance those challenges, right? How do we create content that we stand behind, that we're really confident in, but that also is stuff that people are gonna watch?

Andy Luttrell:
In terms of what you've learned about using YouTube effectively, what were some of those changes, right? Like other than just saying like, "Well, here's the video about this. Enjoy, everybody."

Micah Caldwell:
Right.

Andy Luttrell:
What does it take to get more eyeballs on that? Because I do think… So, just to pull back the context for that, the challenge in a lot of science communication is just that issue of getting the word out, right?

Micah Caldwell:
Right, right.

Andy Luttrell:
It is not the kind of thing that people often willingly step into. And you sort of need to grip them in a way that they're gonna pay attention, and again, that you're not sacrificing what it is that you're saying. So, what have you learned outside of the production side, but in the distribution side? What does it take to reach people?

Micah Caldwell:

Yeah. It's changed quite a bit I would say since we started. The first thing being I don't think we are as strictly textbook as we used to be. You know, there was a lot of focus on just give them the pure information and then that's it. And what we found is that engagement is terrible on that. If people are coming for just the pure information, then that's all that they'll really stay for, and what we found is that personality, personal experiences, something that people can connect with has been a really important piece of not only having people watch the video for longer, but also then giving them a reason to subscribe and to want to actually see your next video, too.

So, that's been one thing that I think we've started to incorporate more and more, as well as not worrying about time. We used to make these five minute short things, and clearly that doesn't perform very well on YouTube, and that has changed I think over the years. And then distribution side, just sort of leveraging social media and trying to get it out to the proper channels or sources for people to want to watch it, although frankly, most of our viewership comes from within YouTube's ecosystem, from like browse features and stuff like that.

Alie Caldwell:
Yeah. I think a really key kind of shift that we've had is like Micah said, moving away from purely sharing information. And not just like our own, not just sharing our own personalities, but also starting to focus on topics that are gonna be personally relevant to viewers. So, some of these, I mean, some of it's kind of cheesy or not super well backed by science, but it's stuff that people are curious about, so like we did a video about the science of gratitude, or like one of our most popular videos is a video about the science of cannabis, and in that video we really try to take this very holistic look at cannabis, so both talking about its historical use and sort of demonization in our culture, and where that came from, and why it is that way, and then also we actually went into a cannabis dispensary and talked to some of their folks there, and kind of talked about the evidence that it's safe, and the evidence that it's not safe, and really kind of making it more of this larger narrative rather than just being like, "Here's a piece of information that you want."

And some people don't love that, right? Because there are people who are just trying to get that piece of information. Some people are like, "I don't care about the history of cannabis." But I'm like, "Yeah, but it's relevant, right? If we haven't studied cannabis for 70 years because everybody thinks it's gonna kill you, then that's relevant to why we don't know if it's safe or not."

Andy Luttrell:
So, as the content has evolved, I guess my question is how have your goals evolved? So, like what are you trying to do? If you were trying to answer the question, again, five years ago and today, what are you trying to do with this YouTube channel? What would that be?

Micah Caldwell:
I think five years ago we would have said like, "Oh, it would be great if our videos were used in classrooms." You know? If it could be used as part of a curriculum, or even removing one step from that, if anyone could essentially learn a basic neuroscience class by watching our videos. I think that we wanted to sort of establish a base and we did that with our early videos, and then expand out from there into other more interesting topics, or other different topics. And today, I think the focus is frankly on doing things that we enjoy.

Alie Caldwell:
Yeah.

Micah Caldwell:
You know, and making videos that appeal to us, because if we're excited about it, if we are interested in it, then we think that maybe other folks will also find it interesting. And yeah, I don't think there's as much focus on like what's the most optimized topic that we can talk about right now? Because frankly, we're not really producing at a speed where we can follow trends or anything like that, so instead we kind of follow our own passions to make our videos.

Alie Caldwell:
Yeah. On my end, I think my motivations have been a little bit different all along, because this is still kind of Micah's side hustle, this is his like passion project, but this actually… This work has… It is still my side hustle too, but it also led directly to my current career path. I'm a full-time science writer now, so early on there was definitely sort of a motivational factor of like, "Oh, this is something I haven't considered doing before, so let's do this. Let's practice this. Let's see how this goes." Again, this led to all these other opportunities, so kind of continuing to grow my portfolio and my experience and listening to feedback and all of that.

And something I think about a lot now, as a full-time science writer who has this sort of side hustle, I think a lot about my platform, and how I can use this platform to share messages and things that I think are really important, so again, sort of moving away from just talking about things that are very fact focused, which is still a focus, like we still talk… Everything we talk about is evidence-based, but we talk a little bit more about some of the social science behind things than maybe we used to, and really trying to talk about these issues, especially as a woman on the internet, especially as a female scientist, there aren't a ton of female science YouTubers out there, so really trying to use this platform that has been growing really steadily since we started to talk about some of these issues, and to make our stance clear on things.

You know, initially we were very much about separating our personal lives from the channel, but now we talk a lot more about how this stuff affects us, and how we feel about it, because I think it's really important that if you have a platform that big, you… Kind of like you said, you should be willing to stand behind it, and that doesn't just mean the facts. That also means the values.

Micah Caldwell:
Well, and frankly, the evidence supports this too. If you look at research coming out about communication and how to effectively communicate something, you need to connect with people on their value basis, right? On what they believe, how they view themselves as people, and you do that through story. So, I think we've been trying a lot to build in more narrative, which then inherently means that we kind of include ourselves into that in order to connect with whoever's watching the video, so that they don't just get bored by hearing fact after fact after fact.

Alie Caldwell:
Yeah. Andy knows all about that. I mean, this is like his whole thing.

Micah Caldwell:

Yeah. Exactly.

Andy Luttrell:
Sounds good to me. So, Alie, I was wondering at what point did you sort of decide to make a shift from the sort of trajectory you thought you were going toward to the one you ended up going toward? Like at what point did it become clear that science writing, science communication, was both something that was important enough and that you had the ability to pursue that it seemed reasonable to go all in?

Alie Caldwell:
Oh, I still literally question this every single day, so I want to preface it with that, like there's a lot of career anxiety happening over here. But I don't think there was any one moment during graduate school where I decided that I was gonna pursue science communication. It was kind of a cumulative process of both like I loved being at the bench, I loved doing my research, and then when I looked down the barrel of like what a career in academic science was going to be, I didn't… It wasn't that I didn't want it, it was just that I didn't want it badly enough. I didn't want to work that many years, not making that much money, only to have to fight over the scraps of academic jobs. I didn't want to have to move all around the world trying to find an academic position.

You know, there's so many things about it, and I also… I mean, some of that honestly was a struggle of just like I didn't have a ton of opportunities to present my research within the research community, and I didn't feel super connected to that community, while all of this YouTube work was giving me this opportunity to really plug in to the science communication community and build this network of incredible creators and communicators. And I think just getting enough consistent feedback over time really encouraged me to consider this possibility of pursuing it as a career.

And then left graduate school and ended up being very lucky to be a fellow in science communication at UC San Diego, which was a great opportunity, and I mean, just have kind of kept moving in that direction ever since. You know, and I do look back very fondly on my days in research, and honestly, my dream job would be like half research, half science writing, but that doesn't really exist.

But I think it is really hard to kind of let go of that identity as a scientist, and as a researcher, and really move full time into writing. I was just talking to somebody the other day saying like I literally, I have written hundreds of scripts for videos, I have a full-time writing job, I just finished writing a book, and I still feel weird calling myself a writer, so I think it's just kind of one of those identity things where in academic research, you really get attached to this identity as a scientist, and it's very hard to shift away from that, or to consider multiple identities in the same way that academic science encourages you to be a scientist.

Andy Luttrell:
It's weird. The academic world is a weird culture in that it is one that reinforces that identity, where your faculty mentors, obviously that's where they ended up, and so they go, "Well, this makes sense." And the people who go to graduate school often do so at least in the beginning imagining

that kind of outcome, so it is sort of like, “Oh. Well, this is how it works.” And no other path is really discussed.

Alie Caldwell:
Totally.

Andy Luttrell:
Or encouraged. And I have felt this way, toying at one point with looking at like industry-type jobs, to be like you’re also kind of leaving the family. There’s a little bit of like a family of, “Oh, you go to conferences. You see all these people.” And then you go, “Well, if I take a job somewhere else, I’m outside of it for a little bit.” So, it totally makes sense that there’s… It is not built to leap outside of that world.

Alie Caldwell:
Yeah. I mean, in some ways, I think it’s like it’s sort of deliberate propaganda, right? You want to convince people that they want to put in all these hours for this level of pay and everything, and that’s something I have to think about a lot when I’m feeling like I miss doing the research, or I’m feeling like, “Oh, man.” So, I think the other thing that you really get pushed toward in science is this idea that like you’re making a difference. You’re changing the world. You’re discovering new things about our existence. And leaving that is hard, and I like the work that I do, and I enjoy it, but it doesn’t quite have that same level of novelty, right?

And so, I think it really does become this daily conversation with myself about like there’s a lot of things in this world that I love doing and I can only do so many of them in a day, and so this is what I’m doing right now, and I like it, and it’s good.

Andy Luttrell:
Good.

Micah Caldwell:
Yeah. We were talking with a friend about how when you start off some of these side hustles, it’s sort of like, “Ooh, should I be doing this? Is this bad?” And how that can grow into something that opens up all these other avenues while you’re in grad school, for example, and that’s what happened with Neuro Transmissions, really, if you think about it. If we weren’t doing this, then you wouldn’t be where you are right now.

Alie Caldwell:
Absolutely not. Yeah. I mean, this… Neuro Transmissions is what sets my job applications apart every time.

Andy Luttrell:
So, you talked about being embedded in like a science communication community, and you’ve done some work in terms of I think helping scientists talk to the public. Is that right? So, do you have, for people who might be listening who are academic scientist researchers, who would love to be able to talk about their work or their science in a broad way, what kinds of things would you recommend to people as they think about doing this in an effective way?

Alie Caldwell:
Yeah. I would recommend… Lot of thoughts on this. First, and I think the biggest thing, is just do it. Which is to say that the metaphor I always like to use is like you would never expect to play Carnegie Hall the first time you pick up a violin, and the same is true for any kind of project or idea you have. And so, really just starting to create or communicate in some way or another I think is really the key, because it gets very easy to get hung up on like, "Oh, I have to come up with the perfect project, or the perfect blog title," or whatever. So, really just to start doing it.

But along with that, two kind of add ons. One is to look into existing resources and kind of learn about the literature. As you're aware, there is a lot of science on best practices for communication, especially when you're communicating around something like science, which is a challenging topic right now in a lot of communities. So, really taking the time to look at existing resources if you can, if you have the resources, or financial backing to do it, to try and take a course, or get some books, and just learn a little bit about it. And also, make sure that you're not recreating the wheel. I have run into a lot of people who have very, very cool ideas about science communication projects they want to do and have not bothered to take the time to figure out that there are already people doing that exact thing.

And I find that there are a fair number of scientists who think that getting into science communication is easy. They're like, "Oh, I can totally do that. I just talk about science? Totally. I can do that." And it's a thing that requires skill, like this is a thing… I have spent the last five, six years developing a skill set in, and it took time to get there. It took a lot of practice and effort. And so, don't assume that it's easy. Don't assume that you can just like waltz into a space and do the thing perfectly just because you're a scientist with a PhD, because I have colleagues right now who definitely don't have PhDs and definitely are way better at parts of my job than I am, because they have a skill set that I don't have yet.

Andy Luttrell:
You mentioned courses and books. Is there anything in particular you would point people to?

Alie Caldwell:
Off the top of my-

Andy Luttrell:
Just to put you on the spot.

Alie Caldwell:
Yeah, yeah. Off the top of my head, if you're a graduate student, I would recommend looking into ComSciCon. It's a workshop by graduate students, for graduate students, in science communication and science communication skills. So, there's local workshops as well as a national workshop. Recommend you check that out. It's also free to attend. If you have some financial resources, something like the Alda Center trainings, or the COMPASS Science Communication trainings are great resources. They just tend to be kind of pricey.

And Alan Alda has a book that I think a lot of people have really liked. I haven't finished reading it myself, but it's called… What is it called? It's like If I Understood You, Would My Face Look Like This? Or something like that. Yeah, it's something like that, but you know, Alan Alda's been a huge proponent of sort of thinking about how do we kind of better connect non-scientists with science and make them feel more part of the process, so he has a bunch of work out on this stuff that would be good to check out.

Andy Luttrell:
I guess the trick for getting started is like how, like if someone goes, "I'm interested in science writing," do you just start a blog? Start a YouTube channel? I mean, there are so many things out there that you could do, but is there like… If someone goes, "I'm interested. I want to do this, but I don't know where people go." Do you have any sense of that?

Alie Caldwell:
Yeah. I think it helps to think a little bit about sort of your goals and like why you're communicating, because I think it's very different if you're interested in sort of advocating for science funding, versus like teaching kids about science, right? But I think kind of the best first step is just to see what kinds of communities already exist in your immediate area. Right now, it doesn't even matter if it's local, right? But you know, is there a museum where you can go and volunteer in the museum? Or is there a local science advocacy group in your area? For example, there's a group called the Union of Concerned Scientists where you can help writing op-eds, or help advocate for stuff, so I think just kind of trying to push into what your goals are, like are you trying to do science journalism? Because if that's something you're interested in, then there's fellowships for that, or there are places that sort of actively take pitches from grad students about their science, or maybe your institution has an internship where you can work on this kind of thing.

But if you're really interested in policy, maybe there's a local politician, like you could start kind of doing more of that kind of advocacy work. So, really just I think starting local and thinking about what you are trying to do, but also thinking about your skill set I think is really valuable, right? Like we backed into video by accident because Micah was already doing video. If he hadn't been, I don't know that we would have ever gotten here.

And so, like if you hate writing, but you like talking to people, maybe do a podcast instead of writing science articles.

Micah Caldwell:
Yeah. That's what I was gonna say. Just marry your passion with your skill set, because if you want to make videos but you don't know how to make them, it's like, "Okay. Well… Maybe find something else."

Andy Luttrell:
That's what happened in March when all the professors had to start making videos.

Micah Caldwell:
Oh. I imagine.

Andy Luttrell:
And I was like, "Oh, thank God I'm ready for this." Like I was able to just transition immediately and I had colleagues who were like, "The sound isn't working." Oh, boy. So, even outside of trying to find a medium, a lot of scientists will find themselves in a position of being asked to talk about something, or discuss… I actually noticed I think during these times where travel doesn't happen that I almost think there are a lot more scientists providing opinions on news programming, just because it's so easy to reach out to people who are experts wherever they live. And so, I can imagine someone who goes, "I understand the importance of being able to talk about what my science says about something, but I don't know the first thing about saying that in a way that'll make sense to anyone other than my colleagues." So, even if we get at the lowest level, just like how do you talk about science to people who do not already have expertise in science?

Micah Caldwell:
The phrase that comes to mind that stuck with me, I think I heard this at a conference or something like that, is to-

Alie Caldwell:
You're gonna say the Alan Alda quote that he gave on campus.

Micah Caldwell:
Oh, did he?

Alie Caldwell:
Yeah.

Micah Caldwell:
The quote was don't underestimate people's understanding of science. Always overestimate their understanding of jargon. More or less.

Alie Caldwell:
The quote is never underestimate people's intelligence. Always overestimate their vocabulary.

Micah Caldwell:
That's what it is.

Andy Luttrell:
So, what does that mean?

Micah Caldwell:
So, essentially people can get stuff. Don't worry about them understanding concepts. As long as you are speaking to them in the same language, right? I think anyone who reads academic journals knows that it can be very dense, and even if you are in the field, you might still be confused when you finish it at the end. You're like, "What did I just read?" So, same thing here. Talk to people on a level that anyone can understand. Not that you're simplifying concepts, not that you're changing them in any way, but more just using I guess relatable terminology and phrases and all that stuff that anyone can understand.

Alie Caldwell:
Yeah. And something I encounter a lot in my current work, so I work basically as a public information officer for a university, and something I encounter a lot right now are scientists are kind of trained to feel like they're only an expert in this very, very small thing, and then they feel like they can only speak to this very specific topic, like I can only talk about the influence of astrocytic proteins on neuronal outgrowth, right? But the reality is that the process of doing scientific research is in its own way an experience that gives you some qualifications to talk about science, right? Like you understand the scientific process, you know what it's like to be doing the research, you know what it's like to have to review the literature. You have thought very deeply and critically about these things in a way that a lot of people who have never worked in science have not done. I'm not saying everybody, but a lot of people haven't.

And you know, so for example, like if I have somebody who's like, "Well, I'm not really qualified to speak about vaccine technology because I'm a pediatrician." And I'm like, "You are, though. You understand a lot about this and probably way more than 99% of the population." And so, really kind of feeling confidence and ownership over your expertise I think can really help with this too. Because it's like part of what is effective we said is the personality and the person communicating it, and some of that is letting your excitement for this stuff come through and talking about it in a way that people can see how much it means to you, and not getting too hung up on like, "Oh, but I'm only the expert in this very tiny thing and I don't want to upset my colleagues."

That's understandable. I get it. I totally understand there are politics that might prevent you from feeling comfortable speaking on a topic. But if your worry is that you don't think you're enough of an expert in this science, you're probably fine. Especially like when people… I had a really funny interaction with a friend once where he was telling about his research and I was telling him how I would explain it to a non-scientist and he was like, "Well, I image these protein molecules." And I was like, "Okay, so you take pictures of this protein." And he's like, "No, I image it." And I was like, "That doesn't mean anything to somebody who isn't a scientist."

Like, I get what you're saying, right? You're worried about being super accurate on this, but words mean different things in different contexts, and being aware of that is really important.

Andy Luttrell:
It reminds me, so I've faced a similar kind of feeling, and I saw someone write about it once when they were trying to coach science writers, or scientists who want to write about stuff for the public, and the concern is like, "Well, when my colleagues see this, they're gonna realize I'm speaking outside of what I know or I'm oversimplifying." And the point is kind of like, "But you're not addressing your colleagues in this context." Right? You are addressing someone who needs the first three steps to understand where this is going.

If they're so motivated, eventually they'll learn all the nuance and nitty gritty pieces of this, but you are not speaking to your colleagues, you're speaking to people who are unfamiliar with all the pieces.

Micah Caldwell:
Right.

Alie Caldwell:
Yeah.

Micah Caldwell:
I think it's a line to walk, because you don't want to overproject having expertise in something that maybe you aren't totally familiar with, but to Alie's point, there is sort of probably a base knowledge that people have that you can still communicate effectively and confidently that isn't sort of that overstepping.

Alie Caldwell:
Yeah. Well, and I think just being clear about your qualifications too is a really important component of it. So, like I have had the opportunity to do a lot of talking about the vaccine at work, right? And I tell people, I'm like, "I used to be a biologist, and this is what I know about the vaccine and this is why I think it's really cool." So, maybe to them, being a biologist isn't different from like being a virologist. There's a lot of nuance there that maybe a lot of people don't quite understand. But ultimately, I feel like I have a good grasp of the science and I feel comfortable talking about it from my own perspective of like, "This is why I think it's really cool."

And I think that kind of communication is also very effective generally speaking.

Andy Luttrell:
And it kind of goes back to what you were saying you discovered with the YouTube videos, which is that once it became a little more personal, it was more engaging, right?

Micah Caldwell:
Right.

Andy Luttrell:
And so, yeah, there's just like a real yearning for the humanity of the person who's talking and sharing these things that I think probably gets swept under the rug when the focus is a little bit too much on like, "Well, let's make sure we get all the facts straight." You might lose some of that touch that actually will get people to pay attention.

Alie Caldwell:
Well, and this is such a… You know, again, to use the vaccine example again, this is such a critical part of the conversation, right? Because just saying like, "This is how the vaccine works and this is why it's safe." That doesn't convince people the way that going to somebody and saying, "I got my vaccine. Here's how I felt after I got it. Here's why I chose to get it." People listen to other people's personal stories and use that to inform their own decisions, and so if your goal is to help people feel connected to something scientific, you have to make it personal, and that was kind of surprising to some degree too for us. We did a couple of videos around the time I finished my degree like about me finishing my PhD, and they got a ton of views, and I was really surprised

because I was like, “I didn’t think people cared this much about me as a person.” Just because we hadn’t been that personal in our videos.

And people just really do long for that kind of personal connection and I think people took a lot of excitement of like, you know, being able to relate to somebody’s experience, or kind of think about themselves having that experience in the future, and so I think really being personal is really important, which is hard for a lot of scientists, because you’re trained to not make your science personal, right? You can’t let it be personal. But you can’t separate the scientist from the work that they do, right?

The questions you ask in the lab are influenced by how you grew up, and how you were trained, and the things you learned in high school. All of these things play into the research that you do, and so trying to pretend like they don’t I think is really damaging, and it makes it harder for you to communicate your science to other people.

Micah Caldwell:
To put this into like a real-life context, we just released a video last week about preparing for grad school interviews, because it’s that season, and initially we titled it How to Choose the Right Grad School with Interview Tips and Advice, right? Something like that. And it tanked. YouTube gives us analytics and it said it was 10 out of 10 in terms of performance of the last 10 videos, so we were like, “Oh, that’s not good.” And we changed the title. We changed it to How I Crushed My Grad School Interviews, and now it’s performing at 1 out of 10. So, just kind of like totally transformed this video and it shows how much that personal connection can really make a difference and how attractive it is, too.

Alie Caldwell:
Yeah.

Andy Luttrell:
When I had asked before about walking me through how you went about putting a video together, I don’t think we ever quite came back to how that has changed, so if you think about these kinds of videos, or the things that are coming out now, how has the process of actually writing, shooting, editing, animating, releasing… We’ve talked a little bit about the distribution side, but how have you streamlined the production? If you have.

Alie Caldwell:
I think it’s actually gotten more challenging, just because I think we have a little bit… We have more obligations now, so we recently joined a creator network that assists us with finding sponsorships, which is a really awesome opportunity, but it also means that we’re that much more beholden to deadlines. You know, we can’t just skip a week. But I think we’ve also really kind of developed a system, like we’ve had to set up regular meetings to focus on YouTube together so that we can talk through strategy and make plans for future videos. And so, I think we’ve really kind of actually extended our planning timeline for each individual video, so even as we’re working on one video, we’re already thinking about and preparing for the next one, which lets us do more interesting topics, because we have more time to film, more time to bring in outside

experts. I think that's something we're trying to do more of, is bring in more voices, but obviously that takes a lot more planning.

But it's still a fairly similar process. I mean, in general, we write the script and Micah does the filming. And then editing, editing, editing.

Micah Caldwell:
Right. So, kind of to pull back the curtain a little bit, our typical process is we upload every three weeks currently, and so what that usually means is after a video goes up, the next script is being written or should be near finished, and then typically two weeks out, we'll film. And that gives two weeks to edit, and then we have to finish kind of a few days in advance for sponsorships and that sort of thing to get approval, and then upload on that Wednesday.

I would say, yeah, to Alie's point, we have changed our process quite a bit in that there's less planning and yet also more in some weird way, where we don't have all of our scripts written in advance. We are typically looking out four or five months in terms of planning out our topics and saying like, "Oh, what would be interesting now?"

Alie Caldwell:
Yeah, because a lot of these videos are also requiring a lot more, like I was saying, like they require more effort. So, like for example, I'm gonna do a video coming up next month that's gonna be about a particular wearable device, but that required me to like think in advance, and reach out to the company, and like I had to do all this review on the science that the device is purporting to use, and all that stuff, so like I got them to send me one of the devices to try it myself, so in addition to getting to talk about the science, I can also talk about how I used it, which I think people will be more interested in than if I just talked about the science of the device.

Micah Caldwell:
I think part of why, especially lately, things have been a bit different for us is just because of the book that we've been writing. That has really kind of crunched our time, because we both have full-time jobs, and then we also have this YouTube channel, and then we're also trying to write a book, so it's sort of this balance of like, "Okay, how am I going to use my time tonight?" And so, that's been a little bit hard.

Andy Luttrell:
Yeah. The last thing I wanted to talk about was the book, so would you mind giving a lowdown on what that's all about, what the book is about, and what the process of writing that was like?

Micah Caldwell:
Yeah, so we have written this book. It's called Brains Explained: How Your Brain Works and Why It Works That Way, and we teamed up with Weldon Owen, which is a publisher out of San Francisco, and it's a really fun book. It's all about how your brain operates and we sort of go through historical perspectives, and actually looking at current neuroscience and psychology, and we look towards the future as well in terms of what's up and coming. But it's all really fun. We do all these little vignettes. It's the sort of thing that you would have on your coffee table or like

the way that I've been talking about it, you'd have it in your bathroom, and you could pick it up, read a few pages, and have something really fun to tell at the cocktail party.

Alie Caldwell:
Yeah. It's a very pop science book. A lot of illustrations. We've been working with this really great designer through our publisher, so he's done a lot of really great work finding imagery for the book, but it's a lot of kind of one, two page pieces about all these different topics related to psychology and neuroscience, and kind of in keeping with our goals for the channel, talking about the good, the bad, and the ugly, so talking about really terrible mistakes that have been made in history, things that were based on really dark, or racist, whatever kinds of ideas, and sort of ways in which we're trying to improve, but also sort of these things that we can see being risks in the future, so really trying to look at things from a lot of different angles. It was a huge adventure doing this and like in the weirdest way. So, we actually got contacted by the publisher in summer of 2019, and then it just took us a long time to really get everything finalized, and get solidified, so we ended up signing our contract and starting the book in late February of this year, late February of 2020. And-

Andy Luttrell:
Good time to start a project.

Alie Caldwell:
Yeah. Great time to start a project. In a lot of ways, it was actually like our pandemic silver lining was we already planned on spending the next six months writing a book, so we didn't have a ton of plans to cancel. But just ended up having this sort of everything went topsy turvy, so our assistant editor unfortunately had to leave the project due to company issues, so then we had to get a new assistant editor, and just all this stuff kind of happened, and then of course we move cross country in the middle of writing the book, so it was a very wild roller coaster ride, but we finished the book late last fall. We actually just sent off our final feedback on the layouts this week and our publication date is May 18th. It'll be anywhere books are sold. You can find it on Amazon, you can find it on Weldon Owen's website, or yeah, what we would love is for you to go call your local bookstore and ask them to order some copies and get it from them.

But yeah, we're really excited. I mean, it was really hard, doing this in the middle of everything, but we're really proud of it and really, really excited to get to share it. There's a lot of stuff in there that people will recognize from our videos if they've watched our YouTube channel. There's a lot of stuff in there that has not been in our videos, so a lot of cool new topics that we might explore in future videos or maybe it will be a book exclusive. So, lots of fun stuff, and it was again, a really fun project for the two of us to work on together. Very new kind of thing to do. It was very fun.

Andy Luttrell:
So, the publisher reached out to you? You're saying you just sort of got this like, "Hey, you do science stuff." Like at what point was there the idea for the actual book itself? Like when was it born? Was it.. Because it sounds like you didn't go pitching this book to someone.

Micah Caldwell:

No. We were approached by the publisher, so the assistant publisher, assistant editor had seen our channel and was a big fan of it and pitched the idea to the publisher to have us write a book, and then they talked to us and we came up with the idea and pitched it back to them and they were interested. So, it really worked out.

Alie Caldwell:
Yeah. I mean, again, to this point of like having a platform… Especially lately, have really thought a lot about how having an existing platform has really been beneficial for a lot of other unexpected things. Have really given us a lot of opportunities we would not have otherwise had. Like this book.

Micah Caldwell:
And we think people will love it. It's really… It's not a textbook. This is the kind of thing, it's really written in our voices, and-

Alie Caldwell:
A lot of dad jokes.

Micah Caldwell:
Lot of dad jokes. Yep. All sorts of good stuff.

Andy Luttrell:
Was it a case of just sort of thinking, like you had the opportunity, like why this particular book? What was it about this format that you liked?

Alie Caldwell:
I mean, honestly, we hadn't really thought about… Again, I have always wanted to write a book, but had never really thought in depth about what that would look like, especially not a nonfiction book. And so, when the company, when the publisher approached us, they kind of pitched this idea of like, "We would like a book based on your YouTube channel." And this is the style of book that they do a lot of, these sort of like vignette kind of books, so they sent us some examples to consider and we just pulled a lot of inspiration from that and we were like, "You know," it was kind of clear because they had found our YouTube channel and were looking at it from that perspective that they did kind of want this vignettes based on our videos.

And so, really that gave us a lot of freedom, too, to cover a lot of different topics, right? We didn't have to think too much about this really strong narrative throughout the book, and instead could focus on these sort of smaller sections where we could really talk a lot of different interesting things in science, rather than just one topic throughout. And that, I think it just kind of grew naturally out of that, and yeah, they really sort of pitched us the idea initially and then we sort of like fine tuned it to really suit the way that we thought we could write a book, and I'm really excited about it.

Andy Luttrell:
Well, I'm looking forward to reading it. Just want to say thank you to both of you for coming on, talking about the work that you do. This was very cool. Always looking out for new stuff from you guys.

Alie Caldwell:
Yeah.

Micah Caldwell:
Absolutely. Yeah, thanks for having us. We really appreciate it.

Alie Caldwell:
Thanks so much and thank you too for the work that you do. I really want more people, especially scientists, to understand that there is a whole field of research out there on how to communicate with people and how people's communication influences the way that they think and interact with each other in the world, so I'm really excited that you're doing this stuff.

Andy Luttrell:
Well, thank you.

All right, that'll do it for another episode of Opinion Science. Thank you to Alie and Micah. Be sure to check out their fantastic YouTube channel, Neuro Transmissions. And keep an eye out for their book, Brains Explained: How Your Brain Works and Why It Works That Way. It comes out June 22nd, so there's a good chance it's out by the time you hear this…so go get it!

As always, check out the show notes for links to the things we talked about along with a full transcript. Subscribe to Opinion Science anywhere you get podcasts and follow the show on social media @OpinionSciPod. Check out OpinionSciencePodcast.com for everything else you could possibly want in this world. And hey, if you're enjoying the show, learning new things about public opinion and communication, and you're willing to spend a few seconds to help the show, leaving a nice review on your favorite podcast platform is not only nice to see for me, but also helps other people find us. Okie doke, that's it for now. I'll see you in a couple weeks for more Opinion Science. Bye-bye!