Catalyzing Safer STEM Learning Spaces

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Aubrianna: Hello everyone, and a warm welcome to Catalyzing Safer STEM Learning Spaces, the launch of the Courage to Act Foundation's At the Root Project. I'm so excited to welcome you into this space. My name is Aubrianna Snow and I'm the project manager at the Courage to Act Foundation. Today we'll be in conversation with Dr. Samantha Yammine, also known as Science Sam, about the importance of gender equity and STEM focused experiential learning opportunities. We'll start by sharing a bit about the foundation and our work to address sexual harassment in experiential learning, followed by our conversation with Science Sam, as well as an opportunity for questions about Sam's work and about the project. You'll also have an opportunity to engage with our survey which we're using to help guide the adaptation of our tools for addressing sexual harassment and experiential learning to the STEM context. Your feedback is extremely valuable and so, so valued in this work.

I'd like to begin with a land acknowledgement. This work is taking place on and across the traditional territories of many Indigenous nations. This land that I'm on is the traditional territory of the Cree, Blackfoot, Saulteaux, Dene, Nakota Sioux, and Métis, and is now home to many diverse First Nations, Métis and Inuit peoples. Edmonton, where I'm tuning in from, is covered by Treaty Six, which is an agreement signed by European representatives and Cree, Assiniboine, and Ojibwe leaders to peaceably share and care for the resources of this land. This agreement was broken by European settlers. The process of colonization in Canada has enacted systemic genocide against the Indigenous peoples of this land. We see these acts of colonization and genocide continuing today in the forced sterilization of Indigenous women, the epidemic of missing and murdered Indigenous women, girls, and Two-Spirit people, the overrepresentation of Indigenous children in care, the criminalization of Indigenous people resulting in overrepresentation in prisons, and environmental racism and land theft of Indigenous territories.

As we come together to respond to experiences of gender-based violence, we have to acknowledge this as a decolonial struggle, the two cannot be separated. Supporting decolonization and Indigenous sovereignty is critical to working towards a culture of consent and accountability. Today we'll be taking action by inviting everyone here to read the calls for justice within Reclaiming Power and Place, the final report of the National Inquiry into Missing and Murdered Indigenous Women and Girls. We also encourage you to visit native-land.ca to

better understand the land and territories you are on and the Indigenous peoples to whom they rightly belong.

So a moment to breathe, because this work can be really challenging. Many of us have our own experiences of survivorship and of supporting those we love and care about who have been subjected to gender-based violence. I encourage you all to take gentle care as we engage in some hard conversations today. I'm also excited to share our digital self-care room which you can access by visiting the link in the chat. OK, let's get into it.

The Courage to Act Foundation is a national non-profit focused on addressing sexual and gender-based violence in Canadian post-secondary institutions. We collaborate with survivors, communities, governments, and public and private institutions to co-design supports systems and strategies for safer and more inclusive campuses. The Foundation's journey started in 2018 when Possibility Seeds was tasked with developing a national framework for addressing gender-based violence on Canadian campuses. This led to the Courage to Act report and five years of deep engagement, consultation and collaboration with 4,800 stakeholders to implement the recommendations. Eighty-three evidence-based resources were created, and 79 learning opportunities were delivered. We're really proud that over 1.8 million students and more than 200 educational institutions across Canada have been reached. And of course our Foundation is continuing this essential work today through a research-to-action approach.

This project is really important to us. Women and gender-diverse students deserve to learn, work, and thrive in their careers. However, they're at a high risk of being subjected to sexual violence or harassment when they pursue science, technology, engineering, or math, or better known as STEM professions. When academic or work environments go unchecked, the impact on survivor wellbeing is significant. In cases where students are unable to complete their studies, feel unsafe at work, or leave their future occupations, there are losses for employers and the Canadian economy in recruitment and retention, productivity, innovation, and growth.

At the Root scales our national research-to-action project for employers, administrators, and students engaged in STEM experiential learning. At the Root focuses on resource development and adaptation, educational and professional development, and policy and legislative advocacy. Over the coming year we'll be releasing resources and hosting learning opportunities to advance the conversation on addressing and preventing sexual harassment and STEM focused experiential learning. You can learn about these opportunities by visiting our website and signing up for our newsletter. We hope you'll join us in this important work. And I

also really want to thank our funder, Women and Gender Equality Canada, we could not do this work without you. Thank you so much for investing in the safety of women and gender diverse people across the country.

Before we get into the conversation with Science Sam, I'd like to invite everyone to complete our resource adaptation survey by scanning the QR code pictured on screen. This survey is very important in guiding the adaptation of our resources to the STEM context, and we need your help to make these important resources a reality. No matter your level of expertise in STEM or sexual harassment your voice is crucial to guiding this work. So please take a few minutes to complete it and share it with your friends and colleagues.

A quick note on language and accessibility. Attendees can view live captions for this session by clicking on the link in the chat, and you can listen to the session in French by selecting the French language channel using the interpretation menu at the bottom of your screen. At the end of this session you'll find a link to an evaluation form, and we'd be really grateful if you would take a few minutes to share your feedback as it helps us to improve. This is, of course, anonymous. Following the session we'll also be sharing recordings in English and French on our YouTube channel so that you can come back to the discussion if you'd like, or share it with folks who weren't able to be in attendance today.

So before we begin the main conversation, a brief note on the format. You're invited to enter questions into the Q&A box throughout the session, and we'll pose these at the end of the session. We'll try and engage with as many of the questions as we can in the time that we have together. And, finally, I'm excited to introduce our speakers. From the Courage to Act Foundation we have Anoodth Naushan, our wonderful project director. Anoodth is a researcher, policy specialist, and community advocate who finds joy in supporting people and projects to advance gender, racial, and economic justice. She's worked with multiple organizations and institutions across Canada and the UK to strengthen support for survivors of gender-based violence. Recently she co-led Possibility Seeds, Courage to Act project aimed at addressing gender-based violence on Canadian post-secondary campuses, and this initiative has been recognized as a promising practice, and modelled internationally. Compassion, curiosity, collaboration, innovation, and equity are cornerstones of her work.

And we're also joined by Dr. Samantha Yammine. Dr. Yammine is passionate about empowering people to explore science and STEM by making it more familiar, accessible, and inclusive. She's a neuroscientist turned science communicator better known as Science Sam. She's the host of Curiosity Weekly, the flagship science podcast for Discovery,

and a regular science expert on CTVs Daily Lifestyle show, *The Good Stuff*, with Mary Berg. Dr. Yammine earned her PhD from the University of Toronto researching how stem cells build the mammalian brain before birth and maintain it throughout the lifecycle. In addition to her doctoral research she co-authored a crowdfunded research study exploring the effects that #ScientistsWhoSelfie on Instagram can have on public perceptions of scientists. She's also published in *Nature and Science* on communicating science online. We're so grateful to have you both here with us today, and now I'll pass the floor to Anoodth. Thank you.

Anoodth: Tell me, Sam, what first drew you to neuroscience and how did some of those early experiences really shape the way you think about who belongs in STEM fields?

Samantha: I think I'm a bit strange in that I have been obsessed with neuroscience from a really young age. In fact, I remember the day that I discovered the word neuroscience. I think I was – I don't know, I was probably like 12 or 13 or something, and I was just googling like what – or whatever we use to search, I don't know. I was just looking up like brain, career, study, learn, and the word neuroscience popped up, and I was like, "Mom, mom, I want to do this." I was just fascinated by people. I was so curious on the role of human behaviour, why was this person like that and this other person like this, and really a fascination with people. And then I learned that, oh, there's a reason why we all are the way we are, all of these cells in our brain make us who we are, and encode our experiences, and the way that we learn, and our memories, and feelings and all of our actions. That hooked me then, ever since.

And I think that early driver being wanting to understand people better has meant that I always think about the people in the work. Everything. I'm always thinking, "Who might see this? Who's personally living with this? Who's missing from this research?" And so I've always been thinking that there's a lot more work that needs to be done, I think, to bridge the people who most benefit from science and the types of questions we ask. And so I've always felt, because that was my driver, anyone who's ever been made to feel like they don't belong in science or STEM, they're exactly the people that we need. Because in neuroscience it's very personal, like it's our brains, it's who we are, and so we need every single perspective. And so, for me, that's always been at the forefront. Everyone needs to be in science so that everyone can benefit from science.

Anoodth: Yeah, absolutely. Absolutely. And that leads me to my next question — how has being a racialized woman and also a first gen student in science really shaped how you show up in your field?

Samantha: I mean it's interesting you say that. So I wouldn't consider myself a racialized woman. The reason I say that, I am Arab, I'm Lebanese by ancestry, culturally, ethnically, but racially I look white. And that, for me, being racialized is what do people look at you and assume, and then how do they treat you because of that. And I would say being in a city like Toronto, I'm very much considered white, and I haven't experienced a lot of racism. That's not true for all Arabs, and it's not true for all contexts that I'm in. If I'm in a small town, or certain parts of Europe, or my hair looks a bit different that day, I am. Or I'm at the airport, and my family at the airport, it definitely weighs where I feel racism. But for the most part I have the privilege of being white.

And so in my STEM career I would say being first generation and being a woman, those were the things where I really felt the impact there. And when it comes to being first generation, like no one in my career or no one in my family was a scientist, no one pursued higher education like beyond an undergrad. My mom was the first in the family to do an undergraduate. And I think there was a hidden curriculum. So a lot of things I just didn't know. Like I didn't know what it even meant to be a scientist. Like even when I was applying to grad school I didn't really know what grad school was going to be like. I didn't know what to put in my application, I didn't know I needed research experience and that I missed the deadline for summer research opportunities. So those were really big things that I would say like limited a lot and provided a lot of barriers, but they also made me double down in my passion and commitment to making those not be barriers for other people.

And even having not experienced a lot of racism myself, that absolutely doesn't mean that I don't care about that either, of course I do. And really making sure that I use that privilege I have to make more space for my friends who were being highly discriminated against, that made it all more important for us to show up very authentically and to say that's not fair. I had to struggle through that, and I don't want the next generation to have to. We need to make a change like this. This doesn't make sense, it's not the best for science, it's not the best for people.

Anoodth: Yeah, all of that resonates. And, Sam, you were talking a little bit around this hidden curriculum. I wonder if you could speak a little bit more to some of those unspoken invisible barriers that women and gender diverse folks face in STEM learning environments.

Samantha: Yeah, there's a lot to this hidden curriculum. We think of the knowing of the field, the things that you'll only get from having done it before. And if you have someone you could rely on in your family who's been through it, they can tell you like, hey, the insider scoop, the insider knowledge. And that's some of those, for sure, that I would say are really relevant. One, first and foremost, safety. There's a lot – there's a

huge lack of safety for women and anyone in a marginalized gender. And I'll just say Canadian stats for students attending a post-secondary institution, almost one in seven – is that correct? – one in seven were sexually assaulted in a post-secondary setting. So safety is paramount, and that's certainly beyond a barrier that a lot of people will say.

And it's compounded for people with disabilities, compounded for people who are racialized, compounded for Indigenous women, compounded for transgender and gender-diverse people, gender-non-conforming people, queer femmes, especially experience higher levels of sexual harassment in the workplace and on campus settings. So, first and foremost, that safety is absolutely there. And we've often heard of like a leaky pipeline of why we have fewer – even though we have a lot of women, for example, interested in science at an early age, we don't see a lot of CEOs of science companies, or even a lot of people winning the top science prizes who are women.

And so they say, "Oh, it's a leaky pipeline, where did we lose the woman?" You didn't lose them, the pipeline's broken. It was not a safe space, there was no room for them to stay because it was literally unsafe. And so they're not leaking out, they're being forced out by violence, so I would say that's the top of mind. Some other ones would be biases in hiring. There have been many studies showing biases of different kinds on applications when it's a woman's name, and really clever study designs to show that it was a bias if you like tweak the name and all that. An example that I had, I was asked to sit on a hiring committee for someone to become the chair of a department. And someone actually said in that meeting – I was a student representative – someone said, "Oh, will she be able to handle this new position because she just had kids." And luckily another older woman who had kids herself shot that down immediately and was like, "That is up to her family to decide how they're going to manage that. She's applied to this position, that means that she is capable." Like, "She'll manage her own home life. That's not our business." So that's, again, just like the biases in hiring are very much there.

Anoodth: Yeah, I really appreciate your analysis around the workplace, because I think often around that concept of that leaky pipeline, right, that pipeline is broken, it was broken to begin with. And so often there's this huge emphasis on recruitment to STEM, right. There's all these conversations around how do we bring more women to STEM, how do we bring more gender diverse folks to STEM, but we never ask like what are the conditions we're creating so they actually stay, right.

Samantha: A hundred percent.

Anoodth: Are we talking enough about retention, are we talking enough about safety. And often those are really missed in the conversation.

Samantha: Yeah. I really struggle with the recruitment of more women in science and, "Oh, OK, we need more diversity in science." I'm like, "OK, I want that too, however, it may not be safe for a queer woman or a trans woman to be in a lot of science environments so can we talk about that and actually make a change, and then we can let you check the box that you have a diverse department."

Anoodth: Absolutely. So when it comes to making a change then, what role do you think that mentors and supervisors play in building safer and more inclusive learning spaces?

Samantha: There's a lot, and I do want to put the onus on the people with more power and privilege to continue to advocate. There's a mentality that, "Well I did it so you will too, and you'll have to suffer through it as well," and that just doesn't make sense and isn't right, and it isn't conducive to the best learning environment for anyone, and a most productive environment. There are a lot of microaggressions, for example. These are the small things, bigger changes are needed, but on the small scale, like the number of times I was told not to use uptalk, or vocal fry, or say the word, like, it's just not relevant. So the small ways that we perpetuate misogyny and, I think, condescension towards women, it feeds into this bitter bigger cycle, so let's watch those small, mindful things.

Thinking about safety and having processes in place, especially because a lot of – in higher education – actually on a lot of university campuses in general, social activities surround alcohol, and that's often not very safe for a lot of people. And so I think just being mindful of, OK, if we're having a social and there's alcohol, how are we ensuring safety. What do we have in place for people to report if anything happens? How seriously do we take that, and how do we escalate that, how do we offer support. None of that exists. I went to many overnight retreats with my department, many overnight conferences, there was no accountability, and everyone's just like sharing a room or rooming next to each other, and lots of alcohol involved. Luckily, I was OK in those scenarios, but there were people who weren't.

I would also say be mindful of the backlash effect. This is something that people often talked about where someone might look at a department and say, "Oh, OK, well in the life sciences there's 50% women so there must be gender equality in that department. That's not an issue anymore." And in fact it's been shown, in a few different settings, that in places where it seems like there's gender equality because there's like equal numbers, or it feels like there have been some

gains made, sometimes people even retaliate further, and people hate to see an empowered woman. So sometimes, in fact, that leads to more targeting and more violence against women in those contexts. And that's in part why a lot of queer women experience higher rates of violence because they're often seen as like, "Oh wait, you seem really progressive, and like you're really wanting to change things and make things better for women." No that's like a small part of it according to some of the research.

So really just trying to think of are we having those inaccurate views of safety here, do we have safety measures in place, how am I perpetuating it in the everyday, and have I actually even asked people what kind of support they need, that's a great place to start.

Anoodth: Yes. Yes. So I know you touched on this, and if you're comfortable sharing, have you had to navigate harmful behaviour or unsafe dynamics in your own STEM journey, and how did you handle it? And maybe what are some supports you wish you had?

Samantha: I mean I can't think of a time that I've ever left my house as a woman and not thought about safety. I was reflecting on that, like we often – it's just always there, that I don't think we even realize that we're constantly evaluating every time we pass someone on the street. And it's not just true for women, it's also true for trans people who don't feel that they're safe, or that they might be clocked and treated differently especially in the current climate. For me, personally, I would say I've been relatively lucky. I have been in some very questionable situations, but luckily I always had an ally nearby. A few where – again, mostly at conferences, because these are overnight events, lots of people, lots of strangers, and you're supposed to network. So especially towards the end of my graduate career I was really trying to network, and really I'm very social. I would go up and talk to someone. I arranged lunches so that I could ask people about their careers and their companies, it's what you're supposed to do, and some people took advantage of that.

And I'd say, "Let's grab lunch. I'd love to ask you what it's like to work at this place." And suddenly we're at lunch in this place across the city, and I realized I'm alone with this man, and I'm realizing now he's not taking this as a work meeting, he's taking this differently. The support that I had that was great was a lab member who was a very tall white man, and he was very supportive. And he would often keep an eye on me and literally just come to my side and be like, "Hey Sam, we need you over here," and no one questioned him. And so I was really lucky to have that person there keeping an eye out for me. Not everyone has that, and so thank you, Ken. And I would say just in general lots of misogyny, even very publicly, about me. Especially as I was starting science communication and building a bit of a profile, I had a few hit

pieces put out on me, sadly by other women. And through COVID, a lot of anti-science sentiment led to me being targeted in a lot of different ways and received a lot of threats, some death threats even. And I would say like the support of a community, and someone to go to, and someone to even just be there when I was in a potentially unsafe setting, made a huge, huge difference for me.

Anoodth: Yeah, I'm so sorry that happened to you, and I also appreciate you sharing so candidly. I think there's so few of us who've spoken out against gender-based violence, sexual harassment, who haven't been on the receiving end of some sort of backlash. But, Sam, yeah, I really want to shift a little bit into your work as a science communicator, because my nieces are obsessed with your videos.

Samantha: Aw, thank you.

Anoodth: And I mean I'm a huge fan as well. Tell me a little bit, Sam, around – you know, as a science communicator, how can the media really help shift public understanding of sexual harassment in STEM?

Samantha: So there's a lot of things that we can do, the easiest thing in media – the easiest place to start – is to platform more women, more trans people, more gender non-conforming people, more Two-Spirit people. Think about the sources in any article – not just an article about women, or an article about gender diversity, or an article about sexual harassment. In all things that you're working on, think about the representation in the experts that you're citing because it really helps to platform people with different perspectives, and then it helps that person in turn to build credibility in their career. And that will have a long, long, long-term impact in giving them power to navigate things better and make better changes. So that's a very easy start; it's your job to find good sources, please keep in mind the diversity there.

But that's just the beginning. I would say giving the due light when these stories do come to surface, and having accountability. Like are you now interviewing someone who has a claim against them and is in the midst of a lawsuit, and that doesn't – you're platforming now someone who is potentially a predator. That happens more than you would think. And I think so just having accountability too, and amplifying the stories because it is so hard for someone to speak out against violence and sexual harassment in the workplace. And there have been many cases in STEM at high profile universities and high profile scientists that I only found out about through whisper networks, and they were not being publicized the way that they should have been in at least major science media outlets. So please, these are important stories, and they should be covered like other important stories are.

Anoodth: I really appreciate that, Sam. Yeah, I think a lot about these whisper networks. It's often the first time we hear about instances of sexual harassment and sexual violence, and thinking about what we need to do to create safer spaces, and better reporting and disclosure mechanisms for people to come forward with their stories and their experiences of sexual violence. I know, Sam, you've done a ton to support young people who might be interested in a STEM career, what would you say to a young person who really loves science but is really unsure about whether they'll be safe or supported in STEM?

Samantha: I would say I love that you love science, and I'm so happy to hear that. And don't let anyone dim that love and that light for science because it truly is an incredible field. But your concerns about safety and support are very valid, unfortunately they might be applicable anywhere, like in general. Like science is not super unique, it reflects the same imbalances and injustices we see in other parts of our society. So instead, what I would focus on is, is science particularly bad. I don't think so. I think the need in any field is there's a need to find your communities. For me, honestly, there were some in person, but I connected through other graduate students online through Instagram, other people who were sharing their science journeys.

And we had this DM group, and then it spiralled into a larger group where we all talked with one another about the things we were experiencing, the challenges. And it was so helpful, because instead of just looking at, OK, well this is how the University of Toronto does things, this is how things happen in Ontario, I got to hear about the success people had over at Berkeley from my friends who were part of those movements. And then there were a few concrete examples where they told me how they were doing things and I was like, "Oh, I'm going to do it that way." Why reinvent the wheel, why waste your energy when people have already figured it out. So really reaching out can make such a difference, so please do that, find your communities. And I also have to say, trust your instincts. You're a science oriented person, so you may think your feelings don't matter as much as logic and data. That is not true.

Your instincts are very important, and sometimes our brain works faster than we can process things, so we may not be conscious of why we're feeling a certain way. So that does not make a feeling illogical; do not ignore your gut feeling, there is a basis to it biologically, and just pay attention to those instincts.

Anoodth: Amazing. Thanks so much, Sam. I know that there are a couple of questions in the chat, so maybe I'll ask one or two more before we head to our Q&A. And, yeah, one of my last questions for you is, Sam, tell me what gives you hope about the next generation of scientists and how

they're shaping their respective fields and really pushing for safer spaces?

Samantha: I do have a lot of hope. You will often find me calling things out and, yes, I have a lot of critiques as I think we should, and as I think it is my job as someone who's gone through the process, but I have so much hope. I'm seeing so many conversations of men stepping up which is great. I can call out my friend Trace Dominguez who's always – he has a son, and is always talking about things that they're teaching their child, and I love to see that. Onus on partners to support – Emily Calandrelli is such a champion of that. She's a space communicator, and she'll always talk about the things her husband does, and the different support she's gotten from people in her life. That makes me very happy to see.

I'm also seeing a lot of young people in general just being much more open in exploring gender diversity. And, for me, I really think we will never see an end to misogyny and discrimination against women if we're only thinking in the binary. And seeing so many young people just really exploring and having nuanced conversations, and redefining gender in new ways I think is critical to true gender liberation, freedom, and safety. And so I am so inspired by this interrogation of gender, and including from scientists, and a lot of scientists stepping up to combat the pseudoscience people are trying to use to justify being transphobic. Science very much supports that there's a gender and sex beyond a binary, and to see scientists being willing to speak on that, even when it's not a particularly safe time, makes me feel very hopeful that we really can make a difference and change.

Anoodth: Absolutely. So, Sam, what are some of the conversations that you're seeing now, maybe, that weren't happening five or 10 years ago?

Samantha: Yeah, I think some of those, like especially the openness and willingness to defend, to speak out against pseudoscience that's trying to be transphobic. Like that's something that I don't think has become as mainstream, and hasn't been a mainstream conversation until the last, yeah, maybe five to 10 years, and so I'm really happy to see that. And something else that I think, someone getting their due flowers that I do want to call out, is a woman named Amanda Nguyen. She has a memoir named Saving Five, talking about how as she was doing her astrophysics degree and trying to pursue her dream of becoming an astronaut, she unfortunately was raped at the age of 22. And she took that horrific experience, and while having to process the trauma of all that she went on to advocate for better policies across the US to make to make rape kits not be thrown out after six months, and to actually be held for the statute of limitations.

She's created a powerful grassroots movement, Rise, and she's done a lot mostly in the US, but next week she's finally fulfilling this big dream she's had of going to space on a space flight that's all crewed by women. It's a commercial space flight, but I'm so excited for her, that after all that she's been through she's finally able to have those conversations and still achieve her STEM dreams. That's not something I think a lot of people can say, historically people who've had to go through that and have spoken up about it really get limited, and she's an example that that should not be the case.

Anoodth: That is a really beautiful example to end off on. When's that flight happening?

Samantha: April 14th. Gail King is on it. A bunch of other people. It comes at a time when a lot of women scientists are facing immense challenges, especially in the US, and I think getting fired, and not getting funding, and cuts to a lot of programs of support. So it's a very weird time, but it's nice to have something to celebrate nonetheless.

Anoodth: Absolutely. Absolutely. Sam, I think that leads us really nicely into some of the Q&A that our attendees have placed in the chat. So the first one I'll take is how has the current political social climate impacted some of the topics you decide to cover, and how do you deal with some of the backlash that you've received?

Samantha: Yeah, I mean for me, my role, science is very political. Science is influenced by politics, and science influences politics. Everything's political and science is not separate from that. I try to be nonpartisan because I want everyone, regardless of their political affiliations, to be able to pursue science. However, when someone in any party is being blatantly misogynistic, homophobic, transphobic, racist, and there's something of science they're trying to use to justify that – I mean that's very much true with transphobia – there I feel I must speak out. As a scientist it is my duty and my job to speak out. As a science communicator I have the skills and privilege to, and so, for me, I do want to respond to those things. I do want to give people the science backed arguments to shut down misinformation that they're seeing, especially when it's so harmful and violent to someone's wellbeing.

For sure there's backlash, for sure there are trolls in my comments every single day, and sometimes it's scary and there are threats that I receive, and I have to monitor that and take it very seriously. But there are steps I take for safety, and I think again, at this stage in my career, it is really my job to do that. I was speaking with a really young scientist who she just started her grad career, and she's very passionate about communication and all of these topics, and wants to speak out more. But she's doing her research abroad, and it doesn't feel safe, and she

doesn't know if she can. And what I told her is that, "You can do it, it doesn't have to be all at once, and it doesn't have to all be on your shoulders. We can take turns, we can do it together. I'll cover this, you cover that." Or, "You're still in a very vulnerable position, maybe it's not your …" – like, "Maybe it's not right, right now, for you to have to speak up and put yourself at risk. Maybe I can take that on for you." And so that's how I'm thinking about things these days is how can we help one another because the burden is too much alone.

Anoodth: I really appreciate the thoughtfulness.

Samantha: Thanks.

Anoodth: I think we've got a couple more questions for you. When I was asked how do we address the fear or resistance that some educators and institutions might have towards changing established systems that don't serve everyone equally? That's a big question.

Samantha: Yeah, sorry, can you say the first part again?

Anoodth: Yeah. How do we address the fear or resistance that educators institutions have towards changing the established system?

Samantha: Yeah, I would say it's – I've been there, and I understand the fear and resistance, especially where it might feel like your job's on the line or you aren't at the top of the totem pole, you don't have the power. That's very valid, like you – at the end of the day we live in a system where like you need to be employed to support yourself and your family. I get that. I would say sometimes in the past I found success being strategic. I found success thinking of like well what's the thing that this person cares about that I can angle towards so that they'll have to care. So in graduate school, a lot of the advocacy I did, I knew that my department cared most about students finishing on time because that was attractive for recruiting new students which is how they make their money.

So I always try to reframe arguments of like, "And this will help students stay on track to be successful and publish, and that will be great for retention or for recruitment." So finding that tweak. And I think that's where organizations like Courage to Act can come in as well, because you all have done a lot of the research and a lot of the – collected all of that background information that we can then have in our arsenal to be like, "OK, here's the stats," so they can't shut that down, "Here's how I'm going to frame it," because that's what they care about, and then maybe I need to get some numbers behind me and not make it seem like I'm the only one who cares about this, but maybe I need to pull in some allies to be like, "All right, dude, I need you to speak up on this too."

Anoodth: Absolutely, that strategic angle and also strategic language, using language that they care about. It's interesting when we speak to senior administrators, or heads of different organizations, Sam, it's amazing, we frame things in terms of risk and it's –

Samantha: There you go.

Samantha: Exactly.

Anoodth: And we need the attention.

Samantha: Exactly. And that's what needs to be done. Like, unfortunately, people don't care for the same reasons that you might care, but at the end of the day I'm like, "I just need to get this done," so I will do it, I'll say it.

Anoodth: Yeah. And then I appreciate what you said earlier too, just about not feeling like we have to do this work alone.

Samantha: Yeah.

Anoodth: There's a community, and lots of people who care very deeply about people's safety, and it's mobilizing together.

Samantha: Mm-hmm. Yeah.

Anoodth: I know Rebecca has a really good question for you as well. You say certain fields in STEM tend to have more communal values leading to a greater emphasis on collaboration and more pro-social exchanges. What can we do to translate some of these values to other fields in STEM that may have a greater emphasis on individual achievement and dominance to create spaces that are more inclusive, per se, for women and gender diverse peoples?

Samantha: Oh, Rebecca, that's an amazing question. It's so real. It's challenging. I think the hardest part is if you think about the top prizes in science, the Nobel Prize, we just had the breakthrough prize the last weekend, this past weekend the Gairdner Awards, which are an amazing Canadian awards, they're often – in part by necessity – awarded to individuals, and a lot of science isn't done that way. But we have this general culture of awarding individuals, having one talking head, having that one person will win the prize. And, as you say, not all fields of science operate that way. And in fact it's often grad students and postdocs working long hours who make the research possible, and then the head of the lab who has earned it gets all the credit.

It really requires, I think, more stories about that community effort, and they're just really hard to tell. I try all the time. It's so hard to say because it was this person connecting with this person who helped in

this way and that way, but I do think we need more of those stories. And one thing that I think everyone in science can do is make sure to give that credit, and to make sure to go back to the core principle of science which is consensus. So often, and especially in the pandemic, we had individual scientists speaking on topics publicly, giving their opinion, which was great, and I mean sometimes it was super helpful. But it's a bit antithetical to the process of science, consensus is what we need to be emphasizing, and so I think more and more we need to be going back to, "I think this because of my expertise in this and this, and it reflects what the majority of science is saying, and consensus towards this."

And I think as much as we can relate back to that core principle of consensus and group, instead of individuals and individual studies, that can be very helpful. And I think showing how different people's unique perspectives and ideas contributed can kind of – it's a bit distanced, but I think having that part of the story included is how you can show that everyone's unique voice and perspective was actually useful, and giving that due credit where it's needed.

Anoodth: Thanks so much, Sam. I think we have a couple more questions, so Rebecca has said, "It's so refreshing to hear you talk about gender diversity and the trans community. You've given me hope today, so thank you so much, Sam. Can I ask what you draw on when you so passionately talk about the LGBTQIA2S community and other people in the community who inspire you?"

Samantha: Oh, so many. I have the privilege of working on an event I was a co-founder for called Science is a Drag, and we take scientists and put them in drag for the first time, and it's a really fun community event where you're learning about science but through the very fun medium of drag. And so I think everyone who participates in that, and who's willing to put on a wig or draw a beard on their face, or do whatever form of drag is affirming to them to share science really, really inspire me. And working on that is the thing that energizes me in my work. But also there are lots of scientists – oh, there's too many – another notable one is Ben Barres. The late Ben Barres, who was a trans neuroscientist, who even wrote a book about the experience and was so influential. And for me, it's that I think being queer and trans, it really is – and the way that we've advocated in the trans and queer community over the years for Pride, for example, the flag, OK. Even the way that has evolved over the years is very much in line with the ethos of science.

You make a new observation. You see, "Ah, this could be a bit better," you refine your theory. Same thing. The Pride flag has changed like every few years, and that's a beautiful thing because they realized, "Oh hey, we should highlight intersex people more." "Oh we should highlight Black trans people more." "We should do this more." There's

a lot of similarities in the way the queer and trans communities are – 2SLGBTQI+ communities organize and redefine, and are always pushing for a better understanding, a more reflective understanding of our world. That's what science should be doing. And so for me, they go hand in hand, they just make a lot of sense, and so I think we draw inspiration from each other in that way. And also queer and trans communities are like the best at public health, and community advocacy, and grassroots initiatives. So, for me, I'm like these are leaders that we need to be paying attention to, and it aligns with my values to very loudly proclaim that.

Anoodth: Amazing. Thanks so much, Sam. So there's another question in the chat which I might be able to answer, which is what resources and opportunities can we expect from the At the Root project? Great question. So there are a number of educational professional development opportunities we've got planned in store, and all very exciting. You can look forward to our learning lab series which will be launching this summer. Folks will have the opportunity to participate in six different learning labs, all focused on the issue of addressing sexual harassment in STEM experiential learning. So we'll walk you through different parts like how do begin to even understand and frame and contextualize this issue, how do we develop effective protocols and policies, how do we generate buy-in from employers and industry who are taking students into these experiential learning opportunities. So lots, lots there, and more to come on our website.

And, yeah, I think we'll be putting out four different resources which you can also ask people for. We're really, really excited about a number of evidence-based resources that will specifically meet the needs of STEM programs, workplaces, campuses, and communities. The one we've been working on right now is called Responding to Sexual Harassment in Experiential Learning, and it's a toolkit to support staff and faculty at post-secondary institutions to better understand really what sexual harassment is, what it looks like for students participating in STEM experiential learning. And it'll really walk you through how to respond when a student discloses about violence in their placement.

A second piece we're really keen on is the Building a Protocol to Respond to Sexual Harassment and Violence in STEM Experiential Learning resources. So it'll help individuals and organizations develop protocols in the context of STEM experiential learning. So it's really a very cool roadmap to build out a protocol for responding when a student shares that they've been affected by sexual harassment or violence in their STEM learning position. And the third piece that we're putting out is policy and legislative recommendations. So we are updating our set of policy and legislative recommendations to protect students from sexual harassment in STEM experiential learning, and it'll cover lots of

different aspects of experiential learning. And it's a really neat tool that's for post-secondary institutions, provincial, and territorial governments, employers, and experiential learning providers. So lots coming down the pipeline there, and we're really excited to share them with you. So if you subscribe to our newsletter you'll be the first to hear about all of these opportunities.

So I hope I've answered that question as comprehensively as I can. But I think there are maybe, for you, Sam, two more questions in the chat if you're open to it.

Samantha: Sounds great.

Anoodth: Yeah. One is a big question for you, which is how do we begin to engage men and boys to end gender-based violence?

Samantha: It's a big question, but it's a great one, and I think it is critical. And fortunately I think we're seeing a little bit more engagement lately which makes me very happy. And I think part of it, again, having to appeal with what will men and boys care about. Well it affects them. Gender-based violence often happens because of gender-based discrimination and these imbalances – lack of gender justice and gender liberation. So if we take a step back, like what's causing gender-based violence? OK, well there's a lot of gender inequality and lack of gender liberation. Well that affects men and boys, and everyone, frankly. And so I think we sometimes get very entrenched in the way we talk about things to make it very – like rightly so, I understand why we do that. However, I think taking a step back sometimes in realizing well what are the cause of these things, and how is everyone impacted in a way they may not realize could be a helpful angle to help more people step up.

There are many ways that men are disadvantaged because of the patriarchy, and the patriarchy upholds gender-based violence. And so we can achieve two things with that, one, by absolving this one major problem. So that would be a great strategy. And I also think there's a bigger problem that we're facing with – there's a political agenda against gender liberation, and so that is a very organized movement that is very hard to combat. But a lot of men – if you are even just logging into TikTok for the first time, but you've said that you're a man, you are automatically being pushed certain topics. And there's a very well established pipeline to push young boys especially towards far right ideology that perpetuates gender-based discrimination and violence.

And so there's a bigger problem there, that we have systems in place that are highly organized that are pushing them in the opposite direction. So we also need to target those things and try to be just as

organized in not letting people fall for those traps, and speaking up against the things that don't make sense, the logical fallacies that are there, so that they don't fall trap and victim to these things that are ultimately aren't good for them either.

Anoodth: Thank you so, so much, Sam, for that. I wonder if there's any more questions, folks. I think we've got about one or two more minutes, so we welcome any last questions. And just while we're waiting – oh, I think there is a question. It's like do you have any advice to overcome resistance in the context of non-gender neutral language environments. I'm not too sure what they mean.

Samantha: Yeah, I'd love to hear more from this person if they want to add to it. But from my guess of what we're getting to here, is there's a lot of gendered language, and perhaps this is particularly for French, if I'm guessing. And I know there are some ways that people are trying to make French a little less gendered. We have some French experts on the call who might who understand this better than I do, but there are ways that people are changing the way that we spell and pronounce things in French to be less gendered. And then broadly too, even in science, there are a lot of things we talk about, even talking about women's health.

I'm often an advocate of pushing to using more gender inclusive language, like, "What are we actually talking about there? Are we talking about reproductive health? Are we talking about uterine health? Are we talking about cervical cancer? Are we talking about oogenesis and the health of someone's reproductive gametes or something? Let's be more specific. Are we talking about sperm? Are we talking about this?" So I really push for actually better scientific language instead of relying on gender terms, because that helps us expand our understanding of the thing, be more accurate, and it also makes it more inclusive. So even just saying like breast cancer screening, some people say breast and chest, and I think that helps us be better about our language in that it's more accurate and also more inclusive so that everyone can have access to the education and to the care that they need.

Anoodth: Amazing. That was a powerful note to end off on, Sam. I really appreciate you. This has been such a powerful and generative conversation, and I know there'll be more questions coming your way. But, Aubrianna, I think we are near time, so I'm going to turn this back to you.

Samantha: Thank you so much for having me.

Anoodth: Oh, thank you, Sam.

Aubrianna: Thank you so much for that wonderful conversation, it was so enlightening to hear more about your experiences, Sam, and I personally learned a ton today. So I'm just going to pull back up our final slide here so you can all get in touch as needed. So, yeah, like I mentioned, a huge thank you to Science Sam for sharing your knowledge and expertise with us today. It's been amazing to hear more about the work that you're doing and the ways that you make science more accessible for everyone. Like Anoodth said, her nieces are obsessed. We're all big fans over here, so it's been great to have you. I also want to take a moment to thank our attendees for joining us and sharing in this conversation today. We appreciate and take inspiration from your commitment to addressing gender equity in STEM. We're really lucky to be able to work alongside each and every one of you, so thank you so much for joining us.

And a kind reminder to please complete the evaluation form which will be linked in the chat, and sign up for our newsletter which you can see the link here on the slide, and that'll keep you in the loop about all our future events and learning opportunities. Take care everyone. Thank you. Bye for now.

Anoodth: Thanks, Aubrianna. Thanks Sam. And thank you to the Courage to Act foundation team who put this all together.

Samantha: Thank you.

[End of recorded material 00:54:28]