RICK 0:10
Welcome to the HEADS UP! Community Mental Health Podcast. Join our host Jo de Vries with the Fresh Outlook Foundation, as she combines science with storytelling to explore a variety of mental health issues with people from all walks of life. Stay tuned!

JO 0:32
Hey, Jo here! Thanks for joining me and my two guests as we delve into the topic of depression and the key link between lived experience and emerging science. Our first guest is an engaging young man who draws on his personal story to guide his work as a community mental health educator in British Columbia. The second is a Canadian researcher in psychiatry, who's on the leading edge of depression studies locally, nationally, and globally. Combined, their insights, passions, and dedication bring hope that depression won't always be the leading cause of mental illness around the world. But before we meet these amazing folks, I'd like to hear more about depression from my researcher, Rick. Thanks for doing this, so we all have a basic understanding before digging in deeper with our guests.

RICK 1:27
Happy to help, Jo.

JO 1:28
So, what's the official word on depression?

RICK 1:31
The American Psychiatric Association has a resource called the Diagnostic and Statistical Manual of Mental Disorders. The fifth version is called DSM-5. It's used by medical professionals around the world to diagnose different mental illnesses, including depression. In short, the manual describes depression as a common and serious mood disorder that causes persistent feelings of sadness and loss of interest in life. Also called clinical depression, or major depressive disorder (MDD for short), depression negatively affects how you feel, think, and act, and can lead to a variety of emotional and physical problems.

JO 2:16
What are the key symptoms?

RICK 2:18
They range from mild to severe, and include depressed mood or feelings of overwhelming sadness, worthlessness or guilt, unexplainable crying, loss of energy or increased fatigue, loss of interest in activities once enjoyed, difficulty thinking concentrating or making decisions, changes in appetite or sleep, and thoughts of death or suicide. To be diagnosed with depression, a person must exhibit five of the key symptoms for at least two weeks. One of those symptoms should be either depressed mood or loss of interest or pleasure.

JO 3:00
What's the key takeaway here?

RICK 3:02
It's that depression is a real illness, and one with fatal outcomes for people who don't get help and die by suicide. On the brighter side, depression is one of the most treatable mental illnesses. In fact, experts say that between 80 and 90% of people with depression eventually respond well to treatment.

JO 3:24
Great info Rick, thanks. My first guest is one of those fortunate folks who responded well to treatment. Daniel Honke is an amazing young man who's using his lived experience to help others who are struggling with depression. After being diagnosed with depression and anxiety four years ago, Daniel began treatment with medication, and then sought out various skill building courses that taught him how to cope with his condition. He is now the regional educator facilitator in Kelowna, BC for the BC Schizophrenia Society, and volunteers for the Canadian Mental Health Association. Hello, Daniel, and thanks so much for joining us!

DANIEL 4:09
Hey, Joanne, glad to be here.

JO 4:11
So, let's start with your story.

DANIEL 4:13
Sure thing... so I got involved with the mental health system, so to speak, when I started manifesting symptoms of both depression and anxiety at the beginning end of seventh grade when I just transferred schools. And it was almost something that I definitely didn't see coming. Let's put it that way. It was almost as if every day I was kind of going around with an anchor in the middle of my chest, and I felt that every time I was out in public, whether it be either in school or just even just in the community, I felt very drained.

And this was something that I felt like I couldn't talk to my parents about or anyone that I really cared for, simply because I didn't want to be that person... a quote, unquote "burden" to anyone. And coupled with the fact that I had a really rough family life, and our family was not doing all that well, it just seemed like for me, the best way to cope was to try and knuckle down and deal with each day as I could, without getting too bogged down with moment to moment. But eventually, at one point, when I went into high school, I started resorting to self harm as a means of coping. And it was almost as if every day for me was like, I felt as if I was a third person passenger to myself, as in, I could recognize other people were speaking to me, however, I never felt really present there.

So, I mean, for me, self harm was a means of trying to bridge that mental disconnect from the physical and helping to some extent record helping me recognize that I was still here, that I was still human, that I was not that I was disappearing, right, because that's what it felt like. And as each day blended in with the next, my self harming obviously didn't help, my depression and anxiety just got worse and worse. And it culminated in me having a lot of very, I guess, acute mental breakdowns in my classes. After which point my teachers finally took notice about what I was going through and sat me down. And naturally, I didn't try and confide in them anything too specific, I was trying to avoid as much concentration on what I was going through as possible. But I tried to placate their concerns by sort of coming up with any excuse I could to just get people off my case and getting get back to how I'd been living before.

So, I did manage to seek out, it was sort of placed upon me that I seek out therapy, but it was more so in the form of counseling, which I think helped me to some extent, alleviate some of the pessimism that I was going through in high school, but also that coupled with the fact that I did manage to make a very good connection with one of my high school teachers. And what I got from both of those resources was, you know, "Daniel, everything will be good after high school, you know, you can leave all the superficial nonsense behind you and life will open up to you." And that's what I kind of hung on to up until I graduated. And then I decided to go directly into college, trying to go for an Associate of Arts degree majoring in psychology. And I thought perfect, this is my time to sort of reinvent myself. And all this time, I had not found any good way of coping with my struggles as it pertained to both depression and anxiety.

So, once I got into college, it all kind of just blew back in in full force. And this time, I didn't really have much of a structure that I had to follow, everything was sort of up to my own discretion. So, I ended up not going to classes, I dropped out, I became essentially almost a shut-in for five years. My hygiene was just bottom of the barrel, my day-to-day kind of blended together. And it was a really dark time for me; I had no motivation to do anything. And I spent pretty much all my time in my room, my sleep schedules completely off kilter, and I wasn't eating very well.

And it was it was really tough for me, on top of that, to maintain my friendships simply because I was not able to articulate to my existing friend group at the time, that it was nothing personal on their part. But I was not able to connect with other people for prolonged periods of time, simply because of how it exhausted me in the process. And my parents had no idea how to help me out during that time. I mean, they tried negotiating with me, they tried being empathetic, they tried to be coercive, but none of those strategies seem to work or stick simply because I just wasn't receptive to anything that they particularly had to bring before me.

So eventually, you know, they got to the end of their rope and my dad one day, went to my family doctor and said, "Look, my son is in his room all the time. He doesn't do anything. He has no job, you know, he's essentially just living, barely even living each day, almost like a zombie." And so, the doctor said, "Okay, have him come see me, we'll figure something out." And I still remember the day that my

mother came up to me and said, "Daniel, you have a doctor's appointment," and I kind of at that point, had rolled my eyes and said, "Okay, here we go." This is another initiative they're trying to get me to play along with, but I said, "I have nothing to lose realistically." So, I went to that doctor's appointment and that was for me the tip... the turning point in which I had a very frank conversation with a third party that was removed from my family situation. And he asked me very basic questions about my sleep cycle, my day-to-day, how I'm living, how I feel. And it was after I answered all those questions honestly, because I knew I was very receptive to the notion that yes, I was not living a good life, I was living a very unhealthy life. So, after I answered all those questions, as best I could, he gave me the diagnosis of generalized anxiety and major depressive disorder. And I thought, okay, I don't know what to do with this. I can see the diagnosis, but I don't understand how to respond to this. So, he just started me off with some basic antidepressants on a low dose. And, I was very wary of the idea of taking medications. But I thought, again, I had nothing to lose, I have literally nowhere to go but up.

But within the first week or two, after taking those medications, I noticed an immediate shift in my, I guess you could say, physical symptoms... that anchor that I described before, that I used to carry with me in public places... I could still feel that anchor to some extent, but that the weight of it didn't feel as bothersome as it did before. It almost felt like I was cushioned to some extent. So, I thought, okay, there must be something to this. But I knew that medications were not the complete picture, that I needed some kind of extraneous help to help to prop it up. So, there was a day where I went to WorkBC and I said, "Okay, do you guys have any inkling as to where I can go for resources and counseling or therapy, and they pointed me to the BC Schizophrenia Society. And I kind of scratched my head for a second, I thought, well, I'm dealing with depression, anxiety, but okay, I'm willing to give it a shot. And I started with the BCSS by taking some of the courses they offer for those people that live with mental illness, which are peer taught. And, I mean, the education that I got from both the Bridges Program, which is again, a course that is designed to help people who live with mental illness, articulate what their illness is, what medications are supposed to do, as well as communication strategies that they can employ, to work with their doctor, and come up with relapse prevention strategies.

And that was all good for me. I think it was a good toolbox that I was able to create for myself. But the main thing that I got out of it was that I was finally in an environment where I wasn't alone, where I could see other people that were struggling with similar illnesses and/or similar pains that I had been going through, but we're all from various different walks of life. And so, from there, I thought, Okay, I'm going to keep this going. And so, I eventually was asked to become a facilitator for those courses. I then became a peer mentor at the Canadian Mental Health Association, where I mentored those who are also struggling with mental health challenges. I went on to become an executive board member at the BCSS, [and] culminating in March, I became the new regional educator for the Kelowna region for BCSS. So, in the span of three years, I've come quite a long way, had some definite ups and downs, but I'm happy to be where I am now. And I'm hoping that I can utilize my experience in connecting with those who perhaps are still struggling and show them that there's a light at the end of the tunnel for them if they if they are at least receptive to it.

JO 13:42
Daniel, that's such an amazing story. And you're so articulate, congratulations. It's very exciting to hear that.

DANIEL 13:50
Thank you.

JO 13:51
Your worst bout of depression was the five years you spent isolated in your home. For those of us who may not understand what that was, like, can you explain what a day looked like for you during that time?

DANIEL 14:07
I almost hesitate to use the word "day" because for me at that time, there was no day and night there, it was just you know waking up and going to sleep, I would have times where I would stay up until around five or six in the morning, and then just sleep up until three in the afternoon. And that would be my cycle. And the process basically entailed me connecting with social media or watching YouTube videos or playing video games.

And highlighting the social media aspect, that would be almost my window to the outside world where I would see all my peers excelling or doing well in terms of their careers or relationships. And I would kind of use that as an indicator that I myself was not worth anything compared to the peers that I had grown up with and almost felt myself to be equal to in the times of high school. They were excelling whereas I was staying still. And honestly, the day-to-day life was just I think a lot of it was just self resentment that was just manifesting in. Again, me not connecting with anyone, barely even talking to my parents. And having just a hard time finding a place of stability for myself, even though I didn't really have any extraneous pressures. I would say that, objectively, my living situation was pretty good. But internally, my mental health was just turning my day-to-day and into an absolute pigsty, I guess you could call it that.

JO 15:44
What would your family members say about the impact of that particular five-year span on their lives?

DANIEL 15:53
Oh, they felt like they couldn't even talk to me. They felt as if whenever they tried to reach out to me and asked how I was doing, or trying to put any kind of indicator out on me trying to think about my future, I would beat them with immediate either irritation, or just barely even a response on my part. And that was tough for them. Because I could see, especially looking back now, that they truly wanted to help. But they didn't know how; they had no idea how to connect with me, how to help me. I remember days that my dad would come and talk to me, he said, "Daniel, I don't know how to help

you." And my response to him would always be, "You know, I don't know what you can do, either." So, we were both caught in this position where we really had no idea how to move forward. And any discussion that we did have turned out to be just [as] unfruitful, simply because I was not receptive to any strategy going forward. So, it was it was tough for them, for sure. They very much wanted to help but just didn't have the tools to do it.

JO 16:53
Depression often coexists with other mental health challenges. You talked about your experience with both acute anxiety and major depression, which was worse for you and why?

DANIEL 17:06
That's such a tough question. So, within the context of the five years that I was kind of living inside my room, so to speak, I would say my depression was probably the worst one, simply because it sort of disabled me from doing anything or pursuing any kind of initiative that I might have even been minorly receptive to. The anxiety was very, very bad without the medications, I mean, but that was more when I was in a situation that my anxiety would be triggered, in which was bad. But when I was living just in my room, and at home, and day to day not doing anything and going anywhere, my depression would stop me from even pursuing that initiative. And, therefore, it just kept me in a static space without any kind of hope, or desire to even get out of my situation. So, I definitely say the depression was the worst part of the two.

JO 18:04
So, recognizing that everyone's wants and needs are unique, what is the role of medication in your treatment plan? And then we'll talk about other parts of your holistic healing plan.

DANIEL 18:21
So, for me, medications have always and will always be a tool. It is not the be all and end all. I think it is a good point to start with people to get that motivation to seek treatment or extra treatment. But I don't believe that medication on its own is the answer. I do you believe you have to follow it up with other supports, so to speak.

JO 18:43
What about medical oversight... regularly meeting with your doctor and your therapist, for example?

DANIEL 18:51
In the earliest stages of my taking the medications, I would have regular meetings with my doctor. The meetings with my doctor were good in order to establish that working relationship of how I wanted my future to look like, and what ways in which we could progress to that point. But I would say that, in terms of the medications, the biggest resource or person that I can engage with to talk about medications, were definitely my pharmacists, because they had the whole basis on what the side effects I was struggling with were, and how to manage them effectively. So, the doctor coupled with

the pharmacy, both of those supports together form the oversight I think was necessary in order to deal or cope with the medications in both the good and bad.

JO 19:41
What about therapy or counseling?

DANIEL 19:44
I engaged with therapy, actually, quite recently. So, this was after I'd gone through all my supports. This was after I had actually gone through a little stint in the hospital following a suicide attempt. And that therapy was along the lines of emotion regulation therapy. So, allowing me to recognize what my feelings were and how to accurately describe and live through them rather than pushing them away, which was my go-to strategy for a long time. And so, my therapists that I've gone to see at Interior health have definitely helped me re-evaluate the kind of person that I am and how I see myself. And again, it has just been that extra resource that helps prop up all the other resources that I've used along the way. So definitely very, very helpful.

JO 20:31
What about your family and support from the community?

DANIEL 20:35
My mom and sister, they both took the Strengthen Families Together program at the BCSS, which is similar to the educational component that I got from my end as a person living with mental illness. But this one was geared more towards the family members, and how family members can communicate and support their loved one who lives with a mental illness. And from their perspective, they were able to finally understand a little bit more about what I was going through. And we were able to put up a bit more, I guess, more resilient and longer lasting boundaries that we could recognize from each other's perspective. And we had a little bit more newfound respect for each other, because we could alleviate that feeling of walking on eggshells that we had described before. So now we were able to have more engaging conversations with each other.

And in terms of the community, I was able to become a peer mentor simply because of my involvement with the Canadian Mental Health Association. And in doing that, I was able to get a deeper understanding of the various backgrounds that people come from. And that sense of community helps me again feel like what I was struggling with was not simply my struggle to deal with alone, that there were other people walking along the same path, and that we're all here to help each other along that road to recovery.

JO 21:54
I too, have a history of acute anxiety and moderate depression. And I find that lifestyle choices such as sleep, and nutrition and exercise are just critical. Is that the same for you?

DANIEL 22:09
Oh, yeah, for sure. So even recently, I mean, with this whole COVID thing, I found that my sleep schedule, especially was having was having some dips in it. And it was tough for me to maintain that structure. But once I've recently now gotten back to trying to regain some semblance of structure, I found that that is absolutely critical. I think it's critical in general for anyone. But I think when you're living with a mental illness, I think it's absolutely critical to maintain a good structure, good eating habits, good sleep habits, and employing some sort of exercise in the process as well.

JO 22:43
I know that volunteering is a big one for you as well.

DANIEL 22:46
Oh, yeah, definitely. My volunteering definitely maintains that virtue that I think, to some extent, I don't see enough of especially, I guess, in my generation... that feeling of gratitude that we have so much to be thankful for in our society, and we tend to overlook it and focus too much on the negatives. Not to say that that isn't important, of course, it's important, but I think you have to balance that out with that feeling that giving back to the community gives you when you volunteer time for any organization, knowing that you're making some kind of positive impact to people in the community. I think it is fantastic... keeping yourself on a path towards recovery. Absolutely.

JO 23:33
So, how's your depression been healed? Or do you still have episodes that impact your life at home and work? Are you better at recognizing that slide when it begins?

DANIEL 23:46
So, definitely better at recognizing the slide when things are breaking down because of the training that I've had. So, I recognize the early warning signs that pop up every so often. And my family is now very aware of those as well. So, we have a double team perspective on when things are breaking down until we can catch it. I would say that my depression definitely hasn't; healed I deal with it every day, to some extent. And it's just become a part of my normal, what I'm dealing with, but I'm much better off now than I was five years ago. Yes, I still struggle with my depression. But it's at a point where it's manageable enough... I can live a semi-productive life and not have it become my defining feature. I can still define myself along the lines of the work that I do and not the illness that I carry.

JO 24:38
So, what are the most important things you would say to someone who's struggling with depression and primarily people who are reluctant to get help or just too afraid to get help?

DANIEL 24:52
Yeah, that's a very tough question, because I mean, the old saying goes, you can lead a horse to water, but you can't force it to drink. But I would say that if anyone out there is struggling with depression in

some way, I think a good frank talk with your doctor...family doctor... is a good starting point. And after that, I would also engage with some kind of community support, whether it be through either Canadian Mental Health Association, BCSS, The Foundry, whatever it is, whatever age group you fall into, wherever you can go in which you can find other people that are also, or have also struggled with, similar things as you and, in turn, get some insight as to how you can tackle your own mental health struggles. And I think the biggest thing is, make sure to be patient with yourself, don't try to aim for the moon. Try to take it one step at a time, find small victories as they come up. Don't try to overwhelm yourself, do things one step at a time, and be patient with yourself.

JO 26:01
And what would you say to someone who loves and or lives with a person with depression, and specifically, when should that person intervene?

DANIEL 26:12
I think it goes back to patience, personally, and being able to listen, and I do. I know that word gets thrown around quite a lot, the term "listening," but I do believe it is a very essential skill that people have to cultivate. And it can be extremely difficult, especially as a family member, if you're trying to listen to your loved one, they already have perhaps some sort of preconceived notion of how you're going to react. So, they may not be as receptive to conversation as you would like. But I think that only introduces the fact that you have to be all the more, I guess, resilient, or all the more receptive to how your loved one is feeling. And when you're catching them on a good day, try introducing a conversation that is calming enough or not overly stressful for that person who might be struggling with depression, and find ways and common points of common ground in which they might be a little bit more receptive to treatment.

And when things get to a point where you start noticing things like self harm, drug use, or worse, when you or their lives are in danger, you definitely have to just either call 911 emergency services, or even call what we have here in the Okanagan, the community response team, which go out into the community and help address mental health crises as they manifest before that person gets to a point where they go into full blown either psychosis or they find themselves in the hospital. So, knowing what your emergency resources are is a big step, I think in preventing a lot of tragic and preventable situations from happening.

JO 27:50
Daniel, thank you so much for sharing your story and for being so vulnerable. I'll bring you back into the conversation once I've picked our next guest's amazing brain.

DANIEL 28:02
Sounds good. Thank you.

JO 28:08

Dr. Andy Greenshaw is a professor of psychiatry and neuroscience at the University of Alberta, with broad interests in biological psychiatry and behavioral neuroscience. His research also includes digital mental health, and the use of machine learning and data mining to predict diagnosis and treatment responses in mental disorders. Because that intro just scratches the surface of Dr. Greenshaw's accomplishments and affiliations, I encourage you to check out this episode's show notes at freshoutlookfoundation.org. Welcome, Andy, and thanks so much for taking the time to be here.

ANDY 28:50
It's great to be here Jo, and thanks for the invitation.

JO 28:53
Also, a big shout out to the Mood Disorder Society of Canada, who connected me with Andy and provided many of the statistics we're sharing with you during this episode. Before we get into your research, Andy, I'd like to ask you a few questions that will build on the information shared by Rick. First, what are the causes or risk factors for depression?

ANDY 29:20
I'm happy to answer those questions. But the first thing I want to say is thank you to Daniel for his description of his journey and answering those questions. Every time I listen to someone with lived experience, I learn more. And that dialogue is really important, which is why I was very excited to participate today.

So, you asked about causes and risk factors for depression. So, we know a lot in general, but we know relatively little in terms of specifics. What people would really like to know for example, what gene or genes are responsible for predisposition. Towards depression, what it is about people's biochemistry of brain chemistry, personality, and a whole host of things, a list of things we can touch on. One is genetics. So, for mental disorders, we have some good indications of candidate genes. But we have no clear linkage of genes for depression, or even schizophrenia that would allow you to go, "Okay, here's the link," because these disorders are quite complex. And one of the things that comes up in the richness of listening to somebody's story like Daniel's is that people symptom features, and their journeys are all very different. They have some common points. And those common points are reflected in the diagnostic criteria for disorders. But in fact, people are all different. And it's a complex pastiche of different things.

One of the clear things about depression is that we really do understand that early experience, and early environments, are important in giving rise to a person's journey. So, we can say for depression, with confidence, for example, that if you have a mom that's depressed, you have a higher likelihood of being depressed. If you have adverse early childhood experience, you're more likely to suffer from depression, or some other mental disorder. Daniel mentioned anxiety and depression. And one of the things that we note in early childhood is anxiety is a key issue that sometimes blossoms into other mental health problems. So, you'd rarely see depression without any anxiety. And if you think about

the early vulnerable period of childhood, where people are anxious, this can give rise to a lack of control and worry, hopelessness. And that can flow into some form or patterns of depression. There's some very clear evidence about adverse childhood experience leading to mental illness and mental disorders, and particularly depression.

So, there are two lines of evidence. I'd point to one of my friends, Dr. Michael Meaney, who's at McGill and also at the University of Singapore, [who] has been doing pioneering work for many years, looking at an animal model of maternal deprivation. He had an ingenious idea looking at mice that are not really like humans, but in some ways have very common elements. So, among mice and rats, when they give birth to the young, they lick their young and pay attention to the young to stimulate them. And so maternal behavior in these rodents, high rates of licking for neonatal animals, give rise to better health. And so, Michael and his colleagues have done a wonderful series of experiments looking at the influence of this very early experience. And the differential effects of the rat and mice mothers that pay a lot of attention to the young or don't pay attention to the young on the outcomes, and they found that, in fact, the early experience of these rodents gives rise to a change in hormonal function related to stress responses. This is what we call the HPA axis, the hypothalamic pituitary adrenal axis, and relates to circulating levels of steroids, and actions of those steroids, on the brain. And what happens is if you have adverse childhood experience or you are neglected as a young person, you become less reactive in terms of your stress responses, and that blunting of stress responses is related to differential behaviors that relate to predisposition to anxiety and depression. That laboratory observation has been translated quite well into human studies.

Another person I know, Vincent Sellitti, who works for Kaiser Permanente, he's an internal medicine specialist, became very interested in mental health correlates of physical health problems. Vincent noted that in many of the people that he dealt with, where they had physical health problems, they also had some mental health complaints. And so, we investigated the relationship between them and with other colleagues at Centers for Disease Control. They did a cohort study of people within the Kaiser Permanente health system initially, and they had quite a large sample about 37,000 people and they looked at their health care utilization. And their diagnoses in relation to a simple questionnaire about what had happened to them before the age of 12. So, adverse childhood experience scale, there were a few of them, but they relate to essentially neglect, bad emotional experiences, physical abuse, verbal abuse, sexual abuse, whether someone in the family has a mental illness or an addiction problem, whether there's been violence between parents, and they found that people with a significant ACE score, or adverse childhood experience score actually did not do very well, in terms of their health utilization. And one of the most interesting and clear observations for me from one of their early papers, is if you look at the prescription drug use for treatment of psychiatric disorders, and the prescriptions for drugs that are used as mood stabilizers or drugs to treat what we call bipolar disorder, was 17 times higher than the rate in people that did not have high adverse childhood experience. So, they have higher rates of antidepressant use, higher rates of mood stabilizer use, and so on. And projecting forward to that Kaiser Permanente sub-sample, there were increased risks for

cardiovascular disease, cancer, and some other chronic diseases that we don't consider to be clearly related to mental health.

So Sellitti and others have pointed the way in human population to a huge component of adverse early childhood experience giving rise to adverse effects. And these days, we think it's surprising looking back that we didn't, but we think increasingly about the links between physical and mental health. Because of course, there's this thing about, you know, the healthy mind and the healthy body go together, if you have a chronic physical disease, it's going to have an impact on your mental health. And listening to Daniel 's story, clearly, if you have chronic depression and anxiety, it's going to affect the way you live. It may lead you to neglect yourself physically in terms of your hygiene, your sleep, and so on. So increasingly, we're looking at the effects of adverse childhood experience, as a factor in determinants of health and disease, or something called healthy life trajectories.

ANDY 37:22
So, against that backdrop of adverse childhood experience, and hormonal disruption, this changes the way a person is built. You have your genetic building blocks, you have your early experience, and this gives rise to what we call your phenotype. So, the phenotype that arises from adverse conditions tends to have a higher possibility or higher risk for alcohol and drug abuse. Probably there's more stress partially related to difficulties with interpersonal relationships; having intimate relationships is much more difficult for someone who had difficult relationships. So as a child growing up, this leads to marginalization. The inability to perform in a conventional kind of way in a job environment gives rise to the risk of higher incidence of chronic diseases, and so on. So, we've gone from a simplistic position of going, "I wonder what the genes are that predispose us towards some mental health issues?" to looking at the whole enchilada, if you like, how do we raise a child.

You know the old adage about it takes a village to raise a child, I teach a course at the University of Alberta on Maternal Child and Adolescent Mental Health that talks about the mental health of pregnant women... how they would be treated, the impact of the mom's mental health on the birth process, bonding to the child in the beginning, how the child develops, how that goes forward, in terms of the environment that child is raised in. If you looked at the addiction literature, for example, for many years, people talked about the compromised babies of women who are addicts. Now, clearly, there are physiological and anatomical problems with some forms of substance misuse. Alcohol clearly is a problem because alcohol leads to developmental differences biologically, and you end up with fetal alcohol syndrome or fetal alcohol spectrum disorder. But the environment around the addicted parents, let's say people who are addicted to crack cocaine, how will they look after their child? And the more recent literature has really revealed that it's the early environment of children that's critically important. So rather than the child of an addicted person be written off, basically, and expect a great deal of care for biological reasons, because they're physically compromised... go beyond that, at least in the case of non alcohol related damage, and think about how these kids are raised and how much love and care they give them. So that the key actually, one of the great keys to mental health, is good treatment in childhood and good support. And this is an area that society has neglected for many

years. Adults have a larger voice, the impact of heart and lung disease or cancer is massive, compared to the perceived impact of how we raise our children. I mean, we could have a whole conversation on that. But I would say that some people are born with vulnerabilities. But those vulnerabilities are amplified tremendously by poor environments in childhood. And those of us who are born with really good foundation for health, if we're treated badly in childhood, things can go badly wrong.

The one area that it's really tremendously interesting is the area of resilience. So, there are some people who had a really difficult childhood and they do really well. And we are really interested in what sets those people apart from the people who don't do so well, and the people who are really challenged. And one of the things that we know from the work of several scholars is that if you have one really high-quality relationship when you're a child, when all else around you is bad, that can save the individual and promote resilience. But that's a long answer to your question.

JO 41:34
No, amazing information. So, Andy, what about being part of a marginalized community... being Indigenous or LGBTQ2? Does this predispose you to depression and other mental health challenges?

ANDY 41:49
That's a very interesting question. And it really depends on context, when you say a marginalized community, of course, that alerts us to, in the general community, this is a subgroup of people who are not considered the same, who may be treated differently. So, we use the word stigma in mental health, we use the word stigma in relation to racial discrimination, or gender discrimination, and so on. So, if you are somebody who is in a group, that is the other, and you don't have the same respect, the same access and the same resources, as the main population, already, you're offset in terms of some limitations in what's available to you. Indigenous life is really interesting. I'm part African, but not Indigenous from the Americas. And I have quite a few Indigenous friends. And we talk about the view of the general public about Indigenous people. And there are lots of stereotypes. I'm mentioning Indigenous, because here we are in Canada. And that's a very big part of the health issues and health inequities that we have. If you talk to Indigenous leaders, they'll point out that yes, there are some Indigenous communities that really struggle. But there are other Indigenous communities that are incredibly successful and do very well financially.

And in terms of health, the big issue about Indigenous life generally in Canada, you can think back to what we were just discussing about adverse childhood experience. So, if you learned from the work of my friend, Michael Meaney, that I mentioned on generations of mothers raising offspring, and in that case, it's a rodent model. But what happens is, the adverse childhood experience gives rise to genetic changes that are enduring. So, we didn't know this when I was a kid growing up. Genes were the building blocks that made animals, but our understanding of genetics has moved tremendously since those years and now we understand that genes are great modifiers for things, and one of the things that happens is related to what we call epigenetic change. So, if you are subject to some environmental stressor, let's take the negative side, it's possible this could be positive as well, but we only really see it

in the negative side. So, you're in a massive traumatic event. And then you're raising children. Your genes as a parent will be changed by that event. So, at the level of DNA, you have processes such as the methylation of cytosine, a nucleotide that is changed a little bit by the addition of carbon and some hydrogens, and that changes the way genes are transcribed. And you will pass that on to the next generation. So, your experiences have a kind of scar or imprint in your genes and the next generation of kids that are born, they have the disadvantage of that epigenetic change, typically it would be negative.

So, in the Michael Meaney experiments you have a perfectly functioning mother of rat pups. And you take those rat pups, and you have them raised by a mother that doesn't pay much attention. That adverse childhood experience or that adverse rat pup experience, if you like, will be passed on to the next generation of the offspring of those pups. We didn't really understand that before. But if you think about the whole experience of Indigenous people in North American colonization, which is not a pretty picture, when you look at the suppression of culture, the abuse of people and so on, that invariably has led to epigenetic changes that are negative. One of my colleagues at Dalhousie, Dr. Amy Bombay, is an Indigenous scholar who deals with epigenetic changes. And she's been studying the offspring of people who did or did not go to residential schools, and is finding really interesting results that differentiate those two groups. The idea being that residential schools could give rise to some epigenetic change through adverse environments.

JO 46:18
So, what that really says, when you talk about intergenerational harm, is that it's caused by biology as much as by sociology or psychology?

ANDY 46:28
Absolutely, you cannot take them apart. In some ways, you know, the hope of healing is in moving more towards a civil society that supports children well, and is not discriminatory, in which there is a real sense of equity in this new movement for equity, diversity, and inclusivity are talking about gender diversity and LGBTQ that has a number of other variants added to it, as well, in terms of Indigenous it will be two spirited and so on. Those people's lives, they can flourish in an environment in which there's more acceptance, but it takes time.

One of the big issues that's really difficult is the stigmatization of a community that's not doing well, when the offspring are not doing well. And it's almost like these people don't do well. Well, if your parents had a massive event that led to an epigenetic load that you inherited, it's not simply your choice. And that's part and parcel of what happens both living in a culturally oppressed group, and the responses to dealing with cultural oppression. So, drug and alcohol use is a critical example; [there are] very high rates of drug and alcohol use in some Indigenous communities. And some people would say, "Oh, that's just a characteristic of this community." But that's not true. There are some communities that do perfectly well and others that struggle, and turning to drug and alcohol use, yes, you could have a genetic predisposition, but it's also part of the coping strategy, an adverse one. And when that

becomes part of the character of the community, [it's] very difficult to just wave a magic wand and get rid of it. People have to be enabled to be successful. And that requires a key of self engagement and choices.

Now, Daniel, one of the things I really liked about your story is you were talking about how you reached out, and you connected with these activities. And clearly you found your calling in using your experience to help other people and to inform and educate people. And that is the kind of engagement that's really key to becoming healthy after going through those challenges for mental health conditions of various kinds, particularly depression, anxiety, and for substance misuse.

JO 48:58
So, Andy, can you step back a few decades and summarize the evolution of modern treatments for depression? We're going to be doing a whole podcast on the history of treatment for mental illness, going back to the days where they liked to drill holes in your brain. I'm glad we're past that, but for now can you give us a really brief history of, for example, medication therapy and brain stimulation therapies?

ANDY 49:31
I like to start with cultural attitudes. So, I think to my experiences around the world, and if you were to go to, I'll choose the northern aspect of a West African country, and you'd go to a small place with a marketplace in the center, you might find somebody wandering around, who would quite clearly be not functioning well. They would be different... their clothes would be not clean, their hair would be disheveled, and they'd be behaving in a strange way. We would probably come down with a possible diagnosis of psychosis. And in those communities, many of them are Islamic, they are faced with what is a classical idea, from my understanding, of "Oh, well, that person is special, that person has been touched by Allah, they're sacred, you have to be kind to them, you have to give them some support." And it's very difficult to support some people because I think elements of Daniel's story at one time where he really wanted to be left alone and wasn't really hopeful about things. But there's a big difference between that approach in a society, which is not adequate but at least extensively kind, and the approach where somebody is being a real nuisance in public, and you have to take or contain them, or they're an embarrassment to their family. And you have to somehow remove them from the public sight. And that typifies early European and, to some extent not so long ago, Asian views of mental illness. So, moving towards a position where we realize that people with mental illness are really not having a good time. They're really in an awful state, and they need kindness and compassion, and they need to be supported. Even if they can't work. Even if they seem to be behaving oddly, I think that's the first humanistic step towards really moving forward as a society to support people with mental illness.

And today, we still deal with stigma, how we think about, you mentioned mood disorders, and I'm thinking about Dr. David Goldston as a good friend of mine, and we talk about lived experience and the need to get away from stigma. Many of the positive institutions, including the ones that Daniel's

working with, are really keen to educate people that mental illness and addiction, they're not a choice. They are a circumstance that people find themselves in. So, the first key element moving forward is compassion. And I think the earliest that you can see is the closure of places like Bethlem Royal Hospital in London, or the old Maudsley Hospital both in London, where people would be basically chained up, and people would be given tourist tours to come and look at the crazy people. We didn't really have much that we could do to help severely mentally ill people in terms of the most difficult area, where you have people with untreated florid psychosis. But people are behaving in a what we consider a completely mad way, sometimes a danger to themselves, sometimes danger to others, very disorganized behavior.

We had the discovery of around the 1950s, there were some fairly primitive attempts to treat people. Electroconvulsive therapy (ECT), that's actually very effective, came out in the late 1930s with two Italians, Drs. Cerletti and Bini, who realized that electroconvulsive shock had a really calming effect on people. So, somebody who was behaving and uncontrollably bad way, if they had ECT would calm them down, they'd be disoriented, but they'd be kind of more manageable. And we've learned since then, that ECT is quite effective for kind of resetting people although there are disorientation effects, some cognitive dysfunction that's transient, and some memory loss that's transient.

Moving forward to drugs in the early 1950s, that was the first major step forward. And in the case of antidepressants, it's really interesting. I can't remember the name of the French physician, but he was working on wards where people were being treated for tuberculosis, the terrible disease. We still have treatment resistant tuberculosis, basically having your lungs dissolved because of an infection and basically dying with not being able to breathe… horrible disease. So very depressing. And this young French clinician was working in a sanatorium that was looking after people with tuberculosis, and there were some new drugs they were trying. I think one of them was Iproniazid, and these are enzyme inhibitors. And this physician observed that the people on this drug actually seemed happier. He made that remarkable observation, took it out into the rest of the world, and he started testing it out on people who simply had depression, and he found out that it was effective in some people.

So, that serendipitous happy accident observation led to a whole line of research on new antidepressants, and these were originally what we call monoamine oxidase inhibitors. And the monoamines are the major transmitters that were identified and well characterized by the late 1960s for brain pathways. So, serotonin, the same thing that was the target for Prozac and some of the newer uptake blockers and dopamine and noradrenaline and adrenaline. So, these amines are all broken down by monoamine oxidase. And if you give a monoamine oxidase inhibitor, you increase the levels of these amines in the brain and quite crudely it was discovered that well, if you do this, you do get an improvement in mood, thinking about depression. And the biochemical analysis that flowed on from that gave rise to an understanding that these amine pathways may be important. And then we moved into a new era where people realize that perhaps serotonin was the key. A good friend of mine, Dr. Pierre Blier, who works now at the University of Ottawa, working with Dr. Claude De Montigny, at McGill at the time, they discovered a mechanism by which drugs that affect the serotonin system,

through a delayed effect, change the responsiveness of the brain and give rise to increase serotonin availability, which in many cases is correlated with an elevation of mood and [lifting] of depression.

So, that's an early set of discoveries. Around the 50s, we move forward to the refinement of drugs. And I'd say the most advances until the 90s, were really refining the drugs to improve their side-effect profile. And that applies to antipsychotics and antidepressant drugs. Drugs used for anxiety, it's a bit more of a complex story. But now, as we turn in past the first two decades of this century, we are making more advances around some other windows related to amino acids. And there is the excitatory amino acid glutamate with what we call NMDA (N-methyl-D-aspartate) receptors, and some of the NMDA antagonists are turning out to be very exciting as new antidepressants. And one of those is ketamine. A drug company just has licensed a variety of metabolites with an analogue of ketamine... esketamine, which is easier to use because ketamine had to be intravenously infused and still is, but esketamine can be taken intranasally perhaps orally, and this drug is really good in some cases for rapid effects. And my friend, has told me from his direct experience in his clinic, that ketamine is a remarkable drug for turning things around when somebody is dangerously and acutely suicidal. So, they come into hospital for an infusion, which is a slow longer-term infusion of the drug ketamine, and they start feeling better quite rapidly. It doesn't mean that when they go away, everything's fixed, they have to come back in for a top-up now and then. But in the absence of anything else that was that effective, the ketamine avenue of therapy is really interesting.

JO 58:28
So, is that an example of biological psychiatry, which is one of your major areas of interest?

ANDY 58:35
Yeah. Well, it's interesting, we tend to make these dichotomies, right, of kind of social... biological. I think from the conversation so far, it's obvious that these are really intertwined. But yes, the ultimate goal would be if we could find a magic bullet or a pill that we could just fix something, which would be great. And we look to the brain to try and do that. This kind of parlays into a brand-new area, which is computational psychiatry, that we've got into in the last ten years. We're using machine learning and leans into artificial intelligence. I'll take an example of depression, and we heard Daniel's story. So, depression manifests in two different ways. And the DSM-5 that was mentioned, and there are these diagnostic criteria. So, I'll describe two fictional patients for you, just to give you an idea of the heterogeneity or the differences among symptoms. So, let's say we have two young women and both of them are diagnosed with depression major depressive episode. One of them is very thin, underweight, agitated, can't sleep, very depressed mood, very suicidal. Another one is quite obese, very inactive, sleeps a lot, depressed mood. When you ask her about how she feels, she's very suicidal.

These are two very different people, they both come out with a classification of major depressive episode. And you try and treat them differently because you don't want to activate the agitated person with suicidal ideation, because they may act out and they may go and try and complete suicide. You do want to try and stimulate the person who's overweight and underactive and sleeping too much,

because you want them to engage more. But you can see a single diagnosis on the books does not describe the person. So, when you look at all of the labels that could describe any of us, essentially a huge array of things. We could have early childhood experience, a history of mental illness in the family, whether we have a drug or an alcohol problem, whether we're in a relationship, have been in a relationship, whether we have any children, how active we are, what are the levels of physiological measurements, how tall we are, how heavy we are, how's our cardiovascular health, you can end up with 1000s of labels. And it's impossible for anybody to look at those labels and pick out the cluster that accurately precisely characterizes some aspect of health. But we have computer programs that can do that.

So, in machine learning, you allow an algorithm which is built of machine code to munch across a data set and pick out data clusters of interest in terms of they're significantly related to each other. And you can do it in a data-driven way, where you're just asking the algorithm to find patterns. Or you can have an hypothesis about, "we think there's this relationship," and you can set the algorithm to see everything in relationship to some key factors. And in both of those cases, which we would call supervised and unsupervised machine learning, it's possible to get quite accurate predictions for diagnosis. In other words, I have a patient, is this patient depressed or not? The algorithm has a lot, compares it to a massive data set, and said, "yes, these features are features of depression." And more interesting is, what is the treatment that will be effective for helping this person with their depression? Will they respond or not? And we're sort of at the beginning of that, but we have data that show us that we can actually predict more accurately, more accurately than a physician, whether somebody will respond to an antidepressant drug, for example, or whether somebody will be treatment resistant.

JO 1:02:53
When do you think that that kind of diagnostic tool might be in common use?

ANDY 1:02:59
We live in interesting times, you know. Daniel mentioned COVID, and the difficulties of COVID. And we'd never want to talk about the upside of a pandemic, because that will be a terrible thing to do. But one of the things that has emerged of necessity is a move towards more digital things. It may seem a bit far removed from machine learning, but the time now that you can have a video or telephone consult with your doctor is absolutely common. Last year, we had video, we had teleconferencing in most health systems; they didn't do it in some American systems. It was mandated that physicians would email their patients because it's so convenient for the patients and cost effective. So, as we move towards an acceptance of more things digital, it makes sense that we will move to an acceptance of more things digital in terms of decision making. And psychiatry is one of the most complex areas because we're dealing with the most complex organ, the brain, in a way that neurology is complex, but we're dealing with the very basis of thought and emotion, which is at least marginally less of a problem than dealing with motor disorders or visual disorders and so on. So, the toughest and the wicked problems, I think, are in psychiatry.

So, if you were to look at neurology today, and I think back to a recent seminar last year at the University of Alberta, where a professor came from the Mayo Clinic who specializes in machine learning solutions, and it was very funny. It was like a game show. Robot says, "This is the diagnosis. What does the audience say?" The audience were mainly neurologists. The robot was right far more times than the neurologists were and in much less time.

So, there was something called Arterys, which was licensed by the FDA in the United States a few years ago for diagnosing cardiac function. And it arrived at a more accurate conclusion than the cardiologist in minutes, where the cardiologist would take at least an hour. So, for places where the outcome is really clear, there are examples of how machine learning has really transformed things. And, you know, if you want an accurate decision, nobody would reject a glucose tolerance test or, you know, glucose assessment for where you are, if you have diabetes, and you need insulin. In the same way, machine learning is much more complicated, but some of AI (artificial intelligence) solutions coming to market now are really effective, and clearly advantageous.

So, it's partly cultural, it's partly the development of the technology, I'd say, based on the progress of the last ten years. Being bold, I think within the next five years you'll start to see some AI functions in the psychiatrist's office, where some decisions will be made about diagnosis, and particularly [about] optimal treatment. This treatment decision making is quite hard, and the drugs used to treat depression and anxiety, for example... [with] depression, you may have to take a drug for a few weeks before you start to see some real relief. And there there's a trade off between how much patience does a person suffering from depression have? And how much confidence does the physician have?

The literature tells us that if the first choice of treatment is effective, the patient has a much better chance of recovery. If the first choice isn't effective, it's not just the patient, it's that choice. And then the history of going on to different drug choices. And, back in I think 1986, there's a classical paper from New York, with Donald Klein that said, 12 weeks is the optimal time for a trial for an antidepressant in a patient. So, imagine, if you have depression, you're really not doing well, and your doc says, "Try this, you'll have some side effects. At first, they're resolved in a week or two. You may not see any real benefit for three to four weeks, but hang in there, and we'll see what we can do." And that's not great. But in general, that's been as good as it could be. And we're pushing really hard to get more effective, more rapid treatments for these disorders.

JO 1:07:44
Well, I know you're the scientific director of the APEC Digital Hub for Mental Health, APEC meaning Asia Pacific Economic Corporation, that will ultimately serve the combined APEC population of 2.7 billion people in the Pacific Rim. And I know you have a big role to play in that. And I'm going to bring you back on a feature podcast to talk all about digital mental health because, for example, the story you told me about the chat bot being developed in China is just fascinating.

We'll bring Daniel back into the conversation. But first, I'd like to thank a major HEADS UP! sponsor, the Social Planning and Research Council of British Columbia, which is a leader in applied social research, social policy analysis, and community development approaches to social justice. Lorraine and her great team support the council's 16,000 members, and work with communities to build a just and healthy society for all, I can't thank you enough for your ongoing support.

So, at the peak of your depression, Daniel, you were smack dab in the middle of the age group most affected by suicidal ideation. You mentioned that you did have a suicide attempt. Have you had suicidal thoughts since then? And if so, what is your go-to plan.

DANIEL 1:09:11
When I had gotten into those thoughts of suicide, the thoughts could range from fleeting to getting to a point where I was starting to really contend with the fact that I did not want to live anymore. And during those moments, I would always picture in my mind the effects that my suicide would have on other people, and that helped ground me in the reality that I had something in my life worth living for. And that would be either in the form of my family and my community work, because I know that through those two avenues my existence still has meaning. And there's the more formal approach --- which is the techniques such as breathing and regulation of sleep and making sure that your day-to-day life is stable --- that does help stave off suicidal ideations. But I think on a grander scale and a more abstract level, finding value in your day-to-day life through actions that you put into the world, and seeing the effects of those actions, does help stave off the suicidal ideations. They still can come up [from] time to time, and I've definitely had them pop into my head every so often, but I'm still here. So, they obviously are fleeting. I'm glad that they remain fleeting, but I'm always receptive to when they appear and letting them have their time, but not again, define themselves as a route for me to take as a possible option, just letting them have their space, and then moving on from there.

JO 1:11:11
So, Andy, is research being undertaken to better understand suicidal ideation, and how it can best be diagnosed and treated?

ANDY 1:11:21
Yeah, it's actually a very thorny problem. And it's one of the things that worries mental health counselors and psychiatrists a lot. We started to do some work in machine learning in AI on suicide prediction, it's very complicated. We have some early successes, one of the problems is that suicide is a devastating phenomenon. But in many communities, it's quite a rare event. So, trying to do research on the characteristics of an event that's quite rare, it's difficult. When your kind of looking for a needle in a haystack, Daniel mentioned, you know, suicidal ideation and thinking about things. That is some big risk factor.

So, the biggest risk factor for suicide is a previous attempt. Apart from that, it's suicidal ideation. And that is a very varied phenomenon. We're not very good at predicting suicide. It was in reviewing the

literature recently, last year, I looked at a summary of analysis of suicides in England and Wales over a ten-year period. And of all of the people that had completed suicides in ten years in England and Wales, about 70% of them at their last clinical assessment had a rating of zero or low risk for suicide. So, 70% of the people who completed suicide were not really recognized by the system. It is a particularly big problem. It has massive effects on the people who remain.

And there is the problem of suicide contagion, particularly among kids. So, there are some northern Indigenous communities where people have had clusters of suicide happening, and that is particularly tragic and really difficult. It's coupled to depression, but it's not a general aspect of it, necessarily. There are people who are impulsive and suicidal, other people might be depressed and not suicidal at all. And we do understand something of the biology of it, because we know that when serotonin levels go low, this is a neurotransmitter affected by many antidepressants. These days, there's a correlate between a measure of low serotonin and suicide. And that's related to some extent, to impulsivity. If you have somebody who's suicidal, but not very energetic, the risk is lower. But if you have somebody who's really agitated and active and has suicidal ideation, the risk is higher. There's something called mixed mood states where people are depressed, but they're active and suicidal at the same time. And they're very difficult to manage, because these people are very high risk. It's a super important priority, especially for young people.

JO 1:14:14
So, inherent in your story, Daniel, and in your research, Andy, is the consideration of nature versus nurture. And I know from the interviews I've been doing lately, that that's a saying that just doesn't sit well with many people. But having said that, Daniel, do you think it was your heredity or your home life that set the stage for your experience with depression later on? Or was it a combination of both?

DANIEL 1:14:45
Well, definitely [a] combination. Andy talked about the prevalence of genetics in the manifestation of depressive symptoms as an example. And I know that after some time has passed now and our families become more open to talking about our challenges, not just mental health related within our family. I mean, as an example, my dad is from Germany... was born in Germany. His father fought in the Second World War. So, his side of the family has struggled a lot with, with issues regarding mental health, particularly as my grandfather fell into alcoholism. And my dad was abandoned as a child. So, there's a lot of baggage to unpack there. And I think to some extent, you can call it either, maybe genetics, something that I inherited from him in terms of the scars. But I do think to some extent, the effect of his childhood also affected how he parented or how he approached a family life. Even though he would say he wanted to be the complete opposite of his father, to some extent, part of his dad still manifested even today, we can still recognize that.

And my home life definitely played into that, especially when our family faced a lot of financial struggles. And on top of that, because I'm a first-generation immigrant, you know, my dad, again, is from Germany, my mom was born in Uganda and is from raised in the Seychelles, we came to Canada

with no pre-established roots, or connections made. And so, I remember always growing up that a lot of our struggles were very internalized. My parents never had any sounding board to voice their struggles or issues. So, they always turned to us kids for some sort of moral support. And that put a tremendous amount of pressure on my sister and I growing up because we were faced with issues and struggles that we were not equipped to handle. And that put me especially in a position where I said [to myself], "No, Daniel, no matter what happens, don't be a burden. Don't put more stress on your parents more than you have to and try to deal with everything yourself." So, I can only speak on the nurture aspect, because that is what I can observe. But I can definitely see how nature would play a factor into it as well.

JO 1:17:16
Well, and as we heard from Andy, previously, your father's experiences, could have changed his DNA, which would then have affected you genetically as well.

DANIEL 1:17:29
I was wondering, Andy, what the prevalence you can see is of that heredity of cross generational trauma, I guess, being inherited amongst communities or amongst children. If that, for example, if a family or a mom, mom and dad have adverse childhood experiences, what are the chances that their children will genetically be predisposed to seeking out adverse coping strategies when faced with life's challenges or life struggles?

ANDY 1:18:04
So that is a very interesting question. One of the issues is that everything's relative, Daniel. So, if you ask people about their childhood, going back, or if you look at their parents' childhood, going back, you will find adversity. And in some populations, so we talked about Indigenous North Americans, where there's a massive impact of cultural oppression and stigmatization marginalization for years, that is a massive impact. So, you can expect in the population, the signal-to-noise ratio is such that you should really be able to pick up those effects. In circumstances where people have had a difficult time, if you think historically how life has changed across generations, our lives today because of technology are a lot easier than they used to be. So, the stressors of dealing with daily life and the stresses of financial issues and so on, in some ways, is generally better.

Imagine living in a place or a time where there is no welfare state. So, if you're really having a difficult time, you and your family members may just be extinguished by the environment because you will, you could, starve to death or have no medical treatment. And we are all aware in the diversity of the world these days. There are places in which even in very civilized places, access to services is very little for people who don't have much money or don't have much support. That said, one of the hopeful things is that in populations where there has been a huge adverse experience, there are some very successful people. And so, "where does the resilience come from?" is another question I mentioned earlier. One of the things this speaks well to is this issue, it's not a simple answer, but its kind of maybe puts it more into a frame of reality. And complexity is, when I talk to people about what they inherited from their

parents, I use the analogy of Lego building blocks. And I say, you know, if you have a certain pattern of Lego blocks, you may be manifesting symptoms of schizophrenia, or depression or anxiety or autism. But there'll be other people that have similar building blocks to you, but they're not in the same configuration. So, you're related, they share some of the same characteristics, but they don't have that disease manifestation.

Looking at these internal characteristics of people, you know, the genetic makeup of someone is called the genotype, as you know, and the person that is built by those genes, and the environment is the phenotype. So, in psychiatry emerging in the last 20 years, there's a new concept of the endo phenotype. And that is, what are the specific nature/nurture characteristics that represent a functional building block, for, in this case, a mental illness. So, in relation to schizophrenia, there's the idea that people with psychosis may have a problem with information processing. And they may have a problem with adapting to stimuli.

And there's a very simple thing, I have a lot of fun in class with students doing this because I'm talking about this phenomenon. And then randomly, I clap my hands really loudly, and everybody jumps out of their seat. And then I clap my hands again, and they don't jump out of their seat. And I say that is the phenomenon of pre-pulse inhibition. So, if I give you a stimulus, you respond loudly, or highly, and then I give you the same stimulus later, you're used to it. So, you adapt. Well, in many people with psychoses, they have a deficit in that. So, they'll jump twice, be quite startled twice, whereas the average person will be startled once and then we'll go away. There are people who do not have any mental disease or mental illness characteristics that also have a pre-pulse inhibition deficit. And if you have a person who has a diagnosis of schizophrenia, and pre-pulse inhibition deficit, and you tested their relatives, you will likely find some of their relatives that had a pre-pulse inhibition deficit, but they don't have schizophrenia. So, there's an example of potentially one of the building blocks around sensory processing that can contribute to a disorder. And that's kind of nature/nurture blending these blocks together to build the person. It's a little bit of a complex concept, but it's the genes you have and how they're expressed.

You can have elements of things. I mean, one of the things about mental disorders are symptoms that we all recognize is that they're on a continuum. If you take the core symptom of depression, which is depressed mood, we all get sad sometimes. And we're all happy sometimes. Anxiety is a normal thing. So, some of us are anxious some of the time. Others are anxious a lot of the time, and it's where you are on that continuum that defines whether you're clinically affected by or not. So, you put together that whole blend of things. That's one of the reasons that psychiatry has these wicked questions, because we're trying to see what pushes the limits and how people can adapt. So, nature and nurture are twined inextricably.

JO 1:23:46
The interviews I've been doing lately with a variety of people, the topic of identity has come up every time, meaning that identity is such an important factor in how people are feeling about themselves,

and will respond moving forward. So, Daniel, talking about identity, about the way you felt about yourself when you were at the bottom of your depression, can you explain how you felt about yourself then, compared to how you feel about yourself now?

DANIEL 1:24:25
Back then, I would say that the way I defined myself was along a set of very unreasonable expectations that I would say I was trying to use to almost describe what I thought other people were like, and that created to some extent, a very distorted view of how I thought other people were. So, I use again social media as an example in which, since my five-year stint of being shut in for the most part, I've since learned that social media is not necessarily a window as much as it is a highlight reel of people's best moments. And it's important to understand that when you're trying to compare yourself to another person, you're probably not comparing yourself to the person as they are. You're comparing yourself to them as they are presenting themselves. So, at the time I found myself, as you know, thinking, because I did not have a career, because I did not have a job because, I was at home all the time, I thought myself to be literally just worthless. I thought I had nothing to offer. I thought because of the evidence that I was never engaging with anyone and was too afraid to pursue any risks of any nature. I was unworthy of any sort of praise or accolade that anyone put before me. And that's still to some extent, something I struggle with. I'm very reluctant when people try to foist praise onto me, because I feel like, unless I don't believe it myself, it's not real. So, there's certain things like that that still have persisted. And I'm still struggling to reckon with now, in the state I am and how far I've come.

I feel like now I have a renewed sense of, I would say, confidence. And I don't really like to use the word confidence. But perhaps competence, competence is probably the right word that I can describe and articulate what I'm feeling in a manner that hopefully makes sense and is true to what I am thinking on the inside. And that there's not a discrepancy between what I'm feeling in my head and what I'm trying to manifest outwardly towards other people. A really big thing that I've always wanted to do was be a competent and articulate speaker. And I remember in high school, that was one of the things that was worse, that was being able to articulate myself in a manner that didn't seem like I was rambling. And I think I've come far enough now where I can finally say, you know, I'm happy that I've achieved all these things. But I never want to stop growing, I'm always finding ways to seek out new challenges in a responsible manner, ones that are feasible, and still being able to recognize how far I've come and celebrate my achievements, and also being able to set myself up for new achievements in the future and not, and most importantly, not defining myself by the illness that I carry, rather than the work that I do within the community and how much impact I have on people's lives going forward.

JO 1:27:46
Now, Andy, what does the research say about the importance of a positive identity?

ANDY 1:27:53
Well, it's a pleasure to listen to Daniel, because as he talks about all of these successes, I'm going, "Check the box! Check the box!" You said something almost like implying that you are partially

successful in your activities, I see you as immensely successful in your activities, and exactly in the right place. I think it's really important for people to be able to engage and to be enabled to engage, to value what they have. And I think one of the attributes of a really well-developed civil society that we all would like to live in, is an inclusive environment in which we value what people have. And instead of being critical about people, in terms of what they can't do, trying to enable people to fulfill their potential.

One of the things about Canadian society that I liked, having moved from Europe, in terms of approaches to children generally, is the school's focus on peer support and can-do, and raising kids up and kids have rights. I think that is one of the great things. It's not that simple. I don't want to sound like apple pie and ice cream, but that's one of the key things about being in a healthy community. We're all interdependent. None of us can survive in the modern world without the other people that we rely on for all kinds of things. COVID has taught us that some of the people who are considered commonplace — that checkout operator, someone performing some function that doesn't require any great qualifications — is fundamentally important for our success. Integrate raising up of respect for people, and I think that is the secret sauce that's going to be most helpful in promoting mental health, particularly starting in childhood and in families.

JO 1:29:48
Okay, so let's bring this all to a finer point. Daniel, as a person who's experienced depression, and who's now helping other people with the disorder, what would you like to say to Andy that will inform and inspire his research?

DANIEL 1:30:06
Man, that's a tall order, I would say, if you're able to utilize the technology and the research that you have, and refine it in such a way that it looks appealing to those who perhaps, are wary of both not only the mental health system, but of mental health professionals, that will go a long way, I think in not only refining the research, but allowing a more collaborative effort between professionals, are conditions that work in the field. And workers, people that work on the front lines, introducing more people into the system. And in the long run, allowing people to garner more faith in the system, as we make it better. And I think that involves a lot of conversation. And I hope that in the future that that conversation piece is highlighted and strengthened in various collaborative efforts. So yeah, I would definitely say that collaboration and a good ear to what the credit community is feeling is a good step forward.

JO 1:31:18
Fabulous, Andy, as a research psychiatrist in the thick of global innovation, in the diagnosis and treatment of depression, what would you like Daniel and our listeners to know about your vision for the future of mental health?

ANDY 1:31:34

Wow, well, first, I'd like to thank Daniel for his statement, because I think he's absolutely spot on with the things that I and my colleagues believe. So mental health is everybody's business. And we need to collaborate with people with lived experience and their families. And look at how we can enable people to be successful. So, engaging with patients, patient advocacy, on an equitable playing field, [we used to think] somebody has to lead. But many of us believe that in horizontal leadership into lateral leadership in terms of everybody has a voice, and we have to move forward. And I think inclusivity is super important. Understanding what people are dealing with, and looking for innovative, accessible solutions is really important. So, I really like what you say, Daniel, I think we're on exactly the same page.

JO 1:32:36
You both mentioned collaboration. Given what you've heard from each other today, how can the nonprofit and academic sectors work better together to mobilize change?

DANIEL 1:32:49
I think from my own perspective, it almost comes down to not even just the collaboration between nonprofit and academic, but I think the understanding from higher up on the federal level, on the government level, to allow research to be done with funding that can help these conversations be deepened and strengthened. I think Andy talked about the discrepancy between how we treat mental illness and how we treat “physical” quote/unquote disabilities like diabetes and cancer, I think there should be a greater push and treating mental illness like a physical disease. And in order for that to happen, I think you have to allow a lot more funding to get injected into that field of research that would/can make these conversations happen more frequently, and to a higher level of articulation between both the nonprofit sector and the academics that can inform each other on how the research can be done, and in what ways we can help each other in manifesting that larger social change to make mental illness a more accepting conversation piece, rather than defaulting to the stigmatization that has been so prevalent throughout many, many years.

JO 1:34:17
Andy?

ANDY 1:34:18
Yeah, I agree completely. I think we've turned a corner. I think that the Canadian Institute for Health Research is a good barometer on this. They are a major health funding agency federally, and they have put increasing demands on researchers to include things that relate to relevance and accountability. So, one of the more recent requirements is to have knowledge users on grants, which is wonderful. So, Dave Gallson from the Mood Disorders Society of Canada, for example, is on a number of our grants because Dave's organization with his colleagues, they have access to a large number of people who have experience, and we want to have those conversations. I think that the barriers have to come down, and we have to become better at communicating. And I think that's key for what Daniel is talking about. Because unless we can demonstrate the relevance of what we want to do in the

research context, why would anybody fund us? And not-for-profits are driven by the people who support them, and many of these people have connections to whatever the aim of the foundation or organization is, and so far, mental health, these are people whose families or they personally have been affected by this. So, relevance and accountability, super important. And of course, one must never forget that those of us in the research community are not different. If you took a group of 100 researchers and ask them their lived experience stories, you would find people with psychosis, depression, those who have children who have committed suicide, or their partners, all of those things. So, coming back to it... mental health is everybody's business. To get it right, we have to communicate effectively, and try and meet the needs of people who are dealing with these issues.

JO 1:36:18
So, in summary, I have five rapid fire questions for you both. In one word or sentence, what do you think about the following after what you've learned from each other? So, we'll start with the greatest challenge associated with depression. Daniel?

DANIEL 1:36:35
Motivation.

ANDY 1:36:37
Inclusivity.

JO 1:36:39
The greatest structural or bureaucratic barrier to curtailing depression?

ANDY 1:36:48
Recognition of how important it is to support children and the environment of children to avoid adverse childhood experience.

DANIEL 1:36:57
The desire to allow professionals the ability to hear what their patients are going through on a deeper level, and allowing them the ability to see their patients for a longer period of time in order to get a greater context on their situation.

JO 1:37:17
The biggest community benefit of curtailing depression?

DANIEL 1:37:26
We become, as Andy said, more interdependent. We recognize what the needs of our neighbors are, as well as defining what our needs are in the process, and building a better community because of that.

ANDY 1:37:44

Enabling people to fulfill their potential, and that has economic benefits. About ten years ago, it was estimated that depression cost the Canadian economy $51 billion a year. Today, that's probably $65 billion dollars. So, all the good things that could be done with those funds if we had a healthier population, and happier lives. people could have an amazing impact on Canada and the world.

JO 1:38:12
The experts predict that if we don't do anything significant now that those costs by 2030 will be more than $300 billion a year. So, what's the one thing we can do now to rapidly advanced depression diagnosis and treatment?

DANIEL 1:38:31
Allowing the use of early intervention to recognize when, especially in children, symptoms of mental illness become manifest, particularly when it comes to adverse childhood experiences. I think that goes a long way in staving off problems that child could experience as they become an adult, and a lot of hardship that could come as a result of again, psychotic episodes, decreasing their brain functioning as time goes on.

ANDY 1:39:05
I'm biased, I'm going to say that I think we have to take the barriers down around data access, we need to collect a lot of data on people's health, physical and mental health, and we need to apply advanced data solutions, to have better prediction for diagnosis and treatment that will really enable us to turn the corner and understand mental illness in ways we never understood people.

JO 1:39:30
And finally, your personal commitment to being the change we want to see in this field?

DANIEL 1:39:36
My personal commitment will be to always allow myself the ability to listen to those who are struggling. And making sure that those who are unaware of resources know of their existence. And making sure that those resources are accessible to those who live in all facets of society. And understanding the benefit of having us all come together as a community to tackle each other's problems as a group, rather than tackling it on our own.

ANDY 1:40:11
And from my perspective, I'm continuing on my mission for increasing capacity in terms of mental health, understanding and service with a diverse set of communities, including Indigenous people in Canada, and moving forward with training people and engaging in wonderful conversations like this, which I've really enjo
yed today.

JO 1:40:33

Thank you. And I promise to continue talking about depression and other mental health challenges in future episodes of the podcast. So, thank you, again, Daniel Honke and Dr. Andy Greenshaw for joining me, I'm just feeling like we're in such good hands, very capable and loving hands moving forward.

DANIEL 1:40:58
I've been happy to have this conversation. I think it's a very important one to have. And I'm appreciative that we're able to have it again across different levels of the same issue. But again, it's being targeted from various perspectives. I'll be sure to let my colleagues and friends know about this conversation. I'm hoping that this will spur on the initiative to address mental health concerns amongst greater levels of influence, and hopefully will allow this collaborative effort to deepen and reach a meaningful level that is affected throughout different parts of the community.

ANDY 1:41:39
I'm hoping for good things. And as you can imagine, I really appreciate the blend of science and storytelling. I've really enjoyed listening to Daniel and speaking to you both today. And I really appreciate the opportunity. It's a really important conversation and it's been a lot of fun, and I hope we can keep in touch.

DANIEL 1:41:59
Absolutely.

JO 1:42:01
To connect with Daniel, send an email to kelownaeducator@bcss.org. And for Andy, email andy.greenshaw@ualberta.ca. For more information and contact details, check out this episode's show notes at freshoutlookfoundation.org. I'd also like to give a plug to the Mood Disorder Society of Canada, which has plenty of information online@mdsc.ca.

And thank you for listening. If you enjoyed the podcast and would like to follow us on social media, visit facebook.com/FreshOutlookFoundation or twitter.com/FreshOutlook. For all other podcast episodes and associated show notes, visit freshoutlookfoundation.org.

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So, in closing, as Winnie the Pooh says, I'm so lucky to have something that makes saying goodbye so hard. So, instead, I'll say, "Be healthy, and let's connect again soon."