OREGON HEALTH & SCIENCE UNIVERSITY
ORAL HISTORY PROGRAM

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an interview with:

Hector Olvera Alvarez, Ph.D., P.E.

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by: Gregory Bratman, Ph.D.

Interviewee: Hector Olvera Alvarez
Interviewer: Gregory Bratman
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Bratman: Well, hello. My name is Gregory Bratman and I'm interviewing Dr. Hector Olvera Alvarez for the OHSU Oral History Program. It is June 27, 2023, and we're recording this oral history digitally. So hello, Hector. How are you?

Olvera Alvarez: Hey, how are you? Thank you for doing this.

Bratman: Thank you. Thank you for doing it, too. I'm really excited to speak with you. So let's maybe start with your early life. If you might describe your childhood and education a bit.

Olvera Alvarez: Yeah. Yeah, so I was born in Ciudad Juarez, Mexico, which is on the other side of El Paso, Texas. So I grew up in a very bicultural, almost, it's funny to say bicultural. Because that almost implies that there's actually these two cultures, and there's this sort of black and white border where you cross, and suddenly you feel more American or something. But the reality is that it's more of a gradient. And the border is this sort of mixture of the two cultures. It's not two but rather its own little border culture. It's a fascinating thing. I grew up watching both Mexican telenovelas and Saturday Night Live at the same time. Things like that. So that gives you culturally an idea of where I come from.

I went to my local elementary school. This tiny little thing. I remember being, I thought it was so big. And I drive by because my aunt still lives where she used to live, like two blocks away from there. And I drive by there and like oh my God, this is just so tiny. And it felt so big.

I have two older sisters. I have a whole bunch of cousins. In that neighborhood that I'm telling you, for most of my childhood we lived there. Or at least my grandmother lived there. So I just have these fond memories there.

I'm going to sort of accelerate to the education part, I guess. I studied civil engineering at the Universidad Autónoma de Ciudad Juarez, which is sort of the local city university. It's a public university. I picked civil engineering from a very pragmatic perspective. I've always been very curious. I have always loved to learn. And I remember in a retreat at church somebody said if you want to be happy, get paid to do what you love. And for me, that was learning. So I never was really that passionate about any specific field. Again, I thought about my career very pragmatically. And I always have made decisions when they're right in front of me. And at that moment, when I finally got the opportunity to go to college, I thought civil engineering was the biggest bang for my buck. And since my sisters were committed, had committed to me to pay for my tuition, I wanted to make sure that their investment was going to pay off. And I just thought civil engineering, it's a big career. It's math. Nobody can mess up math, right? So that's how I picked civil engineering. And then that led me to grad school later on in the United States. But yeah, that was sort of my experience.

And I loved civil engineering, by the way. I picked that. Once I was there, I just loved it. I love the idea of, well, the thing is that I don't know if you knew this, but civil engineering, the idea come from, is that years before, there was only one kind of engineering. And that was in the military, right? And these people were the people building bridges and all these things. And then

engineering moved out of the military. And we called it civil versus military. So at one point, all the engineering was civil.

Bratman: That's what I was going to ask you, because—well, I don't mean to cut you off. Go on.

Olvera Alvarez: No, no, no. Go ahead.

Bratman: Well, and this kind of goes into my next question, so I know that you care deeply about people. And I know that will kind of permeate our conversation today. And I'm just curious about just the civil engineering piece. Was there a part of that that was about people for you? In addition to the math and the smart investments and the pursuit, the intellectual pursuit, it involved?

5:14

Olvera Alvarez: No. To be completely honest, I think the part of me that civil engineering was fulfilling was an insecurity. For sure it was an insecurity. And I wanted to prove to myself that I was as smart as my mom thought I was. Because she'd been bragging about how smart her kid was like since I can remember. So you know, so I had these like really, am I that smart? So I guess, yeah. (laughs) I know, right? And engineering, I thought that's going to do it. So I got very good grades and I wanted to be the best in my class. And I always picked the hardest assignment or the hardest, you know. So within civil engineering, the hardest thing is going to be structural engineering. You know, designing skyscrapers or buildings or bridges or dams. And that was where I was going. Like that was my path. But it was fueled by this insecurity of trying to prove to myself how smart am I. And I just approach it like that.

Now, the people part of this, there's two sort of key things that happen here. One is that I took a bioethics class in high school that just put there a seed about, you know, humanity and society and the environment. Again, very different way of thinking.

And then after that, at the same time I was doing my bachelor's program, I was studying theology. Because I was considering becoming a Catholic priest at the time. So these are like two very contrasting worlds, right? Like completely—which I'm so glad that I was engaging at the same time. Because one didn't, one forced the other—it created a lot of tension, right? And both kept me grounded from completely diving into each other sort of ways of thinking, right? So the engineering always brought the theology back to wait a minute, but—and the theology always pushed engineering beyond the numbers. Like there has to be more meaning into all of it. So it was, now that I see it in retrospect, it was such a powerful period in my life. Because my mind had been juggling these two opposite directions.

But the point is that the theology and the philosophy really allowed me to think about people. And why are we here, and who we are, and all that stuff at the same time I'm doing engineering. And what happened toward the end, two things happened. I decided that I did not want to be a priest. But I also decided I didn't want to be an engineer.

Bratman: (laughs) Okay. So then how did all of that come together, and how'd you end up at a school of nursing, then?

Olvera Alvarez: Well, yeah, that's a big chapter of my life. The first thing is that I started to find a way from the hardcore engineering thing. And so the first opportunity that opened was, again, I was committed to going to grad school to do structural engineering. My senior year in college, I had the opportunity to volunteer one thousand hours of service in an environmental research lab. And you know, the bioethics course that I told you, you know, sort of allowed me to connect the environmental research and the environmental engineering to more of the theology and the philosophy stuff that I experienced during that period. So somehow, the bioethics was this tiny little seed that allowed me to find a connection between the engineering stuff and the philosophy and theology stuff.

So I said, you know, I'm going to go in environmental engineering. It's not going to completely fix my problem, my identity problem, but it's going to move me in the right direction.

So I did grad school. Did a master's in environmental engineering. And I did my PhD in environmental science and engineering. Now I'm still very insecure at the time. So I keep picking the hardest thing, right? In this case, air pollution, I thought it was like the hardest thing to do as an environmental engineer from a sort of mathematical perspective. Go ahead.

Bratman: Well, that's so interesting. Well, I want you to continue on the mathematical part. But on the air pollution part, was there also a part of your kind of lived experience that brought you to that interest as well? Had you experienced something with air pollution that brought you to it?

10:15

Olvera Alvarez: You know, this is going to come up a couple of times I'm pretty sure during this conversation. If you look at my career, the things that I'm interested in, my personal life pops up over and over. Now, consciously I cannot promise you that it didn't happen subconsciously. But consciously, it did not. It was not affected by my personal experience. And I'm going to highlight a couple of ones.

The first one, which is the one you're asking about, is the air pollution. And you know, I was at my grandmother's house, which is where we all hang out, I lived at her house at least three different periods during my life. Like when I was little, and then somewhere teenage. And then when I was in college, I was living with my grandmother. And my grandmother's house was right next to a heavy-duty diesel engine shop. So I was exposed to a lot of air pollution that now I know it's very toxic. And the air pollution part that I'm most interested in, and have been more interested in, is it is heavy-duty diesel engine exhaust and emission. And of course once I figure out the connection, my personal connection, it just made it more meaningful. But it wasn't the reason that I became interested originally.

The reason that I became interested in that originally is because El Paso and Juarez, it's a port of entry to each other's countries. And there's three bridges connecting those three cities. And the traffic. The crossing, the idea of crossing the bridge if you live in that region—which is, by the way, where I'm at right now. If you live here, crossing the bridge is a thing. Like everybody knows. Like we have a Facebook page to talk about how long is the line. Conversations, "Oh my God, the lines are four hours long today." I mean, crossing the border is a thing around here. So it's logical that somebody that is in environmental engineering, their mind just goes to the bridge. It's like oh my God, that has to be a big pollution and exposure

area. That's where my interest came from. Because it's just so—the idea's just so in front of you if you are from the border.

But again so, coming back to the other question, yeah, the path was, to environmental engineering, still sort of some of my inclination to study something really hard to sort of impress people with my work. But slowly moving towards areas of research and study that had a stronger human connection.

Bratman: It's interesting also because you mentioned bridges, and I know we'll get into this later in your work about environments and parts of the environment that are built for safety. And I see that as parts of the civil engineering piece, too. That maybe might have brought you to it in addition to the intellectual challenge.

So you got interested in the air pollution and environmental engineering. And then can you talk a little more about how that brought you into the school of nursing?

Olvera Alvarez: Oh, yeah. That was where we were going. Thank you for reminding me. So again, so I hope by now I have sort of introduced these two sort of developmental processes that I'm going through, right? One has to do with my own insecurities and all that stuff. And the other one is sort of an intension towards surveying and thinking about other people and how my work does that.

By the way, something that I haven't mentioned is that since I was in college, since I started college, I was also doing a lot of community service. And for all this time, all the four and a half years of college and the six years of graduate school, I'm heavily committed to community service. So I'm doing research at school, and learning, and air pollution and the environment. But then on my weekends and afternoons, I am volunteering at a nursing home or a psychiatric mental facility.

So, what I started to have problem with is my worlds being so disconnected. And again, this is sort of, I'm trying to bridge these two worlds of community service with my work. And again, that was the intention.

Now coming back to your original question, so I'm doing air pollution research. And the first thing I started to do was just do an inventory. You know, things like that. Just starting to learn the fundamentals of your area of research. In air pollution, you're quickly going to run into the fact that in most developed countries, the most socially vulnerable are the ones exposed to the worst air quality, right? And that's where all the lights in my head start to light up. Because finally here's an engineering part, and now here's a very human-centered perspective that connected. And that's where my path really starts, when I recognize that there was this injustice going on.

So I started thinking about, so that led me to start thinking about health disparities. Now this started during my grad school years. But I couldn't do anything about it until I graduated. So as soon as I graduated for my PhD, I had the opportunity to stay at U TEP, University of Texas in El Paso, which is where I got my graduate degrees from. And they had a Hispanic Health Disparities Research Center. This is a P20 grant from NIMHD. And at the time, the national institute of environmental health sciences had a pilot program which now has become a whole mechanism to fund environmental health research centers. And the center at UTEP had the opportunity to submit a proposal. So I get invited to contribute to the proposal. And again this center, the one that existed already at UTEP, was at the School of Nursing. And the PI was the dean of the School of Nursing.

So I go there. We contribute to the proposal that was led by some friends from sociology at the time that were also doing environmental health research. And we got the grant. And that opened the door for me to integrate myself not only with nursing but with health sciences in general.

I became good friends with the PI who was the dean. And he saw that I was really good at engaging with other people and creating research teams and collaborating. And I was a very strategic thinker. And he saw that when we were developing the proposal.

So he said to me, "Is there any chance you can help me engage more faculty in doing some of this work?"

And I said, "For sure. Let's find a way." So I start to try to do that. And then discover that you know what he and the school really needed was a plan. He had this approach of let's do this very organically. We tried that for a couple of months. And I said, "You know, you need to solve some structural problems that you have at the school. So you need to think strategically."

And he said, "Okay. Do you want to help me with that?" And here's where the engineering comes in. You know, engineering is a very strategic thinking field, right? We divide problems into tiny little things. And then we solve complicated problems by dividing them into simple little things to solve. We're trained to do that.

So I said sure. So using my engineering skills, I engage faculty from nursing. And together we develop a strategic plan for research for the school.

And I thought that was going to be it, you know? And himself and the provost were impressed with the plan. And they asked me to stay as director of research for the school so that I could oversee the execution of the plan. So I stumbled onto administration. I'm still growing as a scientist. Honestly I know as a fact I'm still growing. I mean, I'm still going through my own learning curve. And in some weird way, my training and my thinking and my experience about how research careers get deployed, it's probably more profound about my own science. I have spent so much time thinking about that that I feel very confident that I have a good idea of how that happens. Especially from graduates from programs that are not as privileged as the big R1 schools. Because that's where I came from. Yeah.

Bratman: Yeah. Can you talk a little bit more about that? What you see as the importance of that? Yeah.

20:16

Olvera Alvarez: Yeah, so again, I have, by now it's clear that I have these two career paths, right, after graduation. One, my own science and me as a scientist. And the other one, me as a research administrator. And they almost, again, the way I just told you, they almost started at the same time. I'm learning how to become a scientist and develop my own science. And then I'm learning how like from a mental cognitive perspective how that is happening as well. Because I just got engaged into doing that. And that thinking has evolved faster.

The other thing that happened is that around that time I get accepted into the JPB Environmental Health Fellowship. And that did, is that it exposed me to other people like me but with other realities and other backgrounds. So I'm looking at them not only as a fellow, somebody that hey, we're all here developing our own career programs, but I'm looking at them as a research administrator and saying okay, what are the needs that they have? Why do they have them? And also, what are the privileges that they have, given their backgrounds?

And I discover among myself and the few that—because you could see in the fellowship that some of them were more privileged than others, given their academic background. I mean, some of them came from a good, they graduated from Harvard, right? Where others, we did not. And I could see, I could see that disparity in our training and in our thinking.

So now I come back to UTEP with all these gaps identified. All this hidden curriculum identified. So, so the fellowship definitely helped me as a scientist. I think it helped me even more as a research administrator. Because it highlighted all the things that make a great scientist.

Bratman: What are those?

22:20

Olvera Alvarez: That's good. Well, the obvious one's mentorship, right? And good mentorship. And how good mentorship looks like. And you and I know this very long, yeah, of course is the science and how to write a proposal correctly and all that stuff. But more importantly is how the, behind the curtain, how does that look like?

I remember talking to the directors and my mentors. And all my questions to them were not about—well, most of them were not about the science. Were like when are you writing a paper? You have a teenager. When is the writing happening? Like all these other things.

And then of course also good mentors remain your mentors way after graduation, right? They advocate for you. They connect you. You get emails from them, "Hey, here's a job opportunity. Here's a grant opportunity that you will be competitive." So they keep looking after you. And that is more common in certain institutions versus others.

The other thing that they do, again, their networks are bigger, deeper and more impactful. So your mentors have more resources to share with you.

And then ultimately, and this is probably, I would think the most important one from my perspective for scientists that look like me, is that we all get, we all develop our mindset as scientists based on our early career circumstances. Just like kids, right? Our early childhood circumstances define the mindset for the rest of our lives. Well as scientists, that happens in grad school. And if you go to these Research 1 universities, you see how the life of very successful scientists looks like. It's way beyond forty hours a week. It's writing papers and grants at three AM. There's this reality that comes with it. And so now you graduate knowing, sadly, that's how it's going to happen.

When you go to these other programs, some of them, right, people are teaching more or doing other things. And the demand for research productivity's not the same. Such that the role modeling looks very different. So now you graduate thinking I have more time than the other person, right? Or your expectations are set.

And I work with a lot of early-career scientists. And it's really hard to explain to them, you know, this is how life looks for other scientists at those other schools. It's not me trying to squeeze productivity out of you. I'm just telling you based on your own goals, based on the things you want to achieve, the way that other people do it, it's not because there's more support over there. They're just putting in more hours.

Bratman: (laughs) Okay. Wow. Yeah. So—

Olvera Alvarez: You know, it's hard to say it sometimes. It's not always true. Obviously there's institutions that have more resources or not. And that's fine. But sometimes it is, the idea that you have on how do you become a successful scientist, that needs to be corrected.

Bratman: So, these were the kinds of things you were, I'm gathering in from our other conversations, kind of being exposed to and learning about and getting integrated into from the fellowship, right? The JPB Fellowship.

Olvera Alvarez: Yeah.

Bratman: And so you were bringing those things back to UTEP with you, right? And to the things you were doing there in terms of managing all that you had going on there. And so then how did you come to OHSU and your role as the senior associate dean for research? What was the path there?

26:37

Olvera Alvarez: That's a very interesting question. There's three reasons. The first one is, as I just told you, right? I graduated from Juarez. Went to El Paso. Did grad school there I did apply, by the way, when I was doing my master's, I applied to MIT. I applied to Stanford first. And then I applied to MIT for my PhD. I had a contact that somebody at Stanford already, they were waiting for me. They were super excited. I took my GRE again, so that I, as part of my application to Stanford. And I did outstanding on my analytical, my mathematical, and then horrible on my verbal/oral skills thing, right? And that's because I—I would probably still do horrible today, to be honest.

Bratman: (laughs) I don't know about that.

Olvera Alvarez: Yeah, so, yeah, so it was heartbreaking that I didn't get in. And I was so convinced that I was going to get in because I already had talked to who was going to be my mentor. And I was so sure that I was going to get in because I was so arrogant at the time that when it didn't happen, it broke my heart. So the point is, I stayed at UTEP. And I'm all frustrated. Not because I hate UTEP. I love UTEP. But because I haven't left. You know? I haven't left. So I'm, I graduated in Juarez and then I went to UTEP. And then I stayed there. And my career was going great. But again, this insecurity that I'd been dragging throughout my entire life, was like, but could you be good anywhere else? Or this idea, sorry, in the back of my head, number one.

Second, in 2019, when is when I moved to OHSU, the president of UTEP, Dr. Diana Natalicio, which is one of my biggest academic role models, she was going to retire. So she had announced for retirement. My boss, the person that recruited me into nursing, he had left the year before to University of Colorado to be the dean at the College of Nursing over there.

So I thought, if I'm ever going to leave, and at the time I had an eleven-year-old daughter. So if I'm every going to leave El Paso and UTEP to go and put my skills to the test outside of this very comfortable environment, this is probably the time. But again, I love UTEP. And I miss that culture and the students. But I needed to get out and see if my skills were, I

needed to know how much of my success was my skills and how much was the environment. So there was some of that.

The other being from the desert, in the middle of the Chihuahuan Desert in El Paso, the idea of going to the Pacific Northwest was like oh my God, this is just awesome, right? Over here we have parties every time it rains. So, that was cool.

Bratman: Yeah. I'm definitely going to ask you about the environmental differences. Yeah.

Olvera Alvarez: Yeah. And then, and then, and then OHSU, I'm very interested in early life, the impacts of early life on health. And OHSU as a university, it's one of the birthplaces in the United States of the DOHAD, format, the Developmental Origins of Health and Disease. So the opportunity to come to OHSU and do research here was, and be mentored by these people that are the pioneers on that field, given that that's where my research is going towards, was very exciting. Of course, OHSU is this research machine. I mean, there's all this infrastructure, all this opportunity for mentorship. This is me thinking as a scientist.

And then me thinking as a research administrator, the School of Nursing when I was coming here, I felt was going through this transition from older, more established scientists to a whole new group of early-career nurse scientists. When I came here, I met a lot of the faculty. And they were all just graduating from their PhD programs. And as a research administrator, I thought okay, this is exciting. Because I get to come and put most of my focus on early career, where to be honest is most of my thinking and my expertise is. I mean, if I come here and everybody is an expert and established and have these independent programs, I don't know how helpful I'm going to be to any of them. But people that are a year or two or three behind me and have done all these thinking around this process, I could be very useful to them. So the circumstances of the school I felt were ideal. And have proven ideal.

Bratman: Yeah. Did you feel like, all these lessons you've been learning from these different places—UTEP, Harvard, the fellowship—about your thinking, about how to be a mentor and how to guide research and how to guide early career scientists—did that play out in the way you expected when you came in terms of that kind of guidance and how it played out for people as you helped them?

32:25

Olvera Alvarez: You know, yes. So far, yes. I mean, obviously there are a lot of things that I could have done better. There are a lot of things I could have done or should be doing that I haven't. And I'm always overanalyzing in retrospect. Oh, I shouldn't have done that or said that or whatever. But overall, this is, I'm about to start my fifth year at OHSU this fall. And no, I feel, I feel satisfied. I mean, I have really put a focus on early career, which is what the school needs. I have brought in the way we think about science and scholarship within nursing. Which is necessary across the field. But we're doing that in a very healthy way at OHSU.

I feel that I have expanded our culture to where an early career nurse scientist can feel safe to come to me, an associate dean, and say you know, I have these worries and these vulnerabilities, and how to help that. So there's a human component that I have brought to my position that I think it's so crucial. Especially early career. Especially nursing science. And again, that's impacted by all these other experiences, right? Both by my work and also the

service that happens outside. So although there's always work to be done, I have picked culture for instance as a starting point. I'm after changing our culture to where everybody feels welcome, supported, valued and heard, independent of number of impact factor or age index or funding number. I mean, I really want to promote meaningful science and meaningful scholarship over productivity. You know, productivity's important. Don't get me wrong. Academia just, we cannot be wasting our time or our money. But productive doesn't always translate to impactful. We need to be both, right? We need to be productively impactful. And right now I feel that academia in general, we're just so obsessed with productivity that we are sacrificing impact on humanity.

Bratman: Yeah. I've always found our conversations on that to be so informative and inspirational in terms of how you think about research and impact. And let's talk a little more about your research and your work. So I know, part of your current work. And we've seen parts of the journey into this involve psychosocial stress, the environment, and a link between low socio-economic status and health disparities. So can you just tell us a little bit more about what those connections look like from your work?

35:32

Olvera Alvarez: Yeah. So I guess a good way to start on that answer is just how the hell did I even ended up here. You know? How did I end up asking those questions? And it goes back to that starting point at the Health Disparities Research Center back at UTEP. And at the time I was asking myself, okay, we know that vulnerable communities get exposed to worst air quality. And my first question was, is that the end of the story? Is that where health disparities come from? Just the fact that if you're poor or brown or Black or whatever, you get exposed to worse air quality? And that explains at least the health disparities associated with the environment. And although again I was just an engineer, my intuition, at that time it was not even educated knowledge. It was just my intuition said no, I'm pretty sure there has to be more to the story than just worse air quality.

So it didn't take me long to figure out, again, sort of just by intuition and observation, that the people, these vulnerable communities that are exposed to air quality, they also have very stressful lives. These are the communities that we worry about next month's paycheck and the rent and choosing between electricity or the groceries or the rent. Right? And I ask myself, again intuitively at the time, would people that are having those stressful lives constantly, and then on top of that exposed to poor air quality, would they, would their bodies respond differently to the air pollution? And again, my hunch was it has to, right? It just has to. I know that is not the best way to go into a scientific question. But I was like, I'm pretty sure there is. So I started looking for evidence in the literature that suggested this. And a few years before I started doing my review, Laura Kubzansky and Jane Clougherty, in 2008 they had published the idea of that. Of stress, air pollution and health. So I found their paper. And I kid you not. I found the paper early in 2014. And in the summer, I was applying to the JPB fellowship. So, and you know, and for the readers, the JPB fellowship, which is housed in the Harvard School of Public Health, one of the directors is Laura Kubzansky. and Jack and Laura, Jack Spengler, who was the director of the fellowship, they mentored Jane Clougherty.

So I found the paper like in February. And in August I'm meeting Laura, who's the coauthor of the paper. And she's interested in that field. And she's asking me hey, what kind of

research do you want to go do if you get into the fellowship? Well, guess what? I want to do stress and air pollution. So that's how fortunate. And that's just one example of how lucky I've been throughout my life. You know, that I stumbled into the right question at the right moment. So in other words, I wonder if Laura thought I was just, you know, pitching her what she wanted to hear, you know, so that I could get into the fellowship. But no, genuinely, that was what was going in my head.

So I get into the fellowship. And now with proper mentorship, right? Because all these years, I graduated in 2006. This is 2014. It's been a while. And again, that is what happens when you don't have all the proper mentorship. And I had gone to psychologists and they had laughed at me. You know, sent me back home.

So now I go to the Harvard fellowship. And now I'm surrounded by, first of all by people that agree on the idea. And then people that know what they're talking about and that could guide me, right? And Jack, of course, and Mark but Laura specifically because that's her area of research. And then the fellowship pays for the possibility for me to engage with George Slavich at UCLA. Who's, you know, an expert on stress and stress measurement.

It's funny because people, and I understand people, right? They look at my background or they look at my CV and they see environmental engineering. And they ask themselves, what the hell is this individual talking about stress? But the reality is that I had and for now almost ten years, the good fortune to be mentored by brilliant people that really know what they're talking about when it comes to stress. And it's funny because now I find myself talking to behavioral scientists about stress. And I'm like, what are you talking about? You know? And it's fun and that's a whole other conversation. Because I don't have the authority on paper to have these discussions. People do not listen to what I'm saying sometimes. And this is so frustrating. But the point is, that's how I get trained. When I'm getting trained and I'm looking at the stress/air pollution connection, I stumbled into the early life stress literature. And that's just fascinating. And at the time, this is the first months after George and I became engaged to become mentor/mentee. He sends me one of his papers that it was under review. It was unpublished. I'm amazed at how much he trusted me. I'm so grateful.

So he sends me this paper. And he talks about hyperreactivity in the paper. He's interested in teenage females and stress and depression and all these things. And he mentions hyperreactivity over and over in the introduction. And a lightbulb just goes into my head. And I start thinking okay, if there's this psychological hyperreactivity that he mentions, maybe there's other hyperreactivities that go with it. I go into the literature and there it was. There was all this evidence of HPA axis and immunological hyperreactivity that seemed to be programmed by early life stress.

So I'm not a toxicologist, but for my good fortune, I had been working with an environmental toxicologist who's a very good friend, who had also greed to be a mentorship in my JPB fellowship. So now I go to him, right? Now I know that early life stress affects the immune system.

Bratman: Okay.

42:45

Olvera Alvarez: So now I go to Mike Chacon at the University of New Mexico, who's again, also a brilliant environmental toxicologist. And I said hey, let's talk about the mechanism of air

pollution, which is sort of the work that we did together. And of course the immune system is right at the center of the pathological pathway of air pollution and the harm it causes. So that was the connection, right? The immune system was the connection. Both air pollution and stress, early life stress connect through the immune system and air pollution, in fact, it's immunological response, causes an immunological response.

So now I have enough evidence to support the hypothesis. Which had been a hunch for a couple of years now. And so we wrote our paper, just proposing the hypothesis.

Bratman: Can you sum up the hypothesis for the reader?

Olvera Alvarez: Yeah. I'm very proud of that. Yeah. So the hypothesis is that people that are exposed to severe stress in childhood, their immune system gets programmed to be hyperreactive in general. And because air pollution activates the immune system to cause a cascade of inflammation, people that are exposed to earlier stress and have a hyperreactive immune system, they would also be hyperreactive to air pollution. So the hypothesis is, people with early life stress when exposed to air pollution would be hyperreactive compared to those that were not exposed to early life stress.

So we published the hypothesis and we design a study as part of my fellowship training to test that. And we took, it took us one, two, three years to collect the data. I finish up the data collection exactly when I'm coming to OHSU. Then the pandemic happened. So my admin work took over. And the paper, it's about to be submitted right now. Probably in the next six weeks or so.

44:50

Bratman: Very exciting.

Olvera Alvarez: Very exciting, yeah.

Bratman: And so this, just to, I mean, I'm sure these connections are clear. But this brings you, this kind of is part of that initial hunch you had about that link between low socio-economic status and health disparities, right? Because that's the early life stress part that tends to occur in those conditions. Would that be accurate?

Olvera Alvarez: Yeah. Thank you for highlighting that, Greg. You're absolutely right. So that was the missing sort of piece there, that connects all of what I just said back to my original and overarching interest of asking do people from vulnerable communities, is it more than just exposure. So the idea is that yeah, they are susceptible. Meaning biologically they hyper-respond to air pollution. Now the connection of vulnerability to early life stress, which is the one that's missing, is exactly how you just sort of outline it. That people that are either racially, ethnically, socioeconomically, even based on gender, that belong to those groups, not only their lifestyle is exposed to, is full of more stressors, their childhood also is, right? And therefore, and those associations are well established. So that's the connection. So if you belong to any of those vulnerable groups, the likelihood that you were exposed to severe stressors early in life is higher. And the likelihood that that exposure to severe stressors cause a hyper-reactive immune system is also higher.

Now to be honest and clear, that doesn't mean that hyper-reactivity can only happen in vulnerability. It can also happen in more privileged social groups. Because they are also exposed, some of them, to severe stressors in childhood. I'm just saying the prevalence of exposure is higher if you belong to a socially vulnerable group.

Bratman: So, you're doing this kind of cutting edge research about these intersections here and how they interact and in some cases may kind of cause exponential damage to health or challenges to health. And now we come back to, I know the balancing act you're doing about the kind of empirical work and the impacts, and the importance of making sure you have a foot in both worlds, I guess, one might say. Or putting the science into practice, right? So how do you see this kind of information that you're gathering and kind of confirmation of your hypothesis as helping to inform change?

Olvera Alvarez: Well, to be honest, there's a couple of ways. And first within academia, and I do feel very guilty because I have taken so long to get this paper out and other papers that sort of go with it. And even thinking about what the next steps will be. You know I think I do have the responsibility to do a better job at disseminating, I have learned so much since I got into the fellowship that I have only shared with people verbally. And you know how inefficient that is, right? So now I know these things. But I know them. So as long as they're here, they're useless. So the first answer to your questions is I need to share that knowledge with people. I need to vet it first through the peer review process. And I need to put it out there, right, so people can think about it, too. I do that very inefficiently. I do that very selectively. Again, I have the excuse of the pandemic for the last couple of years. But I feel that moving forward, I do have a responsibility to put my ideas on some paper and share them with the scientific community. I think that's the first genuine way to have impact. I need to share these ideas. And gladly I'll have, I mean, I have the hypothesis paper. I have this data-based paper that doesn't completely crack the nut open but I think it provides enough evidence for other people to get interested, and then really create a lot of research where collectively we can show what is going on. So that's one way of contributing.

But I think there's a whole other set of interesting ideas that I have learned as I study for the reasons of my program that I think impact other fields. So just the idea of susceptibility in general. I mean, I have learned so much doing my own work that I think there's a lot of ideas there that can contribute to other people's work in other fields. And I can see the opportunity and the need to write those papers, too. I had and I have had a lot of opportunity to think about that. So that's one way.

The other thing that I feel very drawn to, it's outside of academia, around this same idea of susceptibility. So the air pollution, all that stuff, is very interesting. But what I have come to realize is the misfortune and the adversity that an early life environment puts on the entire lifespan of a person. First of all, we don't pick our early life experiences, right? And it almost feels like a social lottery where you're born into. We know there's a genetic one, right? There's a genetic lottery that some people win. And now there's a social one, right? There's these social circumstances that you're born into that seem to determine a lot about how the quality of life you're going to have. So, and this idea of susceptibility is at the middle of that. So now I'm again going all the way to my interest in humanity and all these other things, and surveys. I feel this calling to translate a lot of this understanding beyond first of all, beyond the environmental health perspective and into the social quality of life perspective. And thinking about all these

individuals that are primed to be susceptible. Which in lay terms mean to have worse quality of life for various reasons, many reasons. And how to deal with that and how to make the most out of that. And how to maybe even curb what things like it's a life sentence of not as good quality of life as the alternative would have been. I'm mulling over the idea of writing a book about it.

Bratman: Oh, man. Yeah. So interesting. And I know a lot of our conversations touch on those kinds of areas of investigation. And your work, you know, encompasses the total environment, too, right? So you have the social environment and the physical environment. You gave great examples of the ways that those can interact to create kind of adverse health outcomes. But I know you're also doing great work on kind of potentially beneficial elements of the physical environment that might have a role in perhaps buffering against some adverse health outcomes or helping to reduce stress and things like that. And I'm just curious about, Oregon's so different from Texas in so many aspects of the environment, total environment, right? So has that difference and your kind of travels across the country from Texas to Oregon, impacted your research on the environment? Has it helped shape your thinking on how to think about different communities, different places and the total environment piece of all of that?

53:19

Olvera Alvarez: Yeah. So this is our, I think this is going to be a very fun conversation. (Bratman laughs) So, I mean, I don't know how to introduce this idea to the reader, right? Because here's where you and I, our relationship, really sort of informs the conversation. So let me frame it as first if you were not here. Because I think it's easier in my head to do it like that. So in the fellowship, before you joined and for the reader just to know, you're also a fellow of the JPB fellowship. And I'm first cohort, you're second cohort. And during the first cohort, Jack brought the idea of nature over and over. You know, I was basically thinking about the air pollution. It sounded really cool. It sounded really intriguing. But I could barely handle all the new information that I needed to learn, far less deviate to think about the natural environment.

By the time my fellowship ended, again, my data collection was almost over. And your fellowship was about to start. And I had at the time at UTEP a well-oiled machine in terms of a lab. I had spent the last five years putting it together. So out of just curiosity, I asked my team, hey, you know, we have the capacity to do this experiment with nature. And I'll come back and explain more. And maybe you and I can have a conversation about that. But this is how I honestly got sort of, I dipped my toes in that pool. Just out of curiosity, right? Without really knowing a lot about theoretical, the framing of this work. It was just because I had the opportunity and the idea had been brought to my attention. So we conduct this experiment using virtual reality and nature. And my question was, because the very little that I understood at the time is that nature, at least one of the theories was, that it reduce stress. And I said, you know, of course most of the literature that refer to this capacity of nature reducing stress, it was either conducted in or referred to green vegetation. Or vegetation. Or vegetation. (laughter) And that's kind of all I knew.

And I said well, wait a minute. If these individuals are right, and I live in El Paso, which is in the middle of the Chihuahuan Desert, this is really bad news, right? Because it's not green. And it doesn't have a lot of vegetation compared to the places where the research has been conducted.

And then I go to the literature. There's very little on the desert environment. Most of it like from marketing perspectives and other things. And I thought, so this is a cool experiment and we could do it here.

So we stressed people out in the lab. We exposed them to the office. We exposed them to a desert environment from El Paso, from around El Paso area. And we exposed them to a park from El Paso. Which will probably still look like the desert if you're in the Pacific Northwest. And we were asking, you know, how the stress response varied given these three different post-stress environments. With the hypothesis—this is important—with the hypothesis that the desert was going to be the worst, was going to have the worst effect. Because again, based on this evolutionary theories, the desert should be, at least this is how I interpret them, right, it should be stressful.

Bratman: Because there's no water there. There's nothing [sentence cut off]—

57:25

Olvera Alvarez: There's no vegetation, right? Yeah, exactly. Because the theories talk about the biophilia and all these other things. And these nurturing elements of nature, right? At least some of the theory. Now I know better. I'm just talking what I understood at the time. Which is obviously I had a lot of misunderstandings in my head. But that's where my head was, you know? It was like wait a minute, if green and biophilia and all these things are good, then the desert has to be bad.

So I go into the study thinking like that. And as you know, what we discovered is that the desert did a very good job at helping people unstress after we stressed them out. Right? And that opened a whole can of worms for me. Again, keep in mind I'm not an expert on that. But it brought up the idea, wait a minute. Yeah, there's this evolutionary perspective. But that might not be, well, now it seems obvious, right? That's just one level of thinking. The other one is going to be the lived experience. And all of our participants are from El Paso. And most of them grew up here. So there is this familiarity with the desert that we think might have played a role. We couldn't test for it, that question. But we think we could have played a role. And to be honest, I think it makes good sense and it would be worth confirming that that's what's going on.

The other thing is, also as we were writing the paper, that it became very obvious is that green and nature and nurturing are just a few of the elements from a landscape that even from an evolutionary perspective play a role in our perception of safety or threat. Right now I know, which I didn't realize at the time, that it makes perfect sense for the desert to also create a sense of safety, even from an evolutionary perspective. Because you could see a predator coming from miles away, which is something you cannot do in a forest or you cannot do in a jungle, right? The perspective that you have in desert is just so comforting.

And ironically I discovered that when I moved to Portland and I was driving in the middle of the forest, in the city, and never knowing where I was. And in El Paso, I'm always driving and you can always see the entire neighboring city. And there's just some comfort that comes with that.

So, in other words, there's some knowledge that was there but that was new to me that I acquired through the exercise. And I think that one of the contributions to the scientific community is the need to study deserts more. I think that's a genuine contribution from that work. Because there's very little research there. And the other is this very likely interplay

between our innate sort of tendencies and how they might—or very likely—are modified by our lived experiences. That as we do this research, if we only train everything from one bucket, like Robert Sapolsky says, right, if we just think evolutionary, we're not going to answer that whole question, right? We need to take the entire human experience and think about, yeah, what is the evolutionary history of humans, but also what is the lived experience of this individual, early life, last week, last minute, a second ago. And it's when we put all of those things together that we're going to be able to understand these behavioral responses to things like nature. So I got to learn that, and I think that's a nice contribution to the field that came from that work.

Bratman: And so just thinking more about because your study participants were from the desert, that they may therefore perceive the desert as even safer, right? Than a green environment, despite the psycho-evolutionary theory that would potentially argue the opposite. And so with the time in the Pacific Northwest, are there other study ideas you want to do that might put that kind of take a next step on testing that here on Oregon, or anything like that? Or do you have ideas about how you would further explore that, or the potential impact that might have in kind of real world settings, or benefits to people? Or thinking about bringing that kind of insight that you're gaining there into the other work you've had about these kind of toxic interactions, or interactions that can cause adverse health outcomes and how it might inform tailoring interventions that could help address those outcomes? Have you been thinking on those lines?

1:02:35

Olvera Alvarez: Yeah, that's a good question. So, there's a couple of things that, a couple of lines of research moving forward that open up from the work that we have been discussing. The first one, just to check that box, is this issue that came from that VR (virtual reality) study with the fact that we had participants from El Paso exposed to environments from El Paso. And that applies to my work, but it applies to everybody else's work. How much does the familiarity with that given environment plays a role? Because a lot of this work is framed from an evolutionary perspective. And we interpret the results from this evolutionary perspective, right? Citing the biophilia sort of theories and all these other things. we do far less of a job at interpreting the results from a familiarity respect.

Actually, if I remember most of the papers that I've read, it's never addressed, right? So there were highlights. Again, a big gap and therefore an opportunity. Regarding Portland specifically, it would be nice to repeat this study, but with people from the Pacific Northwest.

But the real question here is, how much does familiarity with a given environment play a role? The other thing that happened at Portland just to emphasize this point even further, my daughter was born in El Paso and grew up in El Paso. We go to Portland. She goes hiking. She's freaking out. Because she thinks a bear or something's going to come out of the bushes. Because she is not familiar with that environment. I mean, I think about a kid growing up in the Bronx. And I wonder if they would be stressed in the desert and in the Pacific Northwest. Because where they learned to assess safety is in the Bronx. Meaning a certain individual for they, maybe the people that we're afraid that are standing in the corner are the ones that made him or here feel safe. Right?

So again, this question about how we assess safety in general, or threat, and how much the lived experience plays a role, it's fascinating. Because remember, all the cues for safety and threat, no matter if it's a natural, built or social environment, mostly come if this combination of

innate with the social experience. And it doesn't matter the environment. So I think that question itself. I mean, how much of our response to environmental cues, or let's call it landscape cues, meaning have come from an innate place? And how much do they come from a social place? Intuitively we know, because it seems kind of obvious, it's both. But how those things intertwine for every individual, no idea. Which ones are bigger? No idea. When are they become more health relevant? No idea. So I think there's the whole line of work there that it's just fascinating. That includes, of course, the natural and built environments, but also the social.

Bratman: Mm hmm.

1:05:45

Olvera Alvarez: And then here it highlights another problem, right? How much when we assess this physical environment, right, even nature or built, or even with the nature, brown versus green versus blue, a lot of these studies, rightly so because of methodological reasons, are absent of other people.

Bratman: Yes. Yes.

Olvera Alvarez: Right? So we control for the social environment.

Bratman: Right.

Olvera Alvarez: Right? But in reality, when we go hiking and we go to the beach, a lot of us go with other people. And how much that plays a role.

Bratman: Right.

Olvera Alvarez: And then on top of that, sometimes we do go alone but then run into other people at those places. And here's where now these social constructs start to play a role, right? What if I'm brown and you're white and we run into each other on a hiking trail in the Appalachians or something? So there's all these, I think that the future of the field is fascinating. Because we are here trying to look for suggestions for interventions how to interact with your environment, physical, built or natural. But I think we're far from really knowing what combinations of all these things are going to really end up, or what are going to be the prerequisites for a given landscape or environment to genuinely be healthful or healthy to you. Right now I think we're overprescribing certain things. assuming that everybody goes there and everybody has the same experience.

Bratman: Mm hmm. Mm hmm. Yup. The social environment exists within the physical one, right?

Olvera Alvarez: Exactly.

Bratman: These are not completely separate. And now you're going to impact the effects of both. And I think, you know, one of the many really interesting things you're bringing to the

nature and health field, so to speak, is this notion of perceived safety, scanning for safety, social safety theory, all of this stuff. And embedding that within the kind of hypothesized reasons why nature experience might and importantly reduce stress. So it's really interesting to see that this idea of safety plays such an important role in kind of stress reduction after an acute or chronic, probably, right, stress experience. Set of stressful experiences. So, lots more to come from you, I'm sure, on that. And completely fascinating theoretically. And I hope it's clear to the reader how important it is on the impact side of things and the sort of practical application of the science to take all these factors into account in the way that you're stating so nicely here and so clearly.

I mean, another kind of intersection that's really interesting that's kind of permeated our conversation thus far is that of mental health with physical health. And so some of these stressors and experiences seem to come on the mental health side of things, others on the physical health. And there are interactions there, right? So do you view those issues of the kind of impact of the environment on mental health as well as on physical health as separate? Or do you view them as interconnected?

1:09:14

Olvera Alvarez: That's a great question, but one that I have to start with a sort of caution, right? I am trained ultimately as an engineer. So, if you're the reader, take my answer with a grain of salt. So yeah, this is not health advice or anything. But no, I like the idea. And I really want to use the word "like." I'm picking it carefully. I think health science, let me start there, from my perspective, I think health science, it's converging towards that. Towards the idea that mental health and physical health, it's two ways of seeing symptoms, right? Physical symptoms and mental health symptoms. But that ultimately we were recognizing that we're one organism. It seems to me, I'm not a historian of health science or clinical science, for that matter. But it seems to me that not long ago, we taught that the psyche and you know, the body were, we still use the word, right, body and mind.

Bratman: Yeah.

Olvera Alvarez: Two separate things. for me at least, it seems to be very obvious, they're not two separate things. the mental part, the behavioral part, it's just the symptoms of what is happening biologically. And more importantly re the symptoms given in certain context, right? So in other words, behavior, to be more general, behavior is just the outcome of your biology and your environment at a given moment. And that if we understand the biology and that environment totally, we could predict your behavior. I think that science might get there one day. So therefore, right, if mental health is, it's observed based on your affective process, your emotional processes, your cognitive processes and specifically how those affect your behavior, then at the most fundamental level, they're not two different things.

Bratman: Mm hmm. Mm hmm.

Olvera Alvarez: Like they're two ways of understanding the same set of processes. But they're not two separate things.

Bratman: And we've talked about, and again, this is work that I'm not an expert on, but just intersections of something like inflammation with both types of health outcomes, right? I mean, it's associated with both mental and physical health and other ways in which maybe, you know, physical, environmental exposures that lead to inflammation could have mental health outcomes, right? I mean, there's work coming out of there, pollution on anxiety and things like that. Direct lines there, I think. Again, I'm not an expert. But I think the kinds of stressors you talk about, and the kinds of outcomes you talk about, seem to include these really interesting between both, if we separate them out in the first place, both kinds of outcomes, so to speak.

Olvera Alvarez: Yeah. Yeah. And again, just to be sort of genuine and honest with the reader, right, so the way, the evidence that I use to make this sort of conclusions, one is, again, reading other people's work. But more importantly is, a very clear model of what we're talking about, for me, that I'm familiar with, is the stress/inflammation/depression model, right?

12:58

Bratman: Mm hmm.

Olvera Alvarez: There's a lot of good literature out there, very good mental health scientists. And they put forward a very compelling idea of how these things are connected. And there's a lot of evidence supporting those ideas, right? Stress/inflammation/depression.

We also know that, for instance, air pollution induces inflammation. And we also know that depression is associated from an epidemiological perspective with air pollution. So you start to make these connections and you start to see that again, and I'm using this example not to say that it's the best example. There's far better ones. But I wanted to use one that the reader would trust me on, right? Because this is the literature that I contribute to and that I read. And even in that literature, which is again not the best one to use this argument for this discussion of body and mind being connected. Even in this one, it's starting to become a very compelling story that inflammation does play a role. That there's this physiological processes that affect both. And that they can be affected by things like stress and air pollution.

Bratman: And bringing it back to early childhood experiences and how those can impact lifelong health outcomes, I have a two-part question. One, do you see a lot of this work that you're talking about right now and this progress you're making in your research and thinking about how to have it impact and how to put that science into practice, so to speak, do you see that as something to introduce to help buffer against those adverse lifelong health outcomes? How do you see it providing kind of a potential intervention to where adverse childhood experiences can lead in terms of health?

Olvera Alvarez: You know, the first answer to that, and I have made this mistake very often in my life, is that I say oh, there's nothing there. Then somebody sends me a paper the next day via email. So at least I haven't run into it. Not the way that I would love to see this type of work being published. I mean, where people are addressing these hypervigilant or hyperreactive, or just let's call it susceptible. Any aspect of susceptibility that is induced by early life stress. And interventions to either curve or unprogram the biologically programmed susceptibility.

I have run into a couple papers, probably two in the last couple of years that are starting to frame things like that. With nothing very sexy yet there. So definitely I think the people that started to frame the problem that way, that's where they're going. So there's a group of very talented scientists that are thinking like that and they are moving like that. And what I think they're going to do, because they're so influential, is that, and we're starting to see a few here and there to frame it like that. I don't think it's there yet. I think it's barely starting. Research that it's framed exactly the way you said it, right? Where, okay, you have this early life programmed susceptibility that messes up your entire life. What can we do to intervene to either curve or even put that phenotype in remission. So, no. But I do think, also, that the pieces of that puzzle, they are being put in place. You know, you look in literature and mindfulness. Your work, right? Your work on nature and affective processes. These are the bigger pieces that need to fall into place first so that individuals that are interested—like me, for instance, I'm interested in the susceptibility pathway—then I can use work like yours and ideas like yours to make this other connection. So I think the work on this intervention possibilities that affect the type of processes and mechanisms that could be associated with susceptibility are starting to fall into place. So that other folks can then use those bodies of evidence and start to use that evidence to ask this intervention question.

Bratman: And one thing that will be so important, as you pointed out and that really stands out for me in the importance of thinking about details in the real world with all of this is the experience you described that your daughter had when she first started hiking in the Pacific Northwest. Having again, coming back to your research, like not had those experiences in El Paso when it comes to the nature, or I don't know if there were social parts of the experience, too. So, you know, just in general, thinking about your work, the focus on childhood experiences and lifelong health outcomes, these potential interventions and the importance of paying attention to these real world details, how has all of this kind of been influenced or even sort of changed since you've become a father?

1:18:43

Olvera Alvarez: Oh, that's a great question. You just send us way, way back. So my daughter, so you know, this is funny. And I'm going to deviate a little because I really want to give this answer the way that it should be answered. I have always done, the good things in my life, you know, the good effort, the accomplishments and my commitment towards attaining them, have never been for myself. I would say to people, if I was only doing the things I do for myself, I don't know where I would be. Like I wouldn't work that hard, to be honest. So just to give you an idea, so I'm the first one to go to college in my family. And my mother, she always wanted me and my sisters to graduate from college. And for whatever reason, my sisters didn't get the chance to do that. So the entire pressure came to me. And again, the story's way, way longer. But at one point I said you know, I'm going to make my mother proud. I'm going to graduate from college. I'm going to do this for her, because she deserves it. So I did that for her. Just an example.

Then, when I went to grad school, I reflected on my grandmother and my great-grandmother and the sacrifices they'd made to bring my mother here so that she could give me a an opportunity. So I thought you know, I'm going to do this for my grandma. Because my grandmother was also very proud when I graduated college. So I said, you know, I'm going to

get a PhD. There were other motivations, you know. I really wanted to get paid to learn, as I'd said before. But then my grandmother became like my, the person I'm doing this for. And you know, my dissertation is dedicated to my grandmother. My master's thesis, too.

And then, by the time I graduate from my PhD, a few years before, actually, actually way before, like I was in college when this happened. Well actually, remember I told you I wanted to be a priest. The main reason I did not become a priest was because I discovered I wanted to be a father. Like I knew I wanted to be the dad for my daughter. And I knew I wanted a daughter. So she started to influence a lot of my decisions. So one of them, not becoming a priest. I quit smoking. I did a lot of things for her.

And then so after I had fulfilled my commitment to my mom and grandmother, the rest of it is all to her. And this is way before, way before the science. Like way before the science. So right now, just to give you an example, that question you asked, you know, the nature and the susceptibility, how much of that is influenced by her? Not a lot, really, to be honest. The commitment to my work and making sure that it's ethical and it helps society, that part I do connect with her. Because sometimes I just, I'm frightened by the world she's going to live in. Or she's living in herself. So I do want to contribute so that herself and her kids, if she decides to have any, have a better world. So, yes. There's, at that level.

Now, as a scientific question, I work with the Oregon Latino Health Coalition in Portland. And I'm on their executive board. And this is a nonprofit, well, a community-based organization that helps Latinos in Oregon. And you know, promotes and advocates for that health. And I recently came to them and said, "You know, I'm very interested in mental health challenges that young Latina women face." There's some literature out there that there are very unique ways that young Latina women respond to stressors. And their depression rates vary. Some data shows them as lower than white and Black and indigenous counterparts. Some of them higher. There's all these mixed literature regarding race and things like that. And my daughter struggles, just like me. She struggles with her mental health. And I became—so this is a question that is completely informed by her. So I'm starting to work with the Oregon Latino Health Coalition. We're going to set up a story. We're going to do a community needs assessment to understand the needs of young Latina women in Oregon. And in this case, the entire question is informed by seeing my daughter struggle and wanting to understand how I could help her better.

1:23:33

Bratman: Wow. It's so amazing how your reflections on your own personal experiences, you're consistently bringing them back into your work and into your kind of mission professionally, and how intertwined all of this is. And just hearing more, and knowing already a lot about your kind of journey and those crucial undergraduate years that you describe, and, you know, what you did get and then what you sought to get in your education afterwards. I know that one of your kind of objectives as the senior associate dean for research has been to increase involvement and engagement with undergraduate students. So are there reasons from your own life and other things, just kind of where you are right now that you see that make you consider that important to the sort of research infrastructure at OHSU? And also the experiences for the undergraduate students?

Olvera Alvarez: Yeah. That's a great question, Greg. Thank you for asking. Yes. Yeah. I'm very romantic about academia. I mean, not just the PhD and the science career. The idea of going to a university, the idea of what universities are and the role they play in society, or at least the roles they're supposed to play in society, I'm very romantic about all of that. And not only in the undergrad experience, especially in our one institution, certain institutions. Not only the undergrads, but almost even the grad students, the PhD students, I worry that, again, because academia, we're so focused with productivity that we have completely forgotten and almost lost the philosophy aspect of being a scholar in an academic institution. And we keep sacrificing philosophy courses and literature courses and English and history courses, right, because hey, you're going to be a nurse, and you're going to be an engineer, and you don't need that. And what we are producing and contributing to society are very well-trained engineers and nurses and dentists that have no capacity to distinguish opinion and fact. And have no capacity to formulate strong ethical or morally grounded opinions about what's going on in society. You know? We can design apps that can do amazing things, but we don't know objective truth from BS. And that's very concerning. Because the world that I want for my daughter and her kids, yes I want them to have Google and Facebook and apps and AI. But for most, I want them to live in a loving, compassionate, healthy, welcoming society. And right now I think academia we're doing a good job at solving the technical problems, some of them, that society has. But we seem to be sacrificing in exchange our contributions to society. Like the moral, the critical thinking contributions to society.

I'm amazed, Greg, even among, you know, we have these scientific meetings, conferences. And I meet these brilliant people that have research independence and they write these outstanding scientific papers and seem still to struggle with certain ethical and social conversations. Like we get so detached from the world and focus on our topic of research that sometimes it's scary.

So, one of the reasons that I want to reengage undergrads with research or science, more specifically, it's not just so that one of them, and nursing science needs that, so that they discover the path towards nursing science. Because that's a benefit to the field and society. But more importantly, I think every undergrad should find a way to, again, more philosophical, scientific thinking. Because I cannot imagine in recent times a moment in time when it was so urgent for us to help society distinguish between the objective truth and a personal opinion.

1:28:37

Bratman: So that critical thinking kind of training that comes with research in one of those important—and are there other major challenges you see facing kind of students in healthcare professions or healthcare educators, too?

Olvera Alvarez: Well I really, I think it comes to that, right? And then the other challenge in health science, to be specific, is this idea that somebody else will do the rest, right? So you and I write proposals to NIH and we review proposals to NIH. And at the bottom, the last little two sentences at the bottom of a specific aims page is how this work is going to impact public health in the United States. And it's always some version—not the very good proposals those are awesome but the rest of them are—this is going to inform an intervention someday, somehow. Somebody's going to come and read it. And I'm not convinced, and I think NIH knows this and that's why they're heavily invested in translational science, is I don't think there's enough work

being done to translate all this basic knowledge that we produce, outstanding, I'm not criticizing basic scientists of what they do. I think we need it and it's awesome. And the fact that we need translating is because there's so much also basic science being produced. I think we just need to balance the investment within health science and put a lot more in translational work. And more importantly, promote and facilitate the conversation between basic scientists and translational health scientists. Right? Because the basic scientists are just putting it out there in PubMed for other people to find someday. They go to conferences and talk to other basic scientists. You know, that's not helpful. We need to accelerate the translational path. So we need new ways of doing and funding and publishing science. And I think that's one of the biggest challenges going forward. We don't have the time to see if somebody finds our paper.

Bratman: And then, and I'm no expert in translational health, but I'm sure this is part of the approach of it is bringing the science to that as well, right? So taking the basic science and assessing how it plays out in a translational context, right? And being sure to assess that and track that, analyze that, to see you know, how does this basic science play out?

1:31:33

Olvera Alvarez: Yeah. And there are some people, right? So I'm a translational scientist, right? I mean, I'm looking at all this immunological stuff and toxicological stuff and then connecting the dots and asking the questions. So I don't want anybody out there who's doing awesome translational science, I don't want to undermine the work. And that's not what I'm trying to do I'm not saying there's nobody doing this type of thing. I'm talking institutionally.

Bratman: Yeah.

Olvera Alvarez: We're still relying on the individual, right, to find the literature, to translate. And I think we need to create centers. So right now, for instance, NIH funds these translational science centers, which usually are infrastructure centers that provide support for people like me. You know, people doing translational science. And that's awesome. But we need another type of translational health center where people are broadening and putting ideas to work, you know, a mixer, and force ideas to come. That entire translation idea to be asked. And I'm speed balling here. The point is, I feel we need to try different ways of accelerating the process. Right now we provide infrastructure for people that are interested. And that's nice. Actually, that's outstanding. But I think there's a lot of room for improvement. I'm going to meetings, strategic meetings, on centers around OHSU that are doing basic science. And this is what I'm asking them. Hey, invite more behavioral scientists. Invite more translational scientists from the get go, right? So that we know what the basic scientist is doing, so that we can already be doing the translation or preparing for the translation of that science. So that we don't have to stumble upon it.

And also to inform them hey, if you prove it this way, or if you produce this data in this other way, it might actually be easier for me to translate it. You know? And I think that's a better way, or at least a different way that we could also explore to just try to accelerate the translation.

Bratman: That's great. Yeah. So does that play a role, or could you describe more about, you've touched on it a little bit. But you're a principal investigator on the Nurse Engagement and Wellness Study, otherwise known as NEWS as an acronym, which is a longitudinal cohort study

of predominantly Hispanic nursing students from Texas, right? Over five hundred? Could you just talk a little bit about your approach to that as a PI, a principal investigator? And what you're doing with all of that cohort work?

1:34:25

Olvera Alvarez: Yeah. I think after I answer this question, it's going to be very clear to everyone that I have attention deficit disorder. Because the interest in this study, the original interest in this study, is in nursing there's a lot of turnover within hospitals, for instance. Hospitals are very stressful. And they're particularly stressful to nurses. Nurses run the hospitals, you know. They are the ones there all the time. They're the ones at the bedside, they're the ones taking care of all of us 24/7, twelve-hour shifts. Just, you know, physicians, I love them, but they come and go, and they assign. But the nurses are the ones really there, you know, doing the hard work.

And imagine, I imagine myself just graduating from my bachelor's and being thrown into an environment like a hospital. And no matter how well-trained I am, there's only so little we can do to train people for something like that, right? So nurses really complete their training at the hospital. And there's very little we can do to simulate everything that's coming at them.

So it's no surprise that specifically early on, the first twelve to twenty-four months, maybe even thirty-six months, the turnover is high. Recent graduates change jobs. And that's expensive on the system. Very expensive on the system. So it affects everyone's bottom lines, including the outcomes of patients. Then there's attrition. There's a lot of early-career nurses that just leave the profession after the system and themselves investing all this time and resources. And the system just throws them back out.

So the motivation from that study is that I wanted to know if there were risk and protective factors among our nursing students that could inform us how to provide more resources to them so that they would be better prepared to deal with the work environment that was waiting for them after graduation. So of course that was informed with my early life stress sort of perspectives. And a lot of the things that I was learning from that literature, the dean of the School of Nursing and a couple of nursing faculty at UTEP, they also informed it. They brought the nursing expertise. Obviously, I don't have that. So we collaborated and we put the proposal together.

And then people from the Harvard School of Public Health, they were interested in other stress-related and environmental exposure questions that nurses are always an interesting population to study with. So it ended up being this bigger thing that was now better funded and that produced data to ask a lot of questions. A lot of interesting questions, mostly around the idea of stress and biological susceptibility and protection towards stress. That was the common sort of denominator across all these different interests. So that's what the study is about.

So there's one of my colleagues, she published a paper on how early life stress increases the risk of being burnt out, even at the School of Nursing. Sadly I didn't get to finish the study. It was going to be a three-wave data collection. It was baseline, right before graduation and a year after graduation. I moved to OHSU before the third wave of data was collected. So we never got a chance to collect the data for the third wave.

So right now we're using the data to ask a lot of questions, including some air pollution and some nature questions, right? So we have used the data from the nursing students to do that. Now I do have a student now at OHSU, he's a nurse. He was at the NICU, most of his clinical experience is at the NICU. And he's also very interested in the wellbeing of nurses. So we were

able to draw a lot from that conceptual framework from the NEWS to help him develop the framework for his research. And right now he's collecting data across Oregon from nurses and other health providers to try to understand if early life stress and other factors increase their risk of burnout and things like that.

So, we're starting to relaunch the work. I think it remains even now after Covid, even more relevant than what it was before. So there's that possibility. And we have also, now that we're on the other side of the pandemic, we are reconnecting with the NEWS, or analyzing more of the data. So right now we have data samples to ask microbiome-related questions. Right now we're sending those samples to University of British Columbia. We're re-asking those questions, or asking the original questions. So I think we're a little behind, but we're not done. We're not close to being done.

Bratman: It's such an interesting and important example of how you're intersecting all these different areas of research and interest that you have with this cohort work and demonstrating how, you know, the total environment in that context has impacts on this cohort. And those impacts in turn have impacts on, say, patients in a hospital, right? Or in a healthcare setting. And so how intertwined all of these things are. That clearly from our conversation just now and other conversations we've had, feeds all of your approaches to research and to life, I think, is your sharp insight about the ways in which this is just a network of interactions. And how important that is for the health of the individual and communities and how to work that into how you guide people and mentor people. And so I'm wondering as we're headed toward the end of our time if you can return to that role of just describing the role that mentorship has played in your career. Both in terms of your personal mentors and the mentorship you provide to others, and how you bring all of this insight that you've gathered, like to the table in your mentorship.

1:41:35

Olvera Alvarez: Yeah, no, mentorship. It's probably the key ingredient of my career being what it is. I think there's a lot of things that I could sacrifice that would definitely have an impact. But none of them would have a bigger impact than if I didn't have the mentorship that I had. For sure. Me, and I'm a self-learner. I can read and understand concepts. But I don't know about other people, but I can very easily overestimate, become overconfident, or even misunderstand stuff, right? So just from a scientific perspective, my mentors have always kept me in check.

The second is, I have had the opportunity to learn a lot of things way beyond my official formal training. Yes, I do have the capacity to learn fast and to learn on my own. But very likely I would have done it not as efficiently, and for sure not as effectively without mentors. Right? So like Laura, George and Matt, which are experts in fields completely foreign to me before I met them, there's no way that I could have made progress in a way that was meaningful and impactful without guide rails that they put for me. And all the times they challenged my outlandish conclusions. I mean, I overestimated what evolution explains about a human being. And so they'd remind me, they educated me in a way, and they'd guide me to the right way of thinking. So that's just from the pragmatic perspective.

And then even more importantly, I have been blessed, and that's genuinely the word, to be exposed to people that are not only smart and very selfless and very committed to their mentees, but they're just wonderful people, you know? So that they don't only serve as a good role model as scientist, they serve as a great role model of citizens. And they remind me that no

matter how good or bad or accomplished I think I am, I'm still a person. And we live in a world and we're co-responsible for each other. And I see in them that commitment to people in general that really align with my own principles.

So I've been very fortunate to connect with people that I have learned in so many dimensions from them, that have served so many role models. And then of course moving forward, I want to be that type of role model to my mentees. Really challenge them to think about the impact of their work beyond the productivity and the academic expectations. Actually, I challenge them to have those things be byproducts of their work, not the driving factors of their work. Which sometimes is risky. It's risky as an advice. But I tell my PhD students, you should not focus on graduation. That should be a byproduct of the work you're doing. It should not be the goal. It should be the byproduct. And it's risky. It's risky to say things like that. But I genuinely think about them.

Yeah, no, and ultimately again I think, remind them, right, that there's this role in society, this romantic role that we need to play, right? That yeah, maybe we are here to fulfill some of our own insecurities and prove to ourselves how smart we are. And that's fair fame, right? We are all allowed and encouraged to improve ourselves and the way we see ourselves and understand ourselves. But ultimately, especially us here in the United States that are health scientists, that we use our public money to fund our research. We have a moral obligation to really carefully think what is the value to society of their investment in our work. Right? It cannot just be about you.

Bratman: Yeah. And it's so complex. And you talked about the intellectual challenges of civil engineering, which I'm sure are also complex. But the complexities, the intellectual challenges and complexities of this work that you're engaged in. And the ways in which not only the research questions themselves are complex with these interacting factors within the total environment and over the course of a lifetime and how stress plays a role and what that does to behavior and mental and physical health and how those are interconnected. But then how all of this relates to one's, in a sense, maybe the word is duty in life to serve others and to serve the community. Those interconnections are complex and interesting and important. And I don't know what other word to use besides inspiring to see that you use that in your mentorship. And I know just from speaking with you the ways in which you appreciate and have observed—correct me if I'm wrong—the ways in which your own mentors have impacted your career. Would it be right to say you're kind of bringing that to the table in how you are approaching your own mentorship now for others?

1:47:25

Olvera Alvarez: Yeah, definitely. And I want to say, you mentioned something right now about the civil engineering thing. And I think I have told you before, but I don't emphasize this to people a lot. Because it's funny, you know, because I hang out with health scientists or mental health scientists. And again, I'm an engineer. And I did tell you early on that sometimes people do not take my comments seriously because hey, you're just an engineer. But I do want to highlight an enormous advantage in my career and my science that came from being trained as a civil engineer that people just don't realize. Every year that passes, I'm like oh my God, I'm so grateful that that's how my career started. So think about a civil engineer. Let's say a skyscraper. So a civil engineer usually is in charge or can be in charge of the construction of the entire thing.

An architect designs it. But a civil engineer gets it done. Okay. So, I tell people, do you think that I know how to lay a brick? Or connect wiring or tubing or anything associated with building a bridge? And the answer is no, I don't have a clue. What I can do, what engineers can do, is look at this complex blueprint, right? This complicated thing. And figure out how to get it done by coordinating the expertise of a whole bunch of other people. And all the other people, they're focused on the brick or the welding or the plumbing or the wiring. And they need to be. They need to be experts on all of that. But the lead engineer, he just needs to know how all the things are connected. And give those details to them, right? But this person oversees the entire thing. And I have rarely shared with people, this is the reason why I can go and ask all these other questions that wait a minute, how you are asking those questions? It's because I just understand enough about what everybody's expertise is to connect the dots, ask the questions and get the answers and rely on them for the substance and the feedback. But I still approach my work as an engineer. I still see a blueprint. I still break it down. I still ask myself what expertise do I need? How much of that do I really need to know to make sure that it was done right? And then how do I put it all together? And it's very useful, by the way. It's very useful.

Bratman: I love that. Okay. Well, we have only a couple of minutes. Are there any questions you wish I had asked?

1:50:29

Olvera Alvarez: You know, I just want to sort of highlight, I appreciate OHSU doing this a lot. And I guess I really want to just recognize first the people at OHSU. Specifically my boss. And I promise you, this has nothing to do with, you know, just saying this because I want to say it. I'm very grateful for the support that I get at the university. And I'm specifically grateful for the support I get from my dean, Dr. Susan Bakewell-Sachs. I was just telling last week to faculty I was working with, I still haven't heard no from her. I've been there three years and I come with these weird, off the wall ideas. And she listens to me. She sometimes takes a little while. But she always comes back and says, okay, let's do it. And it's just so rewarding to work in an environment like that.

And then of course people across the university that I have met, they have been wonderful. I love working at OHSU. It's not perfect. Everything doesn't always go the way I would wish. But I definitely appreciate how people are so open to listening and collaborating, and how patient they are with me sometimes. Because I'm a very fiery person. So I appreciate that.

You know, I also want to say that I appreciate my friends. I only tend to work with my friends. Either I make them my friends or I don't work with them. So, that includes you, Greg. And I appreciate you doing this. I wouldn't have done it with hardly anybody else. So I appreciate the conversation. I appreciate you taking the time to have this conversation with me. And you know, I just want to think everybody since I can remember that has helped me a lot. I was trying to prove to myself all this time how smart I was. And ironically, Greg, the only thing I was able to prove is how lucky I am. That's the only thing I know.

Bratman: Can I just say you're absolutely smart, though?

Olvera Alvarez: Yeah, well, I appreciate that. But honestly, the answer to that question, I still don't know it. But am I lucky? Yeah, a lot. I've been surrounded by just outstanding people and mentors and stuff. I appreciate you all. Thank you.

Bratman: Well, I appreciate you, Hector. And I love our conversations. This was great fun for me. So thanks for inviting me to be a part of this. And I'm looking forward to another conversation with you soon. Whether it's transcribed or not. And I think we're right at time. So we should probably wrap it up. But I want to say thank you for all the, first of all, friendship. And you know, I heard this term from one of our JPB colleagues, Dr. Jennifer Roberts, about horizontal mentorship. And I've certainly received that from you. So you've been a mentor to me, too. And I really appreciate all the deep work you're doing. And it's inspiring to work with you, too. So, thank you. And I think we'll wrap it up for now. And I'm not sure how to end it. But I guess I'll just end the call. (laughs)

1:53:51
[End Interview.]