

Interview with Kirsten Smayda, Data Scientist at Pear Therapeutics
by Vael Gates, 02/07/2019



In early December, I interviewed Dr. Kirsten Smayda, data scientist at [Pear Therapeutics, Inc.](#) Dr. Smayda studied Cognitive Psychology and Voice Performance at Boston University for her undergraduate degrees, got a Master's degree in Music and Human Learning from the University of Texas at Austin, and earned a PhD in Psychology (Cognitive Neuroscience) from the University of Texas at Austin. She was an Insight Data Science Fellow before she began working at Pear Therapeutics, She was an Insight Data Science Fellow before she began working at Pear Therapeutics, a company in prescription [digital therapeutics](#). She generously spoke with me about her work for this interview for [Beyond Academia](#), a student-run organization aimed at providing resources for PhDs pursuing careers outside academia.

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Vael: What is your job?

Dr. Smayda: I'm a data scientist for Pear Therapeutics, and the data science team has three main roles in the company. First is to provide analytics tracking for each of our product lines, or how people use our prescription digital therapeutics, or PDTs. Any time anyone makes a decision in the PDT or clicks any button, that creates an event sent to our database, and that's the primary data that I work with. A second role of data science is to develop our own data science initiatives, in which we ideate on novel ways to use data for internal Pear decisions and also within the context of a treatment program. For instance, from using data to gauge employee satisfaction, to thinking of important app-use predictors that could influence a clinical outcome. The third way that we work is as a service organization to the rest of the company. Anyone who has a question about the data can submit a ticket for their data question, I'll run an analysis for it, and I'll return the results and an explanation. We have a ticketing system, so I prioritize it along with my other responsibilities.

Vael: How big is your team, and how big is the company?

Dr. Smayda: The company is just under a hundred, but the data science team is only a team of two. Currently, the data science team is only a team of one, because my boss is on maternity leave starting her amazing family. That's been an exciting mini-transition in responsibility for me since I started in January [2018].

Vael: What was your path into data science? It looks like you did the Insight Data Science Fellow program and then went straight to Pear, where you're the only data scientist?

Dr. Smayda: As alluded to before, I came to data science by way of music. In college I was a voice performance music major, and that's what I spent the majority of my time doing. I was also getting a degree in Cognitive Psychology (partly because my parents encouraged a non-music degree, partly because the brain was starting to become very fascinating to me). Boston University had a full curriculum's worth of summer classes, so I ended up completing most of my psychology degree over summer sessions, which was also a much more preferred way to experience Boston. Junior year came around and I started to think about what I was going to do next after graduation. I had previously done a music therapy internship with the Music & Neurologic Function Institute, where I collected survey results from mostly Russian and Mandarin-speaking seniors attending community day centers. My data were going to be used as baseline measurements of "quality of life" for a multi-site non-randomized music therapy intervention. That experience, combined with my basic Psychology Bachelor's degree, sparked a fascination with how the brain processes music, and how music learning and performance affects the brain.

So I started searching for Master's programs that had *any* kind of music research going on. If it were at a large university, there would be opportunities to learn the neuroscience-perspective I felt I was lacking and wanted. I found the Music and Human Learning program at UT [(University of Texas at Austin)] on the internet and reached out to its director, Dr. Bob Duke, to learn about what they were doing, ask about anything related to my interests, and to learn about what music research looks like at UT. He encouraged me to apply even though the program is catered for music-educators (the research-based music pedagogy program at UT was SO impressive to me, but I had no experience teaching and wasn't interested in it) and allowed me to take psychology and neuroscience classes to fulfill my "electives" credits instead of teaching. His flexibility and support was critical in my cross from music performance to music research. While in my Master's program, I got involved with research as an assistant in Dr. Duke's lab, a lab in the Psychology department that studied computational decision-making and had just started a collaboration with an auditory-neuroscience lab in the Communication Sciences Disorders department under Dr. Chandrasekaran.

Fast forward through my PhD, I was able to study some really cool auditory category phenomena in young adult musicians and also older adults. Eventually I received an NRSA grant from NIA to study how 10 weeks of group piano lessons affects older adult speech perception in noisy places. During my grad school career, I started to see gaps in the research of cognitive-perceptual training literature and the way industry-type ventures were developing products. Industry clearly didn't have a grasp of how to improve cognition in a sustainable and meaningful way. That, combined with a partly toxic graduate school work environment, helped me seek out opportunities in industry. There were two women from my lab who had completed the Insight Data Science Fellowship, so it seemed like a strong possibility. I was applying to jobs straight from academia for at least 11 months with zero success, and from Insight I learned all the reasons why. My now-boss was an Insight alumnus, so she came in to give a talk to our cohort, which included an interesting dataset that was centered around sleep patterns (what psychology

person doesn't love learning about sleep patterns?) I networked with her to learn about any opportunities for me with her connections, and it turns out her currently company, Pear, was looking to add a data scientist.

Vael: What are the data science transition programs like Insight? Are there a lot of them?

Dr. Smayda: There are a few; I think they're growing in number. You can think of them as boot camps, although the traditional boot camp does not always work as actively with you to place you in jobs. I think there are a lot of key aspects about the Insight program that I'm not sure are at other ones. Insight is also tuition-free, but you have to be able to live in the location where you want to get a job, so that can be seen as the price for the program. Insight is geared towards PhDs with quantitative backgrounds, so that's the first different playing field. They also have companies that are interested in recruiting come in to give presentations to the fellows, so that you can learn about what the data science role in *this* company is and how that varies from the data science role in *that* company. That's super valuable because you get a read on the culture, the people representing this company, and what you'd be doing. And that's important, because data science can mean a lot of different things, really. What I do in my job is very different from what my friend in data science at like LinkedIn does, in the day-to-day at least. One benefit of Insight is that they work with you and prepare you for interviews, and set up interviews with different companies in the area that you're doing your fellowship in.

Vael: Tell me about the range of data science jobs that exist?

Dr. Smayda: In general, data science is working with data, coming up with stories about the data and presenting them to different key stakeholders. I would say that's universal across all roles of data science. However, what you're doing day-to-day in the projects you're working on can vary drastically. For instance, a lot of companies already have an infrastructure set up in their company to take in events and pre-process them in some way so that the data science team can work on them. At Pear, we're starting from ground zero since PDTs are an entirely new treatment class, and so I'm having conversations with the engineering team, the clinical team, and the product team to figure out what behaviors we even want to capture in the first place. And that changes from version to version, because the design of the PDT could develop, meaning what patients can do can change. Setting up the infrastructure is a lot of my job, and that's something that I wasn't prepared for from the Insight Fellowship. But of course you need to get the data before you can analyze the data. A lot of companies already have the data. For those companies, data science can look exclusively like model development, testing, and implementation. It just depends on what your data are and what questions you have about the data.

Vael: Why Pear? Why did you think it was a good fit?

Dr. Smayda: Well, a large objective in moving from academia into industry was to learn how the rest of the world works beyond the ivory tower (I grew entrepreneurial interests during graduate school), and maybe down the road I could find a position where I could make a positive impact on brains, or work with music-domain data again. That was what

I was working towards. When I learned about Pear, I realized that this was something that I would be getting in maybe my second or third job out in the Bay Area. The mix of industry and academia in the right proportion for me right now. We collaborate with local academic institutions (like Stanford), mental health clinics across the country, and national institutions (FDA, NIH) to develop a new way to receive mental health support. We take in feedback from subject matter experts (i.e. patients and providers) to inform our products from idea-generation to app releases. All of our apps will complete randomized control trials, which we submit to the FDA for approval. Learning about this entire process has been so exciting to me. I think the startup environment also suits me. I am empowered to think bigger than maybe you would be in academia. I feel like the work that we're doing here is what we write about in cognitive training-related grants in academia: like "eventually, this work could be used to further treatment in this area," and here we're trying to figure out how to deliver that treatment to people.

Working alongside clinical, product, engineering, and regulatory teams also innately feels comfortable to me because of my experience with the multi-departmental and multi-disciplinary collaborations I contributed to during my PhD.

Vael: Are most companies interfacing with academia or is this highly unusual?

Dr. Smayda: I think in the healthcare space that it's more common. I wouldn't say there's such a big need in most of tech to do that. But for companies that have a research component, they might be interfacing with academia to validate or improve upon their research practices. Academic institutions are better prepared to run research studies than a lot of startups and tech companies because they have they have access to participant populations and they have the protocols in place to carry out the research. So it makes sense to partner with academic institutions if only for patient recruitment. Participant recruitment is always an important objective! I'd like to see it more often, because I think that that bridge is really important for bringing academic research best practices into an industry setting that can propagate it to a wider audience.

Vael: Why did you decide to do data science?

Dr. Smayda: Well, it was a foot in the door in the direction of where I thought I wanted to go at the time, which was industry. That was what I was hoping for, but there's no way to find those jobs directly from psychology departments because I would say it is still relatively poopooed upon to leave academia for an industry job. This data science fellowship was the best opportunity I had at the time. I respected the people I knew who had gone through it, and they were successful in getting jobs and thought it was valuable. It also allowed me to move across the country, because I knew I wanted to move out here. So, I saw this fellowship as a means to what I needed in my next step. Turns out that data science is just the cleaning, analysis and presenting part of PhDs. The specific job will have different analytical methods and data, but in my job I'm really just taking in data, cleaning them, analyzing them however is required by the question, and then presenting the results back to people. So it's like a very small part of what most PhDs are

already doing. Which was a shocker, because it made me think that there should be an easier route for PhDs to get jobs as data scientists than what currently exists.

Vael: And the route right now is that people go through boot camps?

Dr. Smayda: I would say that's probably the most effective way to do it. But I think just networking in domains you're interested in, especially in a place like Silicon Valley could be really fruitful.

Vael: Best and worst of your job?

Dr. Smayda: It's funny because compared to academia, it's just like night and day sometimes. One thing that was surprising to me was that from day one I was already considered an expert in the domain that I was representing for the company. That was startling to me because in academia no matter how successful you become, the nature of the research beast is that you will never be an expert. Especially as graduate students, you are very aware of all that you should know, and don't actually know yet. And that's the nature of the research-beast, you will never know everything. But here in my first job outside of academia, I feel so much more empowered in my own knowledge and "contributing worth." Because we are a startup, my colleagues and I have the opportunity to contribute to building a safe, non-toxic culture for hardworking individuals in a way that Psychology departments across the country are still struggling to do.

The worst part... well, we're a small company doing very big things, so you honestly don't know how things are going to go some weeks. Especially in this space, there's no rule book for what's the correct way to do what we're doing. I would say that's probably the hardest part: there's no guidebook for any of us to be following for how to bring prescription digital therapeutics through an FDA authorization model and into the hands of patients. There's no research that I can look up on how to do that.

Vael: Are your hours and pay different [in industry compared to academia]?

Dr. Smayda: Yes, they are both better. I would say I am encouraged to only work one full-time employee's worth of work, and to have a life outside of work. I am compensated at a higher rate than what I was getting paid with my NIH Grant in graduate school, which is a bitter point for me because the work that graduate students are doing to further science under the financial (and other) conditions in which they are expected to excel can have a damaging effect on bright scientists.

Vael: How much influence do you have in company direction?

Dr. Smayda: The data science organization has grown to have an influential role in Pear's direction. Excitingly, the whole company is starting to see the many ways data can help refine our internal process and the clinical benefit we provide. But, it came out of conversations with groups in the company that had never used data as part of their day-

to-day decision making. I am super proud of the data culture we have grown at Pear, and I firmly believe data help us thrive.

Vael: Do you recommend PhDs go this path? Any general recommendations about path?

Dr. Smayda: There are relatively few professor positions available to all the qualified people who would be a successful professor, so “data science” or more colloquially “what you are already doing but with different data sets” allows you to flex the same skills in a related occupation. I hope the migration of PhD’s from academia to industry will benefit not only the individual scientists but also the quality of health interventions we see accessible to the masses. A general recommendation I have about path is to cast a wide net, network and learn as much as you can, and consider opportunities that get you excited even if it seems really different from the very specific research domain you’ve been engulfed in. You won’t lose that knowledge, you’ll have opportunities to stay relevant in your field, and you’re allowing yourself to think about your own scientific ideas from a different perspective that accounts for how the rest of the world operates outside of academia.