“I Can See Team Members Grow and Can Help Them Reach the Next Step in Their Career”

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Abstract In our interview with Marjolein Spronk, she shares her journey from studying attention with EEG and MRI to working as a data science team lead in industry. Originally planning for a postdoc, Marjolein discovered her skills were a great match when she began her current position in research services. She continues leveraging her analytical and technical abilities from her PhD. Marjolein encourages building a portfolio and networking to learn about industry science roles. She has found developmental opportunities and flexibility. Marjolein advises proactively exploring potential career options.

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Chris: Can you introduce yourself and tell me a bit about your current position?

Marjolein: I am a cognitive neuroscientist and data scientist. My journey started with an interest in Psychology, and I'm still fascinated by the human mind. My analytical side probably led me to follow the academic route of bio- and neuropsychology rather than one of the other branches that psychology has to offer. Currently, I work as a data scientist and team lead for a life science data services company in San Diego. Here I get to apply my technical skills on neuroscience data but also on data from other fields, like oncology, immunology, etc. We help clients leverage their research data, for example, by applying F.A.I.R. data standards (making data Findable, Accessible, Interoperable, and Reusable) to prepare large datasets from various sources for downstream analysis. Projects can involve development of code to automate workflows, data visualization, and statistical analysis. The work requires an understanding of the biological data as well as data science skills. The people I work with are all passionate about contributing to projects that lead to new discoveries that can have an impact on patients' lives, which is a great environment to work in.

What was the focus of your PhD?

I received my PhD in Developmental Cognitive Neuroscience in 2012, at Maastricht University in the Netherlands, the Department of Cognitive Neuroscience. My research focused on the development of attention and working memory in young children and adolescents with and without ADHD. I used electroencephalography (EEG) to measure brain activity while they performed computer "games" in which their working memory, attention, or both were challenged. I compared their performance and brain activity to that in adults to draw conclusions about brain development, for example, that adolescents are less capable of ignoring distracting stimuli – as measured by EEG and behavior – compared to adults.

As you were finishing your PhD, what were you thinking about your career plans?

As I was finishing my PhD, I knew I loved doing research and wanted to continue in academia with a postdoc. I had worked on a functional MRI study as part of my MSc degree and particularly enjoyed the image collection, processing, and data analysis, which is why I started looking for opportunities in that area. I didn't necessarily see myself end up in a tenure-track position, I just loved doing brain research and data analysis, and at the same time didn't have a good idea of what else was possible outside of academia.

How have your career plans changed as you've continued on to your current position?

When I started my current position, I knew I was passionate about science but honestly not sure what to expect working as a scientist in an industry environment. I started to work as part of a team on different projects and was happy to find out my skills and background were actually very useful. I was especially focused on automation of data processing steps, preferably in neuroscience but also in other therapeutic areas. Because the company was growing quickly, opportunities for career development also arose relatively soon. After being a technical lead on several projects, with mostly responsibilities for day-to-day technical tasks, I subsequently found myself in a data science team leadership (manager) position, maybe earlier than expected. This however has been a valuable learning experience. I feel lucky that my company recognizes that managerial skills need to be developed and has invested in professional development in this area. What I love about the position is that I can see team members grow and can help them reach the next step in their career. I also get to be more involved in the growth and direction of our data science group, which is exciting. At the same time – and very important to me – I still do a lot of technical work every day.

Can you tell us a bit about what day-to-day life is like in your current position?

As I'm sure is the case with many positions, I don't think the typical day really exists. The majority of tasks however revolve around client projects. Often, there are technical data science tasks to work on, like data wrangling, visualization, or analysis of life science data. Since we work with many different clients and groups, this is a pretty wide concept. I have contributed not only to projects handling

neuroimaging data but also expanded to other types of data from different therapeutic areas, which is in part what makes this job interesting since there is always something new to learn. Besides focusing on the technical work, there are meetings with the client to clarify their goals, plan, and discuss what needs to be done, as well as internal stand-ups to align our project teams. Occasionally, I help write project proposals, and naturally every project comes with some documentation work as well. As a team lead, I also have the responsibility to make sure that my team members have everything they need to do their work, are assigned to projects that fit them well, and can develop their skill set further so they can advance their careers. I meet with them regularly and work in the background to support them and solve any issues that may arise. Our leadership recognizes the importance of a good company culture and the need to destress and reload every now and then, so even though we all work remotely since the pandemic, there are plenty of opportunities to meet for social events, both virtual or in the area, and have some fun.

What do you like most about your work?

I work at a data science services company where we help clients by providing solutions to their data problems. In most cases, our team and the client's team work together on a project towards a deliverable. These projects can involve all types of life science data and therapeutic areas. This means that I don't exclusively focus on neuroscience but can contribute to any type of life science project where a data solution is needed. As a result, I'm constantly learning new things and the work is never boring. Technically it's diverse as well: I've set up data processing pipelines and curation workstreams, performed data analyses, built data models, led a team that created an application, etc.

What I also really like is the opportunity to work with many different people. We assemble a team based on the skill set that is needed for a project so who is part of the team varies with each project, and obviously the client team is a different one each time. As a result, I've had a chance to meet many smart and creative people (with and without PhDs!), and they are all driven by the same desire to better understand diseases and find new therapeutic solutions for patients.

And what do you like least about your work?

The biggest difference with scientific research in academia for me is that I work mostly on small parts of bigger projects now, whereas during a PhD you focus on one topic and research that from all possible angles. This deep dive approach and seeing a project through from concept to publication is usually not an option in my current position. There are times, for example, that I'd really like to explore a dataset more, but if that is not in the scope of a project, there are no opportunities to do that.

How do you think having a PhD has helped you succeed in your current position?

Getting a PhD requires creativity and resourcefulness to come up with original research ideas and to solve any problems that we encounter when answering research questions. Every PhD can tell you their stories on how they had to overcome certain obstacles. Similarly, in my current position, there may not always be a straightforward solution to a data problem, and we have to tap into our creativity to find the best approach. Also, many of the analytical and technical skills I developed during my PhD have been directly applicable. EEG and neuroimaging data are complex data types that require strong analytical skills to extract insights and present these in a meaningful way to others. Data analysis, statistics, programming, and visualization are all part of my work. Finally, while not something you learn during your doctoral training, I believe most PhDs have in common that they are naturally curious. This intrinsic motivation to learn is also what makes me enthusiastic about exploring scientific areas that are new to me, learn about new scientific methods and techniques, and expand my data science skills.

If someone currently finishing their PhD was considering a position similar to yours, how might they decide if it would be a good fit?

If you really enjoyed "handling data" during your PhD, i.e., wrangling and cleaning messy data, programming, visualization, and interpreting results, more than the other parts of a PhD, that would be a pretty good indication. You will also need a learning mindset since the data science field is developing rapidly and there are always new things to learn. But before making any decision and excluding other career paths, I would advise talking to as many people as possible to get a better idea of the different positions and companies out there. Also, one data science position may be very different from the next and will likely also evolve in the next couple of years.

If someone was interested in pursuing a similar career path, what would you suggest they do to better prepare themselves?

For a data science career specifically, I would strongly suggest building a portfolio with machine learning or other data science projects. This can be on a topic related to your research interests, but it may also be helpful to show that you have interests beyond this and can apply your analytical and programming skills in other areas as well, i.e., something unrelated to your PhD. Since a lack of experience is an often mentioned hurdle to overcome for new PhDs, a portfolio illustrating your skill set

can give a future employer that extra bit of confidence that you would be able to do the job, despite not having worked in a similar position before. Online courses may help broaden your data science toolkit beyond what you already know from your research experience.

I would also suggest being proactive and start thinking about your next steps early on. Start looking into possibilities and explore what job types exist and which ones interest you most. See if there are any programs in your university that can help better prepare you and if there are opportunities for an industry internship or collaboration for example. This is a great way to learn more about the type of work you could do and also to build a network outside academia.

A lot of people like academia because they feel it gives them an opportunity to work on a topic that they deeply care about. Do you think this is also true in your current position?

Yes, I think you can care deeply about more than one topic. It's true that I'm fascinated by the brain, which is why I chose to do a PhD in Neuroscience. I have been very lucky to find a position where I can still work with neuroimaging data but, in addition, I now also contribute to many other life science projects. What all these projects have in common is that the goal is ultimately to find new treatments for patients. Just like in academia, we may only contribute to a small piece of a big puzzle, but every piece plays a crucial role in the overall picture, i.e., can help us get closer to understanding diseases and developing new therapies.

Another reason many like academia is that they feel it provides them with more freedom than they think they would get in other positions. How much freedom do you feel you have to work on what you think is interesting?

There is indeed a lot of freedom in academia. You can more or less choose any research topic, develop your own methodological approach, draw out your timeline for completion, etc. If you work in a service company, a large part of this is determined by the client. However, knowing when a project is expected to finish, what the general approach will be, and what the deliverables should look like can also give a sense of clarity/freedom and peace of mind. And there is always still room for interpretation, such as choosing the best methods, tools, visualizations, etc. you think the project would benefit from. So there is that creative freedom as well. A lot of it probably comes down to your preferred working style. Also, if a project isn't a good fit for someone, that would most likely reflect in their performance, so they would not get assigned to that project in the first place. Overall, a lack of freedom therefore has never been a big concern in my experience. Many employers also

provide flexibility by having a professional development program in place, which allows employees to choose and plan out their career path and actively work on their professional growth, something that isn't the norm in academia.

Have you thought about returning to academia?

I have very much enjoyed my academic journey and worked with many great scientists that became friends and had some excellent supervisors that have been a great inspiration. The period since my last postdoctoral position has been similarly exciting and has given many opportunities for growth. Overall, this scientific journey is still ongoing. While I don't work at a university, I am still a scientist in life science research, handle the same datasets as I did before, and have been able to transfer my programming and analytical skills to other areas and types of data pretty easily. While I don't know what the future brings, I love the continuous learning and tackling of complex problems that are part of scientific research and I don't expect that to change.

Based on your journey, what advice or suggestions do you want to pass on to someone who's currently finishing their PhD?

First of all, be proud of what you've already accomplished! If you can finish a PhD, you have proven to be more than capable for a great number of positions, whether in academia or industry (or somewhere in between). If you don't really know what types of jobs are out there, start exploring and networking. Personally, I learned a lot from informal chats with people who worked in academia and industry and shared their experiences. Once you figure out your next career goal, make a priority of learning new skills or brushing up on skills that you know are important for that position. Lastly, they say that asking for help is a strength, not a weakness. Reach out to people in your network that you think may be able to give advice, provide a new perspective, connect you to someone else, or otherwise help you.

Is there anything else you'd like to tell someone reading this interview?

The decision to stay in academia or to transition to industry is a very personal one. Don't feel pressured to make a certain choice and don't compare yourself to others. Everyone's career path is unique.

Thank you for sharing your advice with us, Marjolein!