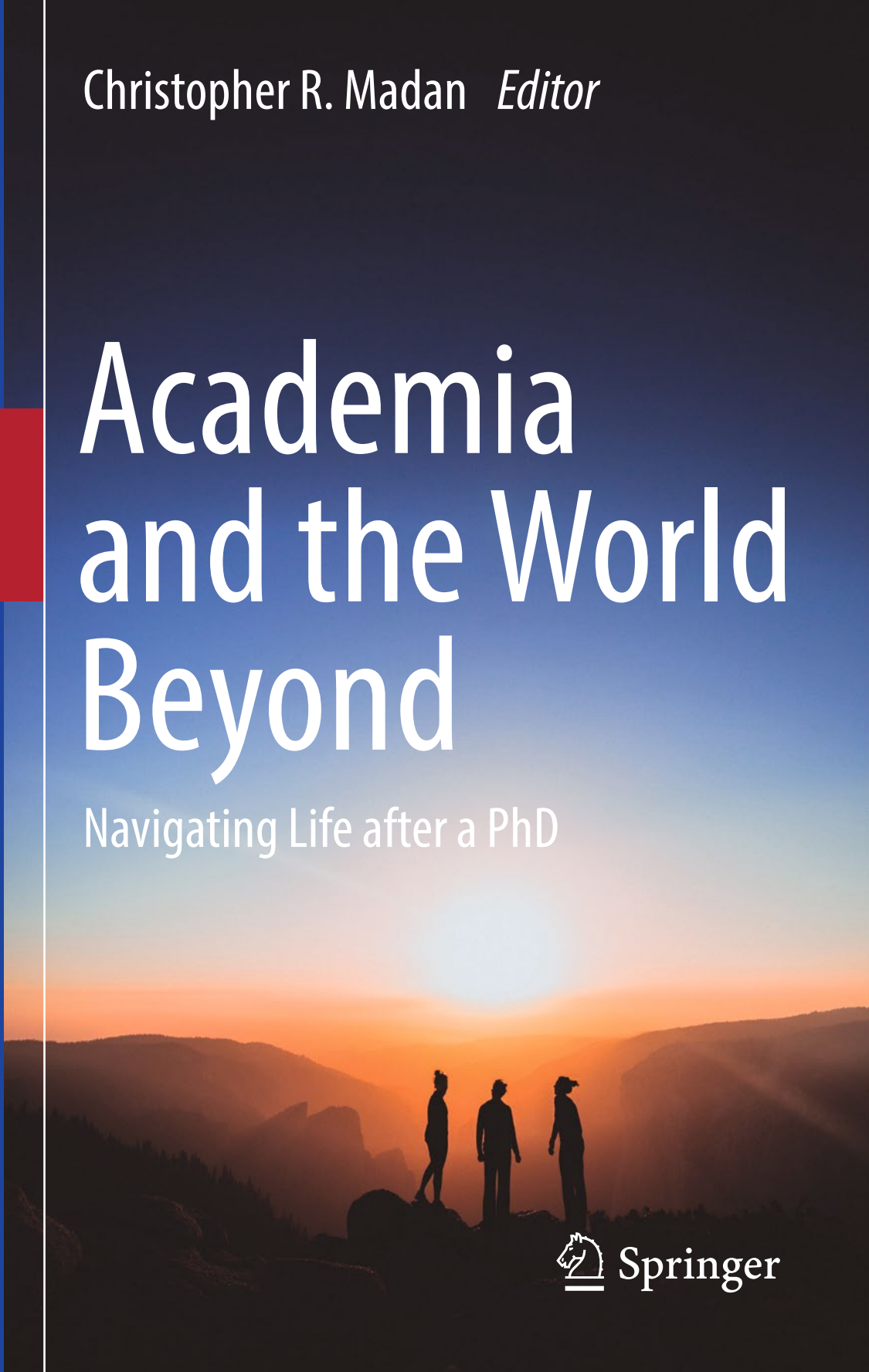
Christopher R. Madan *Editor*

Academia and the World Beyond

Navigating Life after a PhD



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Navigating Life after a PhD

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Editor
Christopher R. Madan
School of Psychology
University of Nottingham
Nottingham, UK

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For the PhD students unsure how to answer "What will you do after?" and the supervisors struggling to support those considering non-academic careers.

Acknowledgments

First and foremost, I need to wholeheartedly thank all of the contributors (again) for agreeing to be interviewed and sharing their experiences with us in this volume. Without their interest and support, there truly would not be a book for you to read now. It has also been a delight to get to know them better through their respective interviews, and I particularly appreciate their willingness to share personal challenges and realizations. Progress was slowed by the COVID-19 pandemic and related changes to teaching and caring responsibilities, but this book attests to the dedication of all contributors to share their hard-earned insights for the benefit of others.

Next, I would like to thank my friends and colleagues, as their encouragement was critical in motivating me to follow through with this project. The more I talked to people about this project, the more I was told that it was a much-needed resource.

Contents

Editor and Contributors

Editor

Christopher R. Madan School of Psychology, University of Nottingham, Nottingham, UK

Contributors

Kelly J. Arbeau Department of Psychology, Trinity Western University, Langley, BC, Canada

Gavin Buckingham Department of Sport and Health Sciences, University of Exeter, Exeter, UK

Alison Caldwell University of Chicago Medicine, Chicago, IL, USA

Neuro Transmissions, Chicago, IL, USA

K. Andrew DeSoto Association for Psychological Science, Washington, DC, USA

Jens Foell Department of Psychology, Florida State University, Tallahassee, FL, USA

maiLab, Heidelberg, Germany

Eiko I. Fried Department Clinical Psychology, Leiden University, Leiden, The Netherlands

Anastasia Greenberg Wilmer Cutler Pickering Hale and Dorr LLP, Boston, MA, USA

Jamie L. Hanson Department of Psychology, University of Pittsburgh, Pittsburgh, PA, USA

Learning Research & Development Center, University of Pittsburgh, Pittsburgh, PA, USA

Cleyde V. Helena ASC Group LLC, Centerton, AR, USA

Muireann Irish School of Psychology, The University of Sydney, Camperdown, New South Wales, Australia

Brain and Mind Centre, The University of Sydney, Camperdown, New South Wales, Australia

Jessica M. Karanian Department of Psychological and Brain Sciences, Fairfield University, Fairfield, CO, USA

Alice S. N. Kim Teaching and Learning Research in Action, Toronto, ON, Canada

Stavroula Kousta Nature Human Behaviour, Springer Nature, Nature Portfolio, London, UK

Elliot A. Ludvig Department of Psychology, University of Warwick, Coventry, UK

Joseph M. Moran Rapid7, Boston, MA, USA

Google, Cambridge, MA, USA

Aaron Moss CloudResearch, Queens, NY, USA

Maira Quintanilha Quali Q Inc., Edmonton, AB, Canada

Arfon M. Smith Space Telescope Science Institute, Baltimore, MD, USA

GitHub Inc., Edinburgh, UK

Lucina Q. Uddin Psychiatry and Biobehavioral Sciences, University of California Los Angeles, Los Angeles, CA, USA

Ana E. Van Gulick Figshare, London, UK

Simine Vazire Melbourne School of Psychological Science, University of Melbourne, Melbourne, Australia

Matthew B. Wall MRI Applications, Invicro London, London, UK

Faculty of Medicine, Imperial College London, London, UK

Clinical Psychopharmacology Unit, University College London, London, UK

A PhD Is a Journey, But Where Will It Lead?

Christopher R. Madan

Christopher R. Madan

Abstract A common question posed to PhD students from friends and family is: 'What will you do after?' But many students are too focused on the PhD itself and have not yet had a chance to sufficiently think about post-PhD life. Academic careers share many commonalities with many non-academic careers, with skills learned within academia being valuable in other career paths as well. To provide further context, here I provide background in my own training and motivations for developing this book. Several topics are discussed in multiple interviews and summarised here, in addition to an overview of the informational interview and suggestions on how the interviews can be used. I also provide insights on how academic life changes when transitioning to faculty and how the connectedness of modern Internet technologies can offset some downsides to this transition. This chapter ends with suggestions for additional resources to refer to and closing thoughts.

C. R. Madan (✉)
School of Psychology, University of Nottingham, Nottingham, UK
e-mail: christopher.madan@nottingham.ac.uk

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Contents

Introduction

While a PhD and the pursuit of advanced scientific training are useful in their own right, a PhD should not be viewed as a direct path to an academic position. Moreover, successful completion of a PhD is not the mastery of a singular skill; rather, it involves a mixture of field-specific training, scientific writing, data analysis and other skills. Importantly, these skills are relevant in a variety of contexts outside of academia—and a PhD should be considered as valuable training for a myriad of career paths. A PhD is a substantial accomplishment regardless of field and project nuances, and PhD students nearing the end of their degree often have been overwhelmed with the impending conclusion of this monumental task and associated procedures. As such, the question of 'what next?' has not been thoroughly assessed, and options beyond the academic career track have not been sufficiently explored.

An academic career is often associated with extensive flexibility and freedom. However, most who complete a PhD will not be able to find a permanent position within academia—regardless of desire and capability. The current system simply does not have capacity for all or most PhD students to become academic faculty. Even if an academic position is secured, if one is hoping to pursue a research-focused career, it is further important to acknowledge that grant funding is far from guaranteed and is sometimes required to maintain the position or for promotion. Though most postdoctoral research fellows are cognizant of their job prospects in academia (Woolston, 2020; Afonja et al., 2021; Council of Canadian Academies, 2021), everyone must find a suitable path for themselves.

For both PhD students and supervisors, the topic of non-academic careers can be difficult to begin to discuss. PhD students may feel lost, stressed by the impending completion of the dissertation and worried about disappointing their supervisor by considering a non-academic career. Supportive PhD supervisors may be unsure how to bring up the discussion and feel unqualified to provide the necessary advice about non-academic career paths that they themselves only superficially are aware of. In either case, my intention in making this book has been to facilitate these conversations and provide initial information about potential career paths in a format that is approachable to all involved.

This volume is a compilation of 22 interviews, all with people who have completed a PhD and are now in an academic or non-academic position. While it is unfortunate that there are not enough new academic positions created per year to be even close to the rate at which PhDs are awarded, ideally prospective PhD applicants should be aware of this early on. The perspective here is that this is not a problem to be solved and that PhD training is valuable for careers outside academia. As such, I consider 'non-academic' as more appropriate than 'alternative academic' or 'alt-ac', as these terms implicitly make the judgment that academia is the default path. Even this naming approach has limitations as there is such a diversity of positions outside of academia, but having a broad categorisation label is still useful.

In deciding who to interview, I focused more on those in non-academic positions because hearing more about these journeys is particularly beneficial for those completing a PhD as these are paths less discussed in traditional academic training. Even then, many of these careers are 'academia adjacent', as they involve regular interactions with academics—such as being a full-time journal editor, technical salesperson, or industry research scientist. Other non-academic positions may rely on skills learned in an academic setting but not necessarily involve a continued relationship with academia, such as some data scientist positions. For the academics I interviewed, I focused more on the job roles other than research because these are more distinct from the training that a PhD student has likely had (e.g. teaching, administrative/service responsibilities, broader considerations in running a lab, etc.).

About the Volume Editor and Interviewer

My name is Christopher Madan, and I am an assistant professor at the University of Nottingham in the United Kingdom. I study an array of topics, including memory, affect, decisions, aging and neuroimaging. Progressing from an undergraduate research assistant to a faculty position has taken me through academic systems in Canada, Germany, the United States and the United Kingdom. I care greatly about mentorship, trainee success and passing along what experiences I can. Apart from working with students in the research labs I have been in and now in my own growing lab, I am also on the Diversity, Outreach and Training committee of the Cognitive Neuroscience Society, and have been for several years–as well as having spoken on several conferences' career or trainee professional development panels. Additionally, I have written articles reflecting on research experiences and career choices (e.g. Madan & Chen, 2012; Madan & Teitge, 2013; Tsoi et al., 2018), guidance on doctoral supervision and studies (Madan, 2021, 2022), and guides for technical skills that I have learned along the way (e.g. Madan, 2014, 2015a, 2016). Even with my research interests, I have highlighted the parallels between research findings and their academic skill implications, such as using memory principles to improve scientific writing and teaching practices (Madan, 2015b; Van Hoof et al., 2021).

When I was a postdoctoral research fellow, I considered positions both within and outside of academia. Part of my process was to conduct informational

interviews with people I knew in different positions to get a better understanding of what those roles entailed. Considering the high rates of PhDs leading to non-academic careers, it is important that current PhD students consider the full array of potential career paths. Through the benefits of experience and being active in the science Twitter community, I now know even more people in a variety of careers. For this volume, I contacted many of them to seek out their advice, experiences and reflections—to help give those currently finishing a PhD a starting point to understand the variety of potential futures available to them.

Informational Interviews

This book is a collection of informational interviews with people that have completed their PhD and then continued in either an academic position or another career path. In either case, they have been successful and have a multitude of insights to share with those who are currently finishing their PhD. Though continuing in academia may seem like the only option for a recent PhD graduate, a myriad of other career paths exist. Even if you do not pursue any of these other paths, some consideration and exploration of other paths are critical—you do not know what you might be missing out on.

For each chapter in this volume, I conducted an asynchronous semi-structured interview with each contributor, where we wrote together in a shared online document. I first provided a common set of questions (listed below) and further asked follow-up questions based on the responses. This narrative format was intended to make it easy and enjoyable for the contributors to share their experiences, as well as for readers to find the information engaging. All interviews were completed between May 2020 and May 2021.

Most contributors have completed their PhD in Psychology or Neuroscience. As such, their advice and perspectives are particularly relevant to students in either field. These contributors have taken a variety of career paths. In the domain of non-academic positions, these range from data science and science communication to patent law and sales of scientific research equipment. In addition to those interviewed in this book, I have friends and acquaintances that have pursued other career paths but were not interviewed here. Some of these individuals are now in relatively academia-proximate jobs, such as working as hospital research coordinator or within a government funding agency to set funding priorities, but others have continued into quite distinct careers—requiring further degrees—such as journalism or doing a Master's in Business Administration (MBA). Given the expertise and skills associated with psychology and neuroscience research, I know many that have continued their careers into behavioural or data science across a variety of industries, including marketing, sports, real estate, retail sales, police, banking, healthcare research, book publishing, drug development, software development, automotives and technology companies (e.g. Apple, Instagram, Uber, Twitter).

The Interview Questions

Below is a list of standard questions I considered when conducting the interviews in this volume, with consideration to the type of position held by the interviewee.

1. Can you introduce yourself and tell me a bit about your current position?
2. What was the focus of your PhD? *(mention when, where, department).*
3. As you were finishing your PhD, what were you thinking about your career plans?
4. How have your career plans changed as you have continued on to your current position?
5. Can you tell us a bit about what day-to-day life is like in your current position?
6. What do you like most about your work?
7. And what do you like least about your work?
8. How do you think having a PhD has helped you succeed in your current position?
9. If someone currently finishing their PhD was considering a position similar to yours, how might they decide if it would be a good fit?
10. 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?
11. 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?
12. If someone was interested in pursuing a similar career path, what would you suggest they do to better prepare themselves?
13. Based on your journey, what advice or suggestions do you want to pass on to someone who is currently finishing their PhD?
14. Is there anything else you'd like to tell someone reading this interview?

What Should You Do with These Interviews?

Apart from just reading these interviews yourself, you could use them to facilitate group discussions. As one example, in my research group, I have the first lab meeting of each month designated as 'professional development'. Some topics include discussing what a faculty position job entails, various skills involved in academic research, the purpose of a dissertation and viva and considerations for finding suitable postdoctoral positions. For a few months, we had discussions where four to five students each read a different interview and described a summary of it, highlighting aspects they found interesting. This approach worked well in my lab, but individual reading and a reading group just among graduate students and postdocs are options

as well, e.g. if there are not many graduate students in the same lab or there are no typically weekly lab meetings already.

As a PhD student, you should consider doing your own information interviews with people that recently completed a PhD or new faculty in your department. If you do not know people from more senior cohorts of your PhD program, you could contact recent former students of your department or ask faculty in your department for their contact information. People you have met at research conferences or on social media (e.g. Twitter) may also be relevant to interview yourself.

If you supervise PhD students, I recommend you discuss the topic of non-academic careers with them, perhaps using these interviews, to demonstrate that you are comfortable discussing these options and that the student is not on their own if they choose to explore a non-academic career path. If the student is interested in these careers, do what you can to facilitate their journey. Obviously, degree requirements need to be fulfilled, but if a student is interested in data science positions, give them an opportunity to try more complex analyses or have an analysis-only role on another project that is additional to their PhD work. (For instance, attempt to re-create an analysis result using open data; see Madan, 2014.) If a student is interested in science communication, ask them to write a lay summary of a relevant paper. Consider suggesting they write a perspective/opinion paper that provides some novel synthesis but also is intended for non-topic experts. Related opportunities include Massive Science Consortium (https://massivesci.com/consortium/) and *Frontiers for Young Minds*. Discuss with the student and translatable training can occur, still within the realms that you have expertise in as a supervisor, but also forming the basis of a non-academic portfolio for the student.

Overview of Interviews

There are many unique perspectives provided by those interviewed, but before you begin, I thought it would be useful to briefly summarise peoples' current careers and highlight broad topics that are discussed in multiple interviews.

Some of the interviews are with individuals currently in research-focused academic positions, including Gavin Buckingham, Eiko Fried, Jamie Hanson, Lucina Uddin, Muireann Irish, Elliot Ludvig and Simine Vazire. Two interviews are with individuals in teaching-focused academic positions, Jessica Karanian and Kelly Arbeau. Alice Kim and Maira Quintanilha both used their academic skills as the basis of starting their own companies and continue to work with researchers. Several others interviewed are also in academic adjacent positions: Stavroula Kousta is a full-time journal editor, Aaron Moss helps researchers conduct online studies, Andrew DeSoto works in government policy for a major psychology society, and Cleyde Helena works in scientific equipment sales. Ana Van Gulick and Arfon Smith support scientific research through industry positions, working in management positions related to data organisation—though their paths there differed markedly: Ana held an intermediate academic position at a university library; Arfon

worked as a research software engineer for a time and then in a leadership position for a large technology-oriented scientific institute. Two interviewees, Jens Foell and Alison Caldwell, are in science communication positions. Joe Moran trained himself further in data science and user experience research and now does customer research. Anastasia Greenberg furthered her studies and is now an intellectual property lawyer, working with scientists as clients. Matthew Wall has found a position at the interface of academia and industry. Also worth noting, Elliot Ludvig and Muireann Irish both have experience in industry positions and returned to academia. A few have moved between universities after having secured faculty positions (Gavin Buckingham and Simine Vazire).

With respect to topics discussed, a few interviewees shared their experiences on the two-body problem of both individuals in a long-term relationship finding employment, including Jamie Hanson, Aaron Moss and Elliot Ludvig. Considerations about having children were discussed with Muireann Irish, Elliot Ludvig and Maira Quintanilha.

For those in non-academic positions, there are many reasons why people have pursued these career paths, but this is not always self-initiated. Several individuals who were invited to contribute to this volume had complicated views about transitioning to another career, having still hoped that an academic position would have worked out, now left jaded by the process. These individuals were not yet in a place where they felt able to provide advice to others. The interview with Cleyde Helena covers some of these topics, but I further recommend the Recovering Academic podcast (http://recoveringacademic.net) that she hosts along with two others.

Many interviews discussed considering the transferable skills you have developed as part of your PhD and that you should consider what you are passionate about.

Opportunities Just a Few Clicks Away

Doing research at the edge of current knowledge can sometimes feel lonely and isolating. It can be easy to forget the broader context (see Might, 2010), but it is also the focus of your work and can be particularly jarring when starting an independent position. As a PhD student or postdoctoral researcher, you work with others that have overlapping interests in a research group. In many cases, you have journal club discussions about recently published papers.

As an example of how things change, when starting a first independent academic position, there won't be others in your department with interests as overlapping, and there might even be only a few that are in your same subfield, e.g. cognitive psychology. Outside of the position itself, you may have moved to a university from far away and do not yet know many people. When in a more junior position, there often is support from new labmates and officemates, but this is not the case here. Moreover, now that you are in a faculty position and supervising trainees, it is important to ensure you have boundaries that go along with the responsibilities of supervision

and mentorship. For instance, frequently going out drinking with a subset of the lab could readily lead to the impression of favouritism, if not worse. While these are often the circumstances associated with starting a faculty position, the world is changing, academia along with everything else. In particular, the availability of the Internet can do a lot to broaden who we can connect with.

Applying for jobs itself is a lot less stressful if you have friends who are also at the same career stage who are also applying. Even more so when you each find positions you can collaborate with each other and figure things out together. While I collaborate with a few people, for me, the key friend here is Daniela Palombo. We were both postdocs in Boston, though at different universities, and soon found that we have a lot of shared research interests but have been using different approaches. Both of us are faculty now, and even though we are eight time zones apart, we chat often and discuss research ideas as well as other topics that have come with the role, such as teaching and approaches to graduate student supervision. We also commiserate with each other about challenges, such as less favourable teaching evaluation comments and grant rejections. Quite a few collaborative projects have come from these frequent conversations, and working with her has definitely been important for me to feel like I have someone to talk to as I learn to navigate these new dimensions of academia. Although this example pertains to my experience in an academic position, having close friends—even time zones away—is important to maintain, especially if repetitively uprooting your life every few years for the next position. Of course, it is also important to engage in your department and make new friends where you are. Go for coffee with people who have newly started and attend departmental social events (try to arrive with someone you know!). Try to present your recent work at an internal seminar to give others more insight into what you do now that the time pressure and stress of the interview have long passed and you are a colleague.

Social media can be a great resource for keeping connected to those far away and making new connections based on other shared circumstances, such as being new faculty (Madan, 2017; Cheplygina et al., 2020; Foell, 2021). This can be particularly useful for students to share their triumphs and challenges and to reduce imposter syndrome.

Additional Resources

The goal of this book was to collect and then share personal experiences and lessons learned from many who have progressed beyond a PhD and been successful. This interview approach to providing PhD-related advice is unique to this book, but the discussion of career considerations—both academic and non-academic—is an important topic discussed in many resources. For broad advice about choosing an ideal career track, see Bielczyk (2020). For academic advice, including advice with job applications and grant writing, see Kelsky (2015), Barker (2010), Gabrys and Langdale (2012), or Feibelman (2011). For non-academic advice, I suggest readers

to see Caterine (2020), Linder et al. (2020) and Duckles et al. (2020). For data science careers specifically, see Robinson and Nolis (2020). Do consider if these or related resources are available through your university library.

Final Observations

Beginning a PhD does not mean you are expected to commit to academia for life. Both academic and non-academic careers are associated with a long list of relevant skills and, depending on the specifics, bear a lot of commonalities (Vitae, 2010; Edge & Munro, 2015; Wright & Vanderford, 2017; Weber et al., 2018; Duckles et al., 2020). Some of these include creative problem solving, writing, technical skills, leadership abilities and public speaking. Academic positions themselves have a diversity and variability in responsibilities, much more than just research. Moreover, there are many non-academic positions that strongly benefit from PhD training—a PhD involves many skills; consider what are your strengths and what you enjoy and use these to choose a suitable career path. If you do explore non-academic career paths further, be considerate of how to present your skills professionally within these contexts, to use their language and reframe your work experience and skills to do justice to your years of experience, but within a non-academic context.

I sincerely hope you find these interviews helpful in considering and exploring potential career paths. It was a joy to get to hear more about the lives of those interviewed and help share their experiences, insights and advice.

References

Afonja, S., Salmon, D. G., Quailey, S. I., & Lambert, W. M. (2021). Postdocs' advice on pursuing a research career in academia: A qualitative analysis of free-text survey responses. *PLoS One, 16*, e0250662. https://doi.org/10.1371/journal.pone.0250662

Barker, K. (2010). *At the helm: Leading your laboratory* (2nd ed.). Harbor Press.

Bielczyk, N. (2020). *What is out there for me? The landscape of post-PhD career tracks*. Welcome Solutions.

Caterine, C. L. (2020). *Leaving Academia: A practical guide*. Princeton University Press.

Cheplygina, V., Hermans, F., Albers, C., Bielczyk, N., & Smeets, I. (2020). Ten simple rules for getting started on Twitter as a scientist. *PLoS Computational Biology, 16*, e1007513. https://doi.org/10.1371/journal.pcbi.1007513

Council of Canadian Academies. (2021). *Degrees of success*. The Expert Panel on the Labour Market Transition of PhD Graduates, Council of Canadian Academies. https://cca-reports.ca/reports/the-labour-market-transition-of-phd-graduates/

Duckles, B. M., & Open Post Academics Contributors. (2020). *Leaving the academy: Resources from Open Post Academics.* http://book.openpostac.org

Edge, J., & Munro, D. (2015). *Inside and outside of the academy: Valuing and preparing PhDs for careers.* Conference Board of Canada. https://www.conferenceboard.ca/edu/research/valuing-preparing-phds-for-careers

Feibelman, P. J. (2011). *A PhD is not enough! A guide to survival science*. Basic Books.
Foell, J. (2021). Social media science communication is a nonstop academic conference for all. *Nature Humam Behaviour*. https://doi.org/10.1038/s41562-021-01138-0
Gabrys, B. J., & Langdale, J. A. (2012). *How to succeed as a scientist: From postdoc to professor*. Cambridge University Press.
Kelsky, K. (2015). *The professor is in: The essential guide to turning your Ph.D. into a job*. Three Rivers Press.
Linder, K. E., Kelly, K., & Tobin, T. J. (2020). *Going alt-ac: A guide to alternative academic careers*. Stylus Publishing.
Madan, C. R. (2014). An introduction to MATLAB for behavioral researchers. *Sage*. https://doi.org/10.4135/9781506335131
Madan, C. R. (2015a). Creating 3D visualizations of MRI data: A brief guide. *F1000Research, 4*, 466. https://doi.org/10.12688/f1000research.6838.1
Madan, C. R. (2015b). Every scientist is a memory researcher: Suggestions for making research more memorable. *F1000Research, 4*, 19. https://doi.org/10.12688/f1000research.6053.1
Madan, C. R. (2016). Improved understanding of brain morphology through 3D printing: A brief guide. *Research Ideas and Outcomes, 2*, e10398. https://doi.org/10.3897/rio.2.e10398
Madan, C. R. (2017). Beyond the ivory tower: Reciprocal relationships between scientific research, communication, and mentorship. Oral presentation given at the *Annual Convention of the Association for Psychological Science*. https://doi.org/10.7490/f1000research.1114114.1.
Madan, C. R. (2021). A brief primer on the PhD supervision relationship. *European Journal of Neuroscience, 54*(4), 5229–5234. https://doi.org/10.1111/ejn.15396
Madan, C. R. (2022). Approaching the PhD thesis and viva: Clarifying expectations and enhancing preparations. *Cognitive Psychology Bulletin, 7*, 46–48.
Madan, C. R., & Chen, Y. Y. (2012). Getting involved in research: A guide for inspired undergraduates. *Eureka, 3*, 2–4. https://doi.org/10.29173/eureka16983
Madan, C. R., & Teitge, B. D. (2013). The benefits of undergraduate research: The student's perspective. *The Mentor, 15*, 61274. https://doi.org/10.26209/MJ1561274
Might, M. (2010). *The illustrated guide to a Ph.D.* Retrieved from http://matt.might.net/articles/phd-school-in-pictures/
Robinson, E., & Nolis, J. (2020). *Building a career in data science*. Manning Publications.
Tsoi, M., Teitge, B. D., Madan, C. R., & Francescutti, L. H. (2018). Personal values influencing career path in academic medicine: Perspectives of selected Canadian trainees. *F1000Research, 5*, 1903. https://doi.org/10.12688/f1000research.9026.2
Van Hoof, T. J., Sumeracki, M. A., & Madan, C. R. (2021). Science of learning strategy series: Article 1, distributed practice. *Journal of Continuing Education in the Health Professions, 41*, 59–62. https://doi.org/10.1097/CEH.0000000000000315
Vitae. (2010). *Researcher development framework.* Careers Research and Advisory Centre. http://www.vitae.ac.uk/rdf
Weber, C. T. et al. (2018). *Identifying transferable skills and competencies to enhance early-career researchers employability and competitiveness*. European Council of Doctoral Candidates and Junior Researchers. https://doi.org/10.5281/zenodo.1299178.
Woolston, C. (2020). Uncertain prospects for postdoctoral researchers. *Nature, 588*(7836), 181–184. https://doi.org/10.1038/d41586-020-03381-3
Wright, C. B., & Vanderford, N. L. (2017). What faculty hiring committees want. *Nature Biotechnology, 35*, 885–887. https://doi.org/10.1038/nbt.3962

"A Career Path in Open Science Has Been a Great Fit"

Ana E. Van Gulick

Ana E. Van Gulick

Abstract In our interview with Ana Van Gulick, she tells us about her PhD work and struggles with working alone and the slow pace of research. She subsequently worked as an academic librarian and learned more about data management and open science. Ana now works in a project manager role for Figshare, a company that serves as a scientific data repository. This role allows Ana to help researchers share their data, keep up with changing scientific research practices, and work across many disciplines. A PhD prepares people for many career paths beyond the specific academic field of study, as many skills are transferable.

Contents

A. E. Van Gulick (✉)
Figshare, London, UK
e-mail: ana@figshare.com

C. R. Madan (ed.), *Academia and the World Beyond*,
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Chris: Can you introduce yourself and tell me a bit about your current position?

Ana: Hi! I'm Ana. I was trained as a cognitive neuroscientist and currently work on supporting open research data at a technology company called Figshare that hosts a generalist data repository and builds data repository infrastructure for organizations. In my role as the Figshare Government and Funder Lead, I manage projects for clients in our government and funder sector that are both public agencies and private non-profits. I support both repository administrators and researchers who are the repository end users in implementing data sharing best practices so research results are discoverable and reusable. I also manage reporting and contract deliverables for these projects and work with our marketing and sales teams to find opportunities for our infrastructure to support open science at research organizations.

In my undergraduate research and for my PhD, I studied the high level visual system with both behavioral and MRI methods. I investigated how we recognize and categorize objects that we have a lot of experience with, such as faces. After completing my PhD, I worked in an academic library for 6 years. At Carnegie Mellon University (CMU) in Pittsburgh (Pennsylvania, USA), I first joined the University Libraries as a postdoc as part of a fellowship program run through Council on Library and Information Resources (CLIR) that brings PhD researchers into academic libraries in an effort to expand how academic libraries are evolving to respond to the changing needs of researchers. After nearly 2 years of postdoc, I was hired as faculty at the libraries to serve as the Liaison Librarian to Psychology and Neuroscience. The Librarian track at CMU is one without tenure, but with benefits and academic review similar to a teaching or research track. In both my postdoc and faculty role at the libraries, I focused much of my effort on open data practices and open science research workflows. I founded and directed the CMU Libraries Open Science Program that included training workshops, digital tools, and expert consultants to support more transparent, reproducible, and reusable research across disciplines.

What was the focus of your PhD?

My PhD training and research were at Vanderbilt University (Nashville, Tennessee, USA) in the Department of Psychology. There I was focused on understanding how we recognize and categorize objects using cognitive neuroscience approaches. To study these high-level visual processes, that is what happens following processing in the eye and primary visual cortex, we used both behavioral and neuroimaging techniques such as functional MRI to study downstream processing of visual objects. One question my PhD lab was particularly interested in studying was the effect of experience on visual recognition and a phenomenon called "perceptual expertise." Both the amount of experience and the type of experience recognizing

objects seem to influence how objects are recognized and what brain areas are recruited for this. There are certain categories of objects in the world such as faces, with which we have a high level of experience. Face recognition also requires not just categorization at a broad level, but individuation to recognize a specific person, which is a challenging visual task given how similar faces are to one another. It's been found that face recognition has certain attributes such as more holistic processing and recruits specific brain areas relative to recognition of other object types.

Much of my PhD work was aimed at understanding why these differences are observed with objects like faces by working to understand the effects of different types of experience. In some studies, this was done with training studies in which participants spent 10–-20 hours learning to categorize different novel computer-generated objects at the individual and higher category levels to see what impact these types of experience had on visual recognition. In other studies, we used real-world experience as the variable such as working with car and bird experts, that is, people with a personal interest in birds or cars who have both significant knowledge and experience with these categories. By designing visual and semantic tests about a variety of object categories from planes to shoes to mushrooms, we tried to parse the contribution of different types of experience versus baseline visual and intellectual skills to understand how perceptual expertise develops across individual differences in people.

Overall, we wanted to understand how experience affects visual recognition across individuals and how these differences are observed in the neural bases of the high-level visual system in the brain.

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

Over the course of the 5 years of my PhD program, I became increasingly interested in pursuing a career outside of the typical faculty tenure track. One of the main reasons for this realization was learning what I enjoyed about doing research and what I didn't. By my third or fourth year of graduate school, I had found that I really enjoyed active and collaborative work, whether it was working on research projects with other students and postdocs in the lab, doing analyses together with a colleague, or having subjects visit the lab and collecting data. This type of work made me feel like I had accomplished something each day and kept me motivated to do research. What I found I struggled with more was working alone, such as long periods spent programming code, reading the literature, or writing proposals or papers alone.

After having a first-year research project that moved slowly and wasn't published until my fifth year of graduate school, I learned about the sometimes truly slow pace of scientific research. While I think I had some understanding that research takes time from my undergraduate experience, I found it challenging to have projects that took not just many months or a year but truly took many years. A

faster pace of accomplishment like that more common in non-academic jobs would probably suit me better. I also did very little teaching as a graduate student as I was fortunate to have other sources of funding for my research and training, but based on my limited experience, I did not think that I wanted to have a future position with a heavy teaching component.

Realizing that the "active" part of research was what I enjoyed most and that faculty members spend little time doing research and much more time teaching and writing grants and papers, it seemed that wouldn't be the right match for me. Of course, that's to say nothing of the competitiveness of the tenure track job market, which would also have been a challenge.

Seeing that I liked working on a team and having projects that moved faster, it seemed that a non-academic position in a research field or applying scientific processes and knowledge in an industry setting would be a good path forward for me. Toward the end of my PhD, I was thinking about applying my research skills to scientific consulting or to user experience in the commercial sector.

To be honest, working in open data and open science was not a career path I considered in graduate school, although this was also a newer movement in science at that time as open science has evolved rapidly in the past 7 years. I also never considered working in an academic library on these issues as my experience with the library as a student was strictly limited to downloading journal articles online. I can say now though that a career path in open science has been a great fit – it allows me to be part of the research ecosystem, to support researchers and scientific discovery, and it is an exciting and quickly evolving field.

Working in an academic library was a great pathway into the fields of research data management and open science. This is a new area of work for academic libraries, and I feel like I got to have a significant impact on the program at CMU and to contribute to the broader library and open science fields. Nonetheless, the professional path forward in libraries usually involves becoming an administrator, such as an associate dean or university librarian and part of the library leadership, and after several years as library faculty, I decided I preferred to focus on working exclusively on open data and research rather than having to broaden my interests into more general academic library administration.

At Figshare, which is a relatively young (10 years) technology company, I've been able to focus on open research and work in a fast-paced environment focused on data repository infrastructure and support with an energetic and dedicated team.