"Finding Your Passion and Staying Authentic"

Muireann Irish

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Abstract In our interview with Muireann Irish, we discuss how she progressed from finishing her PhD in Ireland to her current role as Professor of Cognitive Neuroscience in Australia. Along the way, Muireann worked as a data analyst and saw how her PhD-related skills could be translated outside of academia, though she eventually returned to academia as a postdoctoral research fellow. Muireann also provides some insights into factors that contributed to deciding when to have a baby and how that aligned with career progression, but also raised her awareness of the leaky pipeline of academia. Since then, she has gained more experience in applying for grant funding, initially to create a small team, but later to consolidate a larger research group. The job role changes as you progress to becoming a group leader and increasingly work in a more managerial role. Academia should be viewed as a collaborative endeavour, including practices such as sharing previous grant applications and giving feedback to colleagues, as well as helping those who are junior scientists. As a trainee, it is important to try and have frank and open discussions with your supervisor, so possible future career options can be discussed.

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

Muireann: I am Professor of Cognitive Neuroscience in the School of Psychology, and based at the Brain and Mind Centre, which is a multidisciplinary research centre at the University of Sydney. In 2017, I established my own independent research group, the *Memory and Imagination in Neurological Disorders* group (*MIND*) comprising postdoctoral researchers, PhD students, honours students and research assistants from various backgrounds. We are interested in exploring how sophisticated and dynamic feats of human cognition are supported by the brain and how these processes are disrupted in neurodegenerative disorders.

What was the focus of your PhD?

I completed my PhD in Cognitive Neuropsychology at Trinity College Dublin in Ireland. My thesis explored how different facets of our autobiographical memories (i.e. our personal memories from the past) gradually change with the passage of time and how key features, such as the visual imagery and emotional experience of our memories, deteriorate in Alzheimer's disease. My PhD centred heavily around the development of a novel protocol to assess the phenomenology and the subjective recollective experience of autobiographical memory in aging and dementia, as well as to determine potential mechanisms driving these changes.

While I had not ever considered conducting a PhD, I had always been interested in memory. What began as a natural curiosity grew into a personal quest when my

grandmother was diagnosed with Alzheimer's disease. Watching such an independent and spirited woman slowly forget our shared history was incredibly difficult, and I desperately wanted to understand what was happening. As I progressed in my psychology degree, I found myself gravitating towards the memory literature, immersing myself in the cognitive neuropsychology studies on rare amnesic cases. However, it was during the third year of my degree when the penny finally dropped. I vividly remember sitting in a Cognitive Neuropsychology lecture given by Professor Ian Robertson and realising that *this* was exactly what I wanted to study. I can remember the desk I was sitting at and the exact layout of the lecture theatre, almost as though I were back there today. It was a wonderful realisation that perhaps there was a way for me to integrate my long-held interest in memory with my newfound passion for the brain and to use this knowledge to better understand the cognitive landscape of dementia. In one of the many fortuitous strokes of luck, a paid internship was advertised to work on a study exploring the use of music to enhance autobiographical memory function in Alzheimer's disease. I was successful in applying for the position and turned this experience into my honours thesis, which then formed the backbone of my PhD.

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

To be honest, I was so caught up in trying to get my thesis submitted on time that I really didn't stop to think about my life post-academia. The deadline for my thesis was looming, and my funding only covered me for 3 years, so I scrambled to get everything finished and submitted on time. Following my submission, I was lucky enough to receive a small stipend to focus on writing up my various studies for publication, and it was during this time that I started to consider my next step.

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

My career has been anything but linear as I have had a number of deviations from the traditional academic path. Following the award of my psychology degree, I decided to take some time away from academia and spent a year working as an administrative assistant in an architectural firm in Dublin. Similarly, following the award of my PhD, I realised that I had been in formal education for most of my life and I wanted to take some time away to explore non-academic career options. I was fortunate enough to be employed as a data analyst at a large multinational marketing consultancy, and I spent almost a year working in this company. During this time, I also decided that I wanted to see some of the world and made plans to travel through Southeast Asia, China, Australia and New Zealand. Initially, my plan was to spend 1 year working in Australia before returning to Ireland to hopefully resume an

academic career. This, however, coincided with the global financial crisis in 2008, which had left Ireland in a severe recession, resulting in a mass exodus of young graduates to Canada, the USA and Australia. It quickly became clear that I would need to stay longer in Australia, and I began to apply for postdoctoral positions in all of the major cities. During this time, I worked in two part-time research assistant positions that were not directly related to my primary research interests; however, I felt grateful to have relatively stable employment and an opportunity to potentially expand my research experience.

My first postdoctoral position came about as the result of a serendipitous email. I was scouting the major cities in Australia to see where the memory hubs were located and discovered that Professor John Hodges, formerly of Cambridge University, had relocated to Sydney and had established a large research group focusing on younger-onset dementia. I cautiously emailed him my CV, not expecting to hear anything back from him, and was pleasantly surprised when he responded and told me that they had just advertised a postdoctoral position to explore memory dysfunction in dementia! This was the opportunity I had been waiting for and would never have transpired if I had not taken the chance to email John. Thankfully, I was successful in my application for that position, resulting in another move from Melbourne to Sydney.

Can you tell us more about your post-PhD data analyst position?

While this was a complete departure from academic life, the data analyst position drew on many of the skills that I had developed during my PhD. Firstly, I had been unaware of how valuable the diverse set of skills that psychology graduates possess are and how such skills can be translated to the non-academic setting. When I interviewed for this position, I quickly realised that many of the basic inferential statistics that are the foundation of psychological research were readily transferable to this new setting. The fact that I could demonstrate a solid understanding of these principles and techniques, as well as being able to explain them in simple terms, was very important to the hiring panel. Interestingly, the company seemed particularly keen to recruit graduates with excellent interpersonal and communication skills, both written and verbal. These are skills that the vast majority of psychology graduates possess and demonstrated to me, at least, how much we have to offer beyond the immediate academic setting.

As a data analyst, I was working in a small team that managed accounts for large multinational companies. We were assigned to work on a specific company account for a set period of time, during which we would analyse their growth across brands, the impact of various advertising campaigns and promotional initiatives on brand activity, as well as how the launch of new products potentially cannibalised the overall brand growth. What was particularly interesting to me was how trends

differed across different geographical markets and how we could use these insights to augment promotional activities. The position involved a lot of Excel and SPSS coding, along with regular team meetings and international teleconferences. There was a heavy emphasis on communication skills, and we underwent a number of training courses to improve our presentation style to various audiences.

Even though I had not envisaged working in a corporate setting, I really enjoyed the culture of the company. The management team assigned me to a mentor, we all played on a touch rugby team together in a tournament, and the company regularly organised lunches and dinners to celebrate group achievements. I did, however, struggle with the lack of autonomy in that the work proceeded along very prescribed lines with little opportunity to deviate from the set course. This approach is almost anathema to the innovation and discovery that is part of the scientific endeavour, and it took me some time to adjust to working in this manner. Moreover, as deadlines approached, late nights in the office were expected, and there was very little flexibility around this. I remember a particularly gruelling period where I had worked 14 hours per day straight for 2 weeks and was completely exhausted. The company provided meals for employees during such periods; however, this gesture soon lost its appeal. There is a distinct difference between choosing to work long hours on something you are passionate about and crunching numbers for a company report, and it was during this time that I started to feel my motivation for the position diminished.

Lessons that I learned from this time included the very valuable set of skills that psychology graduates can translate to the corporate/industry setting. We represent a rare combination of analytic and critical thinkers, with excellent written and verbal communication skills. As I progressed in the company, I became more involved with the recruitment process and assisted in screening applications and conducting interviews. It was very clear to me that non-academic recruiters are most interested in interpersonal and communication skills and that the fit of the person within the company culture is paramount. These insights have been valuable to me as I have built my own research team and have made me reflect quite considerably on how to build a diverse and collaborative team that has a strong and supportive culture.

How long was it between finishing your PhD and starting your first postdoctoral position?

From submitting my PhD to commencing my first postdoctoral position, there is a rather large gap of 2.5 years. This period of time includes my working in industry, then my relocating from Ireland to the Southern Hemisphere, as well as working in Melbourne in part-time research assistant positions for almost a year.

As you're a full professor now, what was your journey from your first postdoctoral position to where you are now?

My first postdoctoral position was working on a project funded by the Australian Research Council exploring prefrontal and temporal contributions to episodic memory, using neurodegenerative disorders as lesion models. This position required that I learn the basics of structural neuroimaging as well as familiarise myself with younger-onset dementia syndromes including frontotemporal dementia and semantic dementia. I had previously worked only with mild cognitive impairment and Alzheimer's disease patients, and so this was quite a steep learning curve but one that I readily embraced as I was so grateful to have made it back into academia. During the first 2 years of my postdoctoral role, I set about reading as widely as I could to understand how the episodic memory literature had evolved during my research hiatus, as well as developing experimental paradigms that I could use in the new patient populations I was working with. This was a really exciting time for me and a clear turning point in my career. I was given the freedom to pursue the research questions that interested me and to work with novel patient groups with rare disorders. There is nothing quite like the feeling of watching your hypothesis unfold right before your eyes, and I remember feeling incredibly lucky to have found such a supportive and thriving research environment.

As I entered the final year of my postdoctoral position, my supervisors encouraged me to apply for funding to enable me to hire my own research personnel and thereby establish some independence. I was extremely fortunate to be awarded a grant from Dementia Australia which enabled me to hire a part-time research assistant to support me with data collection and data management. This grant ended up being the crucial stepping stone to securing a large independent fellowship the following year. Having demonstrated that I could attract my own competitive funding and manage a small team, I was awarded an Australian Research Council Discovery Early Career Researcher Award (DECRA), which provided salary and research funds for 3 years.

As my DECRA was drawing to a close, I applied for and received a highly competitive Australian Research Council Future Fellowship, which gave me 4 years of continuous research-focused salary. This fellowship came at a pivotal point in my research career, where I had to make a critical decision regarding my future progression. The research team in which I had been based for the previous 6 years relocated to the University of Sydney, and I was given the opportunity to stay at my current institute or to relocate with the rest of the team. It was an incredibly difficult decision, but having just been awarded the Future Fellowship, I was strongly advised to negotiate for a permanent position at the new university and was promoted to associate professor in the process. In 2021, I finally made the leap to full Professor following a rigorous promotion application and interview process.

I feel like deciding when to have a baby and how that aligns with career progression is a topic that many struggle with. Can you tell us about some factors that should be considered?

This is one of the most challenging decisions that I have ever made. First, it is important to state that there is no perfect time to have a baby, and I think that can safely be said for any discipline or industry. There are so many factors that will influence this decision, and so I can only speak from my own personal experience in this regard. I knew that I wanted to be a parent but I had heard so many disheartening stories about the 'leaky pipeline' of academia and how women are inevitably pushed out of the system as it is incompatible with parenthood. Having worked so hard to get back into academia, I really didn't want my career to be derailed by something that should be a positive and exciting time in life. I entered into this decision acutely aware of the challenges that would lie ahead, while vowing that I would not become another casualty of the leaky pipeline.

A chief factor in arriving at this decision was my receiving an Australian Research Council DECRA fellowship, which provided me with 3 years of continuous research funding. Following conversations with senior women in science, I decided to incur the career disruption early in the fellowship and to hopefully regain my research momentum upon my return to work. This decision was made a lot easier by the fact that the university I was employed with at the time had a very generous maternity leave policy, enabling me to take 6 months of fully paid parental leave and to extend the end date of my fellowship without penalty. My research group was quite small at this time; I had one full-time research assistant, one honours student and a number of mentees under my supervision. In hindsight, this was both good and bad. The advantages were that I didn't have to balance the demands of maintaining a large lab group and ensuring my students were achieving their career goals during my maternity leave, but it also meant that my research productivity was impacted significantly. It was another 4 years before I was ready to have my second child, again timed strategically with another Australian Research Council – a Future Fellowship, which provides 4 years of salary for research. At my new university, I availed of an extremely generous package of 9 months of full-time paid leave; however, this time it was a lot harder to disengage from my research as my team had grown considerably and I felt a duty of care to ensure that my students and research staff were progressing well.

In reality, the term 'parental leave' is something of a misnomer as most academics cannot afford to take this time completely off and there are countless stories of new parents surviving on very little sleep as they struggle to write grants, submit publications and deal with the precarious nature of fixed-term contracts all whilst caring for a newborn. I don't endorse my way as the optimal way to decide on when to start one's family, but timing my pregnancies with the commencement of my research fellowships worked well for my particular circumstances and thankfully has enabled me to avoid becoming another statistic.

It sounds like you've managed to navigate the Australian funding landscape really well, particularly in having moved there after your PhD. Do you have any advice or insights related to relocating and navigating different funding systems?

This is a really important topic for junior researchers to think about prior to relocating to a new country. In hindsight, I was wildly naive about the Australian funding system and had moved there without doing any prior investigation regarding funding schemes or even the research culture and what is expected at different career levels. By the time I had commenced my first postdoctoral position, I was already playing 'catch-up' as the Australian academic system is heavily weighted towards publications. Indeed, many students submit their theses by publication, whereas in Ireland, the emphasis had typically been on producing the thesis with the assumption that papers resulting from the PhD scholarly work would be published during one's first postdoc position. I had five publications to my name when I commenced my postdoc and quickly realised that I needed to 'publish or perish' as the old adage goes; otherwise, I was not going to survive in this new system.

For the first 2 years of my postdoctoral position, I set about developing my own new research area – exploring the contribution of semantic memory to prospection and imagination by studying the rare clinical disorder of semantic dementia. In parallel with launching this new line of enquiry, I also analysed and wrote up publications based on existing data that had been collected by the team as well as publishing a theoretical piece in the esteemed *Nature Reviews Neurology*. My mentors strongly encouraged me to apply for small pockets of research funding, which, although time-consuming, eventually resulted in my being awarded a grant from Dementia Australia. I firmly believe that this grant, although small, was pivotal in my securing the prestigious DECRA fellowship from the Australian Research Council the following year. I worked closely with the Research Strategy Office at my university, attended all strategic sessions and workshops, researched the track record of previous awardees and managed to source copies of successful grants. This provided me with a clear roadmap of how to pitch my proposal and the areas I needed to strengthen to increase my chances. Even though I didn't have a large corpus of publications when I applied for the DECRA fellowship, I had a strong statement outlining my career interruptions, complemented by clear evidence of my upward trajectory and my growing independence in my research area. Now, when I review for these funding agencies, I am acutely aware of taking career disruptions and 'relative to opportunity' into consideration, as well as looking for evidence of the emerging independence of the applicant in their chosen specialty.

In essence, my experience has taught me that quality trumps quantity and that it is possible to make a strong case for research funding through a well-crafted narrative that demonstrates your growing research momentum. The most important lesson I learned, however, is that peer-to-peer support and strong mentoring are crucial. If a colleague of mine had not told me about the DECRA and encouraged me to apply, I doubt I would have ever considered this. Likewise, if other scientists had not

been so generous in reading my drafts or sharing their own applications, my career pathway would look vastly different. My take-home message is that we must remember to be collegial and supportive, to inform others of opportunities, to share our previous applications and to offer to comment or review grant drafts. These small actions have such a powerful influence in determining the success of the next generation and can make all the difference in someone sinking or swimming in academia.

Do you think that someone who has just finished a PhD might not be aware of some aspects of being a professor and running a research lab?

Absolutely! One of the biggest challenges in running a lab is the responsibility of securing grant money to ensure that lab members have continuing positions and ongoing access to funding. I spend an inordinate amount of time writing grant applications, with the knowledge that if I am not successful, it could have grave implications for fixed-term members of my group. I find this part of the position quite stressful as other people's salaries and livelihoods are depending on my capacity to secure funding.

Another aspect of running a lab that many recent graduates may not realise is that as you rise through the ranks, you will be expected to commit a considerable amount of time engaged in service to the discipline and to the university. This can result in membership of committees from school to faculty level and the inevitable requirement to attend many meetings. For some, being able to contribute at the higher levels of the university system is hugely rewarding; however, others find the time spent away from their research frustrating. It is difficult to strike the appropriate balance of being a good departmental citizen and giving back to your university whilst ensuring your research group continues to thrive. Ironically, it seems the more successful you are as a researcher, and the higher you climb within the university system, you invariably become more removed from the research activities in which you excel!

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

This is an excellent question. I think there is probably quite a disparity between what emerging PhD graduates imagine a research career to be like and the reality of running a research group. For me, the critical factors to consider are communication and resilience. Making the leap from postdoctoral researcher to independent group leader is quite daunting as it means stepping out from the safety of your

postdoctoral supervisor/advisor and forging your own path. As I mentioned, this means taking responsibility for funding your research team and ensuring you can maintain the longevity of the team over the years to come. With funding rates abysmally low in Australia at present, this is not an easy task, and I have found myself becoming increasingly adept at budgeting, planning, and cost cutting to ensure the group can continue its activities in leaner times.

I would also advise current PhD students to consider their own leadership and interpersonal skills before embarking on the path to group leader. Essentially, you will be assuming a managerial role, even though you may have never trained for a position of that type. Inevitably, there will be times where conflict arises and you or your team will question your decisions. In addition, it can be quite challenging to be the main point of contact for questions and troubleshooting – you may not always have the correct answer, and sometimes, you may not have any answers at all! Cultivating a strong collaborative culture can help immensely in this context, as well as being open and honest about your own strengths and weaknesses. I often find myself saying to students that I don't have the answer, but that we can find out together.

I would like to see a more open discussion of what a career in academia entails in terms of balancing administrative duties, grant writing, team leadership and research activities. It is really important that emerging graduates consider all of the 'non-glamorous' activities like grant writing and admin that are essential to keep a research team ticking along and to consider whether this is something they are willing to do as part of their research career. I truly believe that running a research team is one of the most rewarding and invigorating careers you can choose. Even through the more challenging times, the passion that I have for my research and the enjoyment that I derive from studying the brain easily make it all worthwhile.

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

Even though my career path was somewhat circuitous, I gained valuable experience working across different settings and within diverse environments, which ultimately led me to realise that academia was the right fit for me. Although I didn't appreciate it at the time, I further gained a unique perspective on how to establish a strong culture in my team, as well as how to be creative and innovative in our research approach. As a result, I think it is very important for anyone considering a career in research to spend time working or volunteering in different lab settings and to gain exposure to different methodologies, techniques and approaches. If possible, conducting a research visit or placement overseas is a fantastic way to appreciate the many diverse approaches to science as well as to experience differences in research and lab cultures and funding systems. If this is not possible, then I would suggest establishing links with other research groups in your local area, even if their work

seems tangential or on the periphery to what you are interested in. As I've come to learn, running a research group relies not only on your research prowess but on your ability to communicate, troubleshoot and manage, and you can gain valuable insights into this process by observing the research culture in all its manifestations across different groups. Above all else, finding your passion and staying authentic are essential.

What do you like most about your work?

I am enthralled by the complexities and mysteries of the human brain, and so being in a position where I am paid to think about and study the brain is my ideal job! I genuinely look forward to going to work every day, to learn from rare patients who generously donate their time to our research and to steer my team members towards hopefully finding a path that they are as passionate about.

No two days are ever the same as the work is incredibly varied and can range from conducting analysis, to writing theoretical pieces, reviewing papers or grants or assisting students with designing new study protocols or tests. Some of my most satisfying days, however, have been applying a new method in the clinic and watching my hypothesis unfold before my eyes. I have a number of very vivid memories of trying to keep my composure as I watched my predictions bear out in a testing session, then frantically rushing back to the office to score and plot the new data. I love watching my students get excited about their own studies and fostering this enthusiasm to ensure they have a rewarding research journey.

On a broader level, I sometimes like to step back and think about the global community of neuroscientists that I am part of and how we are collectively chipping away to try to understand the mysteries of the brain. It is a wonderfully humbling experience to attend conferences and meet some of the luminaries in the field, to establish new connections and to hear that our work is having an impact at the international level. Now, more than ever, the spirit of open science and data sharing means we can collaborate and join forces to tackle some of the big questions in neuroscience, as well as making friends across the globe. For me, there really isn't any better job out there!

And what do you like least about your work?

Aside from the obvious grievances about admin and grant writing, there are times when I do find my work affects me on a personal level. Working with patients who have progressive neurodegenerative disorders is hugely rewarding, but I am acutely aware that, at present, we do not have any viable cures or treatments for our patients. As we conduct longitudinal studies, we end up building up a rapport with patients and their families, and it can be quite distressing to see our patients decline in their

cognitive and behavioural function as the disease progresses. One of the most difficult parts is when we receive notification of patient deaths, as many of us have our personal favourites who we have gotten to know over the years. During those times, I remind myself of why I entered this field – my passion to make a difference, no matter how small, in the lives of people living with dementia. I find my grandmother's memory is never far from my mind, and that gives me the motivation to persist during the difficult times.

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

Looking back on my career path, I realise how lucky I was to scramble back into the academic system and get to my current position without any clear planning or strategy. I think this is a case of being the exception rather than the rule, and I would strongly advise all final-year PhD students to not adopt this haphazard approach. The stress of writing up the PhD thesis can sometimes be so overwhelming that it overshadows everything else, but I think students also need to make a concerted effort to stand back to appraise their medium- to long-term goals, knowing that these are likely to change over time. Having frank and open conversations with your supervisor is also important – we cannot help you if we don't know what your hopes and aspirations are. I have had many interesting and important conversations with students where we simply talk about possible options, paths that might be interesting to pursue, and think about various academic and non-academic options that they might like to explore. This also enables us as supervisors to stay alert to various opportunities that we can recommend you for, as well as being able to discuss potential non-advertised postdoctoral positions with our international collaborators. And something I learned from my own circuitous trajectory is that the big decisions we make in life are actually rarely set in stone, and it is possible to regroup and find your way back to your rightful path.

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

Above all else, be authentic and be yourself. The archetype of the old male white professor has gradually been overthrown, and we are witnessing an inspiring movement towards diversity and inclusion within STEM. As a woman in science, I believe it's critical for the younger generation to see positive examples of successful female scientists and to demonstrate that it is possible to have a family and carve out a thriving academic career – one does not, and should not, preclude the other. As I

gain more seniority in my role, I'm increasingly realising the importance of being kind. Science is often portrayed as a competitive 'dog-eat-dog' world, but some of my proudest achievements have come through collaborating with other scientists from around the globe. So as you ascend through the ranks, remember to look back every now and then, and try to make the path just that bit smoother for the junior scientists coming through.

You've shared a lot of great advice. Thank you so much for doing this interview!