AH what works edited recording\_onetrack.wav

**Sophie Scott 00:00**

Hi, welcome to What Works with Sophie Scott and UCL and what we are going to be talking about in these podcasts are the different ways that we've all got into science, the kind of stuff that we do and what we find works for us in terms of managing our days, managing the other stuff we have to worry about and organising our science. And it is a real pleasure to kick things off today by talking to my colleague, Antonia Hamilton. Antonia, hi.

**Antonia Hamilton 00:41**

Hi.

**Sophie Scott 00:42**

Antonia. Um, can we go back as far as you would like to go back and just think about how, how did you get here? What was your route into sort of choosing science and academia as a career?

**Antonia Hamilton 00:54**

I guess fairly unusually, I decided when I was about 15, that I was going to be a neuroscientist. And so, I did. [INAUDIBLE]

**Sophie Scott 01:04**

What interested you about neuroscience? Can you remember what engaged you at that age?

**Antonia Hamilton 01:07**

Um, I read a book about it.

**Sophie Scott 01:09**

Oh, excellent. What book?

**Antonia Hamilton 01:11**

It was called the Making of Memory.

**Sophie Scott 01:13**

14 Is that Alan Baddeley?

**Antonia Hamilton 01:15**

No, no, it was someone who I can't remember the name. But he was doing research with chicks who were learning about different tastes that were sweet and bitter, and then dissecting brains and all sorts of things. But it just gave me this whole sort of world of stuff that wasn't taught at all at school. Because in the GCSE syllabus, you did, you know, hearts and lungs and guts and this kind of thing, and no one mentioned anything that happened inside your head, and I've always liked doing the stuff that I haven't been taught. So that was what I decided to do.

**Sophie Scott 01:47**

It is interesting. I can remember, I'd left home and was studying biology when I did a course in animal behaviour and I had the same experience. I went, wait, wait, what you can apply the principles of science to actions, this is amazing. Absolute revelation. Fantastic. So, you'd made your mind up at 15 that you wanted to do neuroscience? How did you take that forward? What do you do for, did you do sciences at A-level?

**Antonia Hamilton 02:08**

For A-level, I did chemistry, biology, maths and Old Testament. [LAUGHTER]

**Sophie Scott 02:18**

I could see where you were going there, and then it took quite a marked turn at the end.

**Antonia Hamilton 02:22**

Exactly, that was because I wanted to have a subject that involved writing, not just science, and that was the nicest teacher.

**Sophie Scott 02:29**

Oh, well, that's a good reason. Yes.

**Antonia Hamilton 02:32**

And actually, the course wasn't just Old Testament. It also included a few bits of philosophy, and what they called psychology, but it was mainly Freud. But you know, it gave a bit of a different way of thinking about stuff.

**Sophie Scott 02:44**

Oh, excellent, excellent. And what did you then go on to do at university?

**Antonia Hamilton 02:48**

Then I went to Oxford and did... Actually when I was applying, I thought, I had only heard of psychology in terms of Freud and I knew I didn't want to do Freud, so I thought I was going to do philosophy and physiology, which was available as an option. But everyone said, oh no, that's really hard to get into. So why don't you just apply for the psychology course and then transfer when you get there. And I got there and then discovered that actually, psychology meant cognitive psychology, which was precisely what I'd wanted to do in the first place, but I just hadn't heard of what it was.

**Sophie Scott 03:18**

Yeah, that's fantastic.

**Antonia Hamilton 03:20**

So yeah, that's what I ended up doing.

**Sophie Scott 03:22**

What kind of stuff did you enjoy doing when you were an undergraduate?

**Antonia Hamilton 03:26**

Oh, I liked doing the sort of quite geeky, I guess, human information processing courses and this kind of thing. And then I spent a while as a research assistant in a baby lab, which was quite interesting. I decided I never want to work babies again. They're much too much work.

**Sophie Scott 03:45**

Yes, I can see that.

**Antonia Hamilton 03:48**

But yeah, that was just a good place to get started on things. And I even got a paper out of it, which was quite nice.

**Sophie Scott 03:55**

I don't know enough about the Oxford syllabus; did you do a dissertation?

**Antonia Hamilton 04:07**

Yes, I did. My third-year dissertation was on visual attention. I found a new 200 millisecond reaction time effect that I never got around to publishing and never did anything about since. I always think I should have done.

**Sophie Scott 04:21**

There's something about 200 milliseconds, isn't there? Something about that as an amount of time and cognition that you just keep coming back to. Can you tell me about your effect?

**Antonia Hamilton 04:31**

So, this... I was interested in the idea of is there binding of stuff within objects, so do you bind the colour and the shape together, and things and so I gave people a task where you had a red square or a blue triangle, you hit the left key and a blue triangle or a red square, whatever you hit, you hit the other key. So you can only do the task right if you bind the shape and the colour together, and then you've got this either with the shaping and colour integrated in a single object or with a white shape on a coloured background. And you're far faster when they're within the single object.

**Sophie Scott 05:08**

Yeah, yeah.

**Antonia Hamilton 05:09**

Which kind of makes sense. But at the time, all of the models that I was learning about, the sort of Triesman feature based models, where it's just about, you know, is there a blob of red? And is there a sloping line? And then you could, you know, link those two things, regardless of where they were in the visual scene and how the visual scene was structured.

**Sophie Scott 05:26**

Yes, yeah. And what did you do after your first degree?

**Antonia Hamilton 05:33**

So then, again, I knew I wanted to do a PhD. I didn't really know what in and I happened to meet somebody who was doing... I'd heard of mirror neurons at some point, and sort of started to think you know, well, we haven't been taught any motor control in this course so far, I better go and find out something about motor control. And I happened to meet somebody who was doing a PhD with Daniel Wolpert at UCL and so I looked him up. This is before Google even existed, but just about found a few things, and thought that looks quite interesting. And sent an email and said, Hello, can I come and do a PhD with you? So, I did my PhD on the movement of a single finger, very, very low level, what's the patterns of variability in individual motor neurons? And how does that control the things like individual finger movements.

**Sophie Scott 06:29**

Were you doing that in humans or...?

**Antonia Hamilton 06:31**

In humans.

**Sophie Scott 06:31**

How do you do that in humans?

**Antonia Hamilton 06:33**

You get a force transducer, right? And you can instruct people to push down on the force transducer with different levels of force. And the interesting thing was that as you push down more, you also become more variable. And there's a linear relationship between how much you push and how variable it is, which... and that was a sort of basic principle of how Daniel's computational models of the motor system worked. But the problem is that the noise in individual neurons is not linear. The noise in individual neurons has a Poisson distribution. And so, there was this kind of debate about how do we get linear behaviour out of neurons that are firing with the Poisson distribution. So, I was building computational models of how the neurons were working, and how you put them together, and then comparing those to some experimental data. And we could come up with a nice model that explained all of this.

**Sophie Scott 07:20**

Can you very briefly summarise the model because that's fascinating?

**Antonia Hamilton 07:22**

Yeah. So, the key factor turns out to be the fact that there's a distribution of thresholds within your motor units. So, the motor units that are innovating a muscle, some of them are very low threshold, they'll go when you first start activating, and those tend to be the very small units that just move a teeny tiny bit. And then the more and more you activate your muscles as hard as possible, then you start activating the bigger units. And so, because you've got this distributed range of motor units, you can end up even though each individually unit is Poisson, with getting a linear type of noise out.

**Sophie Scott 07:54**

Fantastic, fantastic. So, you've done visual attention. You've worked in a baby lab. You've looked at incredibly beautiful modelling of the nervous system. What did you do next?

**Antonia Hamilton 08:06**

Then I moved to work with Uta Frith on autism. So another move, exactly. I mean I always say because people always say in terms of careers that, you know, it's a really good idea to move about to different places and things. But I think that that, in a way was the biggest move in my academic career was from that side of Queens Square to this side of Queens Square.

**Sophie Scott 08:26**

Yeah, not physically very far but conceptually...

**Antonia Hamilton 08:30**

Exactly, because, yeah, I had the chance to do a postdoc with Uta working with children with autism. And this was the point when there was a lot of hype about mirror neuron systems and are mirror neurons different in autism and this kind of thing. So, I was trying to develop some studies to test that out.

**Sophie Scott 08:57**

How did you find the move, what was it like going from almost like a...? I keep coming back to the word clean. I want to say clean motor labs. The questions are incredibly well defined in projects. I mean, that might just be my bias. What was it like making the change?

**Antonia Hamilton 09:15**

It was fine. I mean, you know, but in both places, I had very supportive supervisors and lots of flexibility to get on with stuff and things. So it wasn't that hard. And it was a different area, different literature, but not that different. I think I had an advantage because so few people have done motor control. And I could come into this autism area with a great big background in motor control, when people were just getting interested in motor control questions, and actually have some better ways of tackling them, and things that was quite useful.

**Sophie Scott 09:46**

I think it is a real strength if you've got you know, these kinds of quite technical computational skills to be able to take that into different fields can be incredibly powerful.

**Antonia Hamilton 09:58**

Yeah, and that was also the point. So back when I was an undergraduate, I'd worked as a volunteer quite a lot with children with learning difficulties. And that was, again, a really useful thing that I could draw on when I then came to do the postdoc, because we were working with the same kind of population of children, and just the more time you spent with these kids, the better.

**Sophie Scott 10:16**

So, you actually you weren't off just modelling the data, you were collecting the data as well. What was that like?

**Antonia Hamilton 10:22**

Do you mean in my PhD?

**Sophie Scott 10:24**

I mean, well, obviously, in your PhD, yes. When you when you came to the ICA, and you were doing data collection with children in autism, working with the data, what was that like?

**Antonia Hamilton 10:32**

That was really interesting, because we'd be going into schools all over London. And there was me and a couple of undergraduate project students who were working with me and we had to develop the tasks, and then persuade the kids to sit down and do these tasks. And these were children who didn't have much language abilities, weren't normally taking part in research or being cooperative and things, so it was a lot of just a sort of interpersonal skills, I guess, and then looking at finding ways to engage the children and make them understand that, you know, think that these things are fun. Because you can't just tell them what to do.

**Sophie Scott 11:10**

No, that's not going to work, is it. What kind of things did you find?

**Antonia Hamilton 11:15**

So there we found that children with autism showed exactly the same patterns of behaviour as typical children, which is one of these things that sounds like a non-result, it's boring, but actually in the domain of autism, I think that's really interesting. Because there were so many people claiming that these children couldn't imitate actions, that they couldn't understand goal directed actions. And yet, when you go out and test them, you find that their behaviour is... and they will not just getting everything, right, but they're making the same systematic error pattern that the typical children did. So, we could really say that, you know, there just isn't a difference here. They're doing the same stuff.

**Sophie Scott 11:51**

And that's a very interesting point about not just getting things right, but also when it goes wrong, is going wrong in the same way. Yeah, what kind of systematic errors are you talking about?

**Antonia Hamilton 11:58**

So, the typical children imitated actions in a goal directed fashion. So, they would tend to copy the goal of the action, the thing you touch and not bother about which hand to use to do that. And the autistic kids did exactly the same thing.

**Sophie Scott 12:14**

So, they're functionally showing precisely the same kind of, you know, when they get it right, they get it right the same and when it goes wrong, it's going wrong in the same way. Do you think that's telling us something? What important is this telling about autism?

**Antonia Hamilton 12:29**

That's telling us I guess that there are skills that these kids can do, typically, and again, that's something that you can then use for teaching them new skills that you can build on. And that when the children are instructed to copy these tasks, whether it was explicitly copying, where you say, copy me, then they can do it just fine. Because again, the claim at the time was that these kids can't imitate, they can't copy stuff. And that's such an important thing for any child to learn by copying and so we're showing if you tell the kids copy me, then they do it.

**Sophie Scott 13:02**

Yeah. Yeah. So, you've done a PhD in motor control. You've worked now with people with autism and children populations, and you've been doing it in schools, which is hard. What did you do next?

**Antonia Hamilton 13:16**

Then I decided I needed to learn FRMI. So, I went and did a postdoc in Dartmouth in New Hampshire.

**Sophie Scott 13:23**

Oh wow, so we've completely changed.

**Antonia Hamilton 13:27**

So, at this point, just coming to the end of my PhD, I got married and very shortly after that, I then moved to America leaving my husband behind and this kind of thing. But he then got a job in Boston. So, I was in New Hampshire, and he was in Boston, which was not too far away. And yeah, at Dartmouth, I was working with Scott Grafton, who does motor control and imaging. And as a postdoc that was a good place for research. We had an MRI scanner, it was in the basement, you could wander downstairs and scan when you liked, pretty much, and again a lot of freedom just to do stuff. And so, we started using things like a repetition suppression method to...

**Sophie Scott 14:11**

Can you say what that is?

**Antonia Hamilton 14:13**

So, repetition suppression is the idea that when you see the same thing twice in a row or you do the same thing twice in a row, you're going to have a smaller brain signal second time around. And that can be a really useful way to pull apart sort of different detailed representations within the brain. Because we wanted to say, what's the brain system that deals with goal directed actions, but it doesn't make sense to have an action without a goal, you can't sort of see a video of a person picking up a cookie and then see a video of a person doing the same action without the cookie and do a subtraction between those because actually the video without the cookie is taken as a communicative mime of trying to pretend to have a cookie or something, it just doesn't work to subtract these things. So instead we used things like repetition suppression, where you see person taking cookie and then cookie again and then cookie again and you predict the response is going to go down. And then if you switch to a person taking a pen or computer disc or whatever it is, back in the day a floppy disc, then then you get a release from the suppression. And so, using that kind of method, we were able to pull apart different areas of the mirror neuron system. So, we could show that the parietal cortex is really sensitive to the goal of an action. And then the frontal cortex is sensitive to the different kinematic parameters, and to really sort of make finer distinctions within these different brain systems.

**Sophie Scott 15:31**

So, you've been in Dartmouth for a couple of years. You then came back to the UK.

**Antonia Hamilton 15:35**

Yes. So, when my contract was coming to an end at Dartmouth, I knew I wanted to come back to the UK. I applied for every job going and I got one in Nottingham, so I ended up coming to Nottingham, which turned out to be great.

**Sophie Scott 15:47**

Home of fMRI.

**Antonia Hamilton 15:49**

Yes, exactly. They had some very, you know, lots of great scanners and really nice, friendly supportive department. There were three other new lecturers hired at the same time as me, we all got on well, founded a very good place to be a junior person in that first lecturing job, where they're going, you know, it was quite well structured. It was, it was quite supportive. And so yeah, that worked out pretty well.

**Sophie Scott 16:17**

It's really important, that first step into lectureship actually, it is a really, really big deal. You know, because it's not all departments treat new lecturers...

**Antonia Hamilton 16:27**

It was definitely a very big change. And I didn't have much idea about what I was getting myself into in terms of teaching and all of the other things that I needed to do. But I think by luck more than judgement, it worked out very well. And I spent the last couple of months of my postdoc position applying for grants. And I was lucky that when I got to Nottingham, about a month later, I got my first grant. So, I could establish myself straight away with having a PhD student, hiring a postdoc and getting on with some research and things which I think was also very, very useful and I could not immediately be burdened down with only teaching.

**Sophie Scott 17:05**

Did you do some teaching?

**Antonia Hamilton 17:06**

Yes. I taught some second-year labs, a couple of first year lectures, a third-year module, there was always marking, there was tutorials. The teaching was fairly evenly distributed around the department. So, everybody did a bit, but none of it was an impossible amount, which was nice.

**Sophie Scott 17:25**

And what was your first grant to look at?

**Antonia Hamilton 17:28**

So, my first grant was very much following up on what I had done before. So, this idea are there goal representations in the brain and then can we pin down how... Does it matter who the person is performing the actions, does it matter if it's a human performing actions versus an animated shape, and these kind of things. I had my first baby, so that was also quite busy. But again, I was incredibly lucky. I hired a postdoc and so then when I was on maternity leave, my postdoc was able to take over quite a lot of my teaching, which I think was quite useful for him because when he was applying for jobs a few years later, he could then say, I've done all of this teaching and things as maternity cover. And yes, and he kept the lab together essentially when I was off for a bit.

**Sophie Scott 18:26**

My experience of maternity leave was that I didn't entirely completely get maternity leave, there are some things that sort of don't really stop. PhD students don't go away, nor indeed should you just, you know. So, I ended up taking longer than I expected to for maternity leave, but also, I was still keeping involved with work through much of that. I don't know. I know everybody's different. How did it work for you?

**Antonia Hamilton 18:52**

I was still very much keeping involved with work equally. I had a baby who didn't sleep for about 18 months, which was just brutally exhausting. But, yeah, she went to nursery when she was about five or six months and I was getting back to work and sometimes work was quieter and more peaceful than being at home.

**Sophie Scott 19:18**

I can remember Hector sleeping through one night when he was four months old. I was like, Yes, he's finally sleeping through, and then that was it for years and years. [INAUDIBLE] said, Oh, my son didn't sleep through till he was 17. Now I understand the tails of this distribution are quite long, quite wide. Yeah. I am not going to name them, but I do remember coming back from maternity leave and a male colleague saying to me or must be good to get to use your brain again. Do you have any idea how much work it is looking after a baby? Like no attention experiment with distractors and multiple tasks ever gets close to it. It's pretty full on, isn't it?

**Antonia Hamilton 20:04**

It's very exhausting.

**Sophie Scott 20:06**

And how did things pan out in Nottingham? How long did you end up being there?

**Antonia Hamilton 20:12**

So, I spent six years in Nottingham. So, yeah, I had a lab. Nottingham was very good at supporting PhD students. So, I had several PhD students. And we did some research on autism and some scanning. And then I applied for an ERC consolidator grant, which was about looking at brain mechanisms and cognitive mechanisms of mimicry. So, what makes you produce mimicry, what happens when you're being mimicked by another person, that kind of thing. There we wanted to move into the domain of virtual reality and use virtual people to have really well controlled stimuli but have better ecological validity, have things a bit more interactive than what we'd done before using just videos. And I got the ERC grant around about the same time a job came up at ICN, where I'd done my postdoc, and that was the job I'd always wanted, so it came at just the right time to apply for it.

**Sophie Scott 20:24**

And it was great for us at the ICN, because you were bringing in kind of the autism theme along with motor control, and your really kind of clever and coherent approach to using different technical things to help support your research, like your use of VR and motion capture, things like that.

**Antonia Hamilton 21:32**

Yeah. So yeah, that's worked out quite well, really.

**Sophie Scott 21:37**

Here at UCL, so has there been... I mean, everybody finds a different way of managing it, but you're a working parent. Yeah. And there are multiple kind of competing things for your time. Yes. How do you kind of manage your week, your days?

**Antonia Hamilton 21:56**

I have a fairly solid sort of structure to the week, that we always have lab meetings on Tuesday lunch times. And then at home, I have a nanny three days a week who picks the children up from school. So that... And luckily, my husband also has very flexible work. So, there's one evening of the week when he picks the children up, one when I pick them up, and the other three, the nanny picks the kids up. And I always try to always work from home on Fridays, so that I have one day when I don't have people knocking on my door and I can actually try and get on with writing and that kind of thing. But I mean, it's always a bit of juggling. But actually, the one of the things I like a lot about academia is that I'm very much in charge of my own timetable and can set meetings and things in a way that works for me. And when I contrast that with friends or colleagues who are in law, or finance or journalism or any of these kind of things, they have many more constraints in some of these other kinds of jobs.

**Sophie Scott 22:55**

I can remember when I was first... Hector was small and I was going to mother and baby group, I live quite near here and one of the mothers worked in the print side of journalism. And she was having a tremendous battle with her employers because they would not let her return to work without having to do nights. And she had a new-born baby, her husband travelled for work. So, she was having to pay for a nanny to do overnights and it was costing more than her salary and she was being absolutely intransigent. I thought, I'm not having to deal with any of that. I'm not saying it's easy, but I'm not having to deal with that kind of scale of just an impossibility of how you can do the job at all.

**Antonia Hamilton 23:32**

And again, people in medicine and things or shift work, it's far, far harder. I mean, I found the hardest thing in academia was travelling for conferences. Now my children are bigger, then it's fine, but certainly when they were little, it was very, very hard to leave them. And with my second child, I took her with me to quite a lot of conferences. I was a bit more confident that I could manage to travel with a baby, so I gave talks holding her and this kind of thing. But that doesn't work for all babies.

**Sophie Scott 24:01**

No, but it's certainly... I think it is worth bearing in mind the kind of the flexibility that being an academic does buy you and I'm not saying it's easy, but yes, I have one of my favourite papers published at the end of 2006. And I can remember finishing, getting it off to the journal just before I went on maternity leave, and the first author and the last author, me, were both very pregnant at that time, and we did revisions when my son had just been born and my colleague was so pregnant, she couldn't sit at a desk or write. So, she came around to the flat and I was rocking Hector to sleep with one foot while she was... I put a computer on a drum stool so she could reach it. And then we did the final revisions of the paper when both babies were quite small. We walked around Queen Square to get them to go to sleep and then ran to my office to finish and then the paper came out. And, I love that paper because none of that was in there. But the whole thing couldn't be more kind of embedded in two women managing it. Yes. It was, it was sort of amazing. Yeah, but no one ever says all that paper was written by two women as quickly as they could because their babies were [INAUDIBLE]

**Antonia Hamilton 25:18**

Yes, that paper was typing in bed, that sort of thing.

**Sophie Scott 25:21**

It's the beauty and sometimes the tyranny of the academic career is at the bottom line, it's the papers and, you know, all the other stuff, that all falls away from it. That's not there. Yeah. So, if you can cope with some of the other anxieties... The anxieties of academic life, I'm not saying are trivial, but I think embracing some of the flexibilities can really help you sort of see the positive side of it.

**Antonia Hamilton 25:46**

Exactly. And again, the fact that you can work at home in the evenings and you can, you know, do things on your own timetable makes such an enormous difference.

**Sophie Scott 26:01**

So, one of the things that is really interesting about your career is you've got this kind of really sort of computational motor control work. You've worked in schools with children. You're addressing really interesting questions about social interaction and intentions and goals. You're also using VR and motion capture and you're not afraid to ask quite difficult questions with quite technical answers as a way of finding out. If you'd like just to talk a little bit about you know, kind of your view on what, where you'd like to go next, where do you sort of see this progressing? What interests you?

**Antonia Hamilton 26:42**

So, I'm increasingly interested in getting ecological validity. So many of the lab experiments I was trained to do is one person staring at a computer and hitting the odd button and things and that's such an incongruous situation. And what I'm really interested at the moment is face to face social interactions, the kind of things that happen in the real world and how can we get at the neuroscience in that. And I think there's a whole bunch of new technologies now that are letting us start to do that. So one thing is virtual reality, which lets us kind of create semi-controlled social interactions, another thing is functional near infrared spectroscopy, so this is mobile brain imaging, where we can use light to capture cortical activation patterns, it's silent, you can do it while you're walking and talking and engaging in ordinary behaviours. The motion capture I think, is still really underappreciated as a method because now again, motion capture has plummeted in cost compared to what it was five or 10 years ago and putting a motion capture suit on somebody and then recording the details of your behaviour then gives you the potential to get some sort of really proper mathematical models so you know, there's so many studies out there where your videoing people and then scoring the videos, which is slow and inaccurate and really, really inefficient. And now we can do it with mo-cap and really get at the details. Now we're doing that, we’re finding details of behaviour that are there in videos, but people have never coded them or noticed them before.

**Sophie Scott 28:16**

What sort of thing?

**Antonia Hamilton 28:18**

So, we found some fast nodding pattern. So when you're listening to somebody, you do a little teeny tiny nod, which turned out to be really, really systematic just when you're listening and things and yet it doesn't, you know, get coded separately as a behaviour but we think it may be an important behaviour,

**Sophie Scott 28:34**

I'm sitting here nodding, I'm doing it. [INAUDIBLE]

**Antonia Hamilton 28:40**

You become very aware of it. And then one of the really exciting projects that we're setting up at the moment is we're working with actors to understand what's happening in your brain when you're performing theatre on stage, and things like that because the brilliant thing about working with actors is they're experts in social cognition, they're really well, you know, in social behaviour, they're really well trained. And they can do the same thing repeatedly again and again and again, they can go up on stage every night and play these characters again. And so, they're such an interesting group to work with. And we're putting together a performance, it's going to be on at the Bloomsbury Theatre, where we will have actors performing Shakespeare while we're brain imaging them on stage.

**Sophie Scott 29:23**

Oh, amazing.

**Antonia Hamilton 29:24**

It's going to be really cool. It's the 15th and 16th of May. Tickets aren't on sale yet, but they will be soon.

**Sophie Scott 29:30**

Fantastic, brilliant. Really exciting. Thank you. Is there anything else that you'd like to add? Is there anything that you think we could do differently to sort of, you know, if you could change one thing? It doesn't have to be anything you want to change. You know, is there anything?

**Antonia Hamilton 29:51**

I don't know. I mean, I think the thing that I think is... The things that I think are very tough at the moment is finding funding for early career people. I think masters, the master’s is a big barrier for people who can't afford to fund a Masters, because I never did a Masters. Back in the day you didn't need to. And now everyone needs to do a master’s and there's no funding for it, which I think is a big barrier. And then the first postdoc can also be quite a big barrier, there aren't really grants available. And there's an enormous amount of luck in terms of when you're coming to the end of a PhD, does there happen to be a nice PI who happens to want somebody at the right stage, especially if you're tied to geographical locations and that kind of thing. And I think, you know, if I were in charge of pots of money, those would be the kind of things that I think could be worth supporting.

**Sophie Scott 30:50**

I completely agree. I think that there used to be a lot more small pots of money specifically for people spinning out of their PhDs. It's pretty much all dried up.

**Antonia Hamilton 31:02**

Exactly. I know one university, for example, again, would give six-month long grants to PhD students as they finished to write up their papers and launch themselves and apply for fellowships. And that kind of thing would be so valuable.

**Sophie Scott 31:19**

One last question. No-one ever teaches us to be managers in academia and you're very dependent on the experience of the labs that you're in and people do run labs in very different ways. Do you have a philosophy that you would think of as being your philosophy for how to make things work for you, at the lab level, could you tell me what that is?

**Antonia Hamilton 31:40**

I'm not sure I have one. I think I'm pretty relaxed. I think one of the things that I benefited from an enormous amount during my postdocs was benign neglect, to a large extent, I was just told, get on with it, and I went and did it. So yeah, I try not to micromanage people or breathe down their necks, I try to give them opportunities and provide equipment. I see my role as to be, you know, I provide as much funding and as much equipment, as much support as people need. And then I let them get on with it and they've got the opportunity. And some people take up that opportunity in different ways, but that's okay. It's up to them how they want to make use of what's available.

**Sophie Scott 32:23**

Brilliant, thank you. Well, one thing that I like about how you run things, is your weekly lab meeting, isn't it? So, it seems like a real kind of, you know, on occasions when I've been to it, it really, really feels like a unified group of people. It's great. It's a really nice atmosphere. You've done a good job there.

**Antonia Hamilton 32:39**

Yeah, well, I seem to have quite a big group because it's not just the core people that I fund, but then there's several other sort of linked research fellows who are doing good stuff. So, I support them and invite them along to lab meetings and things. Because again, I think these people need to be supported.

**Sophie Scott 32:57**

And it gives a really good atmosphere. There's a lot of different kinds of expertise in the room. It's great.

**Antonia Hamilton 33:01**

Yeah, I like having a lot of variety in my lab. So at the moment, you know, half my people are Computing and Engineering people, but there's still a bunch of people who are doing work with autistic kids and adults and there's, you know, lots of different approaches and lots of different backgrounds is always good.

**Sophie Scott 33:16**

That is, I think that's a real strength. Thank you very much. Thanks for listening. This has been What Works; my name is Sophie Scott.