Nick Jones (NJ)

When they do arrive, will you get a call? Will a helicopter come and pick you up?

Hannah Little (HL)

Yeah, that's. The beginning of Arrival, and I think that that's what my dream is. I'm not sure I'm quite there yet, but that's what I'm basically building my career up to be the person that the helicopter comes and gets, should it happen.

NJ

Well, I hope you get that too, because that would be amazing.

Welcome everybody to this next edition of our Researcher in Focus podcast from the Faculty of Humanities and Social Sciences here at the University of Liverpool. I'm Nick Jones and I'm part of the research and impact team in the Faculty. And today I'm very pleased to be joined by Dr Hannah Little, Lecturer in Communication and Media in the School of the Arts. Today, Hannah will be chatting with us about her work on how scientific information is explained and understood, and the different ways that we can become more effective, more effective communicators. Hannah, thank you very much for joining us. Nice to meet you.

HL

Good to meet you too.

NJ

Thank you. And as a first question, why did you choose this subject? What drew you to this particular area of research?

HL

It's a really nice question because I did my first degree in linguistics at the University of York and I bought halfway through that degree. I it was the 50, you know, it was 150 years the publication of Charles Darwin's origin of Species, and so there was all of these huge events going on about evolution. Engaging people with conversations about evolution, big festivals about it, and I got so into it, to the point where I had a bit of a crisis and I remember going to see my academic tutor at the University of York. So I think I've done the wrong thing. I love linguistics so much, but this is this topic of evolution is really sparking my imagination and I and I wonder if I shouldn't have gone into the science. And she kind of looked at me and said, well, you do know that language evolution is a topic that that you can study here. We've got a whole module on it, and I think. That is the moment that I think has sparked my entire career. From that from then, so I went into language evolution. But it's basically allowed me to study communication from a very scientific perspective. And that has in turn kind of triggered a lifelong passion of learning about science and loving science, but in this context where it's happening in informal contexts outside of formal education, and that's really what most of my research is about now is is getting other people excited about science and. Seeing how best to achieve that.

NJ

OK. And had you been interested in science before Darwin came along and rocked your world?

HL

Do you know? I think. Yeah, I think as a child, I was always kind of torn between artsy subjects and sciences subjects, and I was always very naturally good at science and maths, but I never really had that moment where I realised I was passionate about it. Until. I'd chosen basically to do an arts degree, not that linguistics is purely arts. There's a lot of, you know, very sciency aspects to it. But yeah, maybe I had the realisation too late. But now I feel like I sit on the the wall between science and up, and that's quite a nice place to be, so I don't regret anything.

NJ

Well, I think there's a massive overlap between the science and the arts. I think sometimes we get pigeonholed. Are you going to be scientists? You're an artist, but you can see it in so many different ways that they actually complement each other in lots of different places, though, yeah. Could you tell us a little bit about your academic journey before that brought you to the University of Liverpool?

HL

Yeah, so after I did my degree in linguistics, I went on to do a Masters in language evolution in Edinburgh, which was only about how language evolved. And what I mean by evolution there is is how it evolved in our ancestors. So how we went from our ancestors who had no language to humans who can talk so that degree included biology, mathematical modelling and computational modelling, psychology, anthropology, archaeology and looking at kind of bones of hominids. Altogether in one big degree, that kind of was everything you need to know to to look at how that happened. And then what happened was I wanted to go on to do a PhD, but I didn't manage to get funding, which is something I think that happens to a lot of academics. So they know we very often don't talk about it. And so I had to go and get a job. And the job I went and got was in science communication. So I got a job, basically training scientists to communicate with the public. And I did that job until a year later I managed to get funding to go and do my degree, my PhD in language evolution, but in the meantime grew this massive passion for conversing with scientists training them. And seeing that interface between scientists and the public in lots of different contexts. So I went to Brussels to do my PhD at the Frye University at Brussel in an artificial intelligence lab. Looking at how speech evolved in our human ancestors and how structure and speech might have come about. And while I was doing that degree, I kept doing lots of science communication on the side. So I was doing a stand up some of the English speaking bars, but about linguistics. And other public facing events at some of the international schools there because my Dutch is OK, but not good enough to kind of converse with the Dutch speaking public of of funders in Belgium. And then after that I went and did my postdoc in Nijmegen in the Netherlands at the Max Planck Institute for Psycholinguistics, again in language evolution. And that post Doc. Actually, they hired 10 postdocs at the same time, all to study language evolution, which was incredible because it was 10 people from all over the world. I knew most of them already from academic conferences and stuff, but we were all put in this tiny Dutch town together. To study the same thing, and we've formed a real family. But the downside of that was that it was 10 people who all work in the very, very the same niche field who were all going to lose their jobs at the same time because all our contracts ran out at the same time. And that meant that every single possible job in language evolution had me and all of my best mates applying for it at the same time and the job market for jobs in language evolution just disappeared. OK, I didn't disappear, but there was too many people fighting and it was kind of awful. But I was thinking right, what am I going to do? I kind of want I want to dedicate my life to to the city of language revolution. I I I loved it and I still really love it. But then I saw this lectureship come up at UWE, the University of the West of England in Bristol, for a lecture in science communication. And I thought, well, I know about science communication. I've been doing it for a long time. And basically what I have been studying is is about communication. I thought it was a bit of a point, but I went for it and I. The job. And so I stayed at Britain, at UWE for a while, became a senior lecturer there, had a permanent post.

But I kind of want to be honest. The price of houses in Bristol made me want to move back up north. You could tell from my accent. I'm from the north of England anyway, and I kind of wanted to move closer to family. I wanted to own my own house. Not a big house, just a, you know, a normal size house. And I kind of was a bit disheartened that I'd got to the point of my career where I had a permanent contract. I was a senior lecturer and I still couldn't afford my own home. And so I thought, I want to move north. And post came up here in the communication and media department. I went for it and and they've hired me and so that's how I it's not. Very, you know, academically. Charged answer, but it's been.

NJ

No, but it's it's a pragmatic one, isn't it? And you know, we have to take these things into account and Bristol's loss is our gain and we do have some lovely housing stock in Liverpool, you know, let's be honest, there's some nice houses kicking around if you want to come and live in this beautiful city.

NJ

Now you talked there about studying the evolution of language. Sounds like very much from a kind of almost archaeological kind of of way. You know how we evolve, but you also mentioned in the blog that you sent over that you talk about the cultural evolution of language. Is that different than? What is it in and what does it entail?

HL

I mean, the answer's yes and no. My PhD was looking at how our ancestors first evolved language, but how? But basically what happened right after we started trying to communicate an all language is culturally transmitted. So what that means is basically. We teach each other language, and when I teach you if, well, if you don't already speak language, I know you do. But if you didn't, I could teach you language and that is one step in cultural evolution in. But it also happens, so that would be horizontal evolution because you are not my offspring. But if you were, that would be vertical evolution in the way that biological evolution is. So we pass our language on. When we have children, we teach those children language or they acquire a language. But we can also teach each other language. We get bits of language off each other, and so cultural evolution is basically the transmission of language to other people. And also generations. Now at the early stages of our language, existing that can really, really change our language, you can create new structures, you can expand the lexicon, you can have many, many more words, and that has impacts on. What the Bromma looks like and we can. See that? Types of processes with very early sign languages, and they're really the only context in the modern in modern days that we have brand new languages as well. A deaf community comes together. Who? Have never met before. But what did? Look like for spoken language and that was basically the question my my PhD asked these days what I'm talking about. Cultural evolution. I'm mostly talking about the cultural evolution of scientific information. And that's more about how information changes as it passes from my mind to your mind, to somebody else's mind. So if I see a science story on the news and I and I say. Nick, I saw this really, really cool story on the news. And I tell you the story. That story might change a bit from what I saw on the news. And then if you in turn think, oh, that is a cool story and you go and tell somebody else, it'll change. Again, information changes as it passes through human minds. We pay attention to some bits of information and forget other bits. We might change some bits to make it more interesting, or more surprising or more counterintuitive, so that's what my research is mostly about now.

NJ

And do you think that change sometimes comes about in that context because sometimes people might be trying to discuss something that they don't know an awful lot about, like science is a subject that, you know? Some people don't know an awful lot about and I'm one of them. You know, if I tried to say if I saw a new story about, you know, the latest developments in quantum physics, and I tried to tell you about it, I'd be getting a lot of things wrong. Is it? Is it because of that gap, that knowledge gap, if you like, that change can slip into language?

HL

That and that happens frequently, so in some of my recent experiments, what I do is I tell people stories about science and get them to retell those stories. And then I take their retellings and I tell those. Other people. And yeah, exactly that. What you see? What what you say happens. So people kind of fill in gaps that they've forgotten. It they might say hydrogen, instead of carbon dioxide or something. If they're talking about climate change, that happens all of the time. Yeah. And we know that from when we're telling stories ourselves, we we don't quite remember some detail you say, oh, it's probably something like that. And depending on how honest of a storyteller you are. You either admit that it's a half remembered thing or or or you just say it with confidence. That's the easiest.

NJ

Way sometimes isn't it? So sometimes it's just like a giant game of Telephone? Passing things on and it changing along the routes. OK, it's very interesting. So again, you sometimes you talked about studying the cognitive aspects of storytelling for science communication. What does that involve and what are those cognitive?

HL

OK. So yeah, it's it's exactly what you said. It's a giant game of Telephone. But what I am interested in looking at is what aspects of storytelling make stories. Fixing our minds more or make things memorable for us. So what I did in a recent study is I had lots of different stories about science that had. Different aspects. So some of them were just very dry stories with no human characters about a forest fire starting in Colorado, and some of them had human characters, but just an individual human character. Some of them had human characters interacting. Some of them were really, really negative. Some of them were really surprising. Something weird happened, something that's counterintuitive. And some of them are really survival oriented. So these are all. Different cognitive biases that the existing research tells us. Makes information more memorable. So if you make news stories that are negative, sticking our heads more, we remember them more and and we know this basically from you know if you've ever had feedback, the stuff that keeps you up at night is the negative stuff. Nobody wakes up in the middle. The night and says. Oh, I remember my third grade teacher told me that I was really good at maths. Like that doesn't happen. We remember being told that. Our essay was awful or whatever it is, the same thing's true of of of new stories. We'll remember the negative stuff, and that's basically for evolutionary reasons, right? If something is negative or. Survival based information we pay attention to it more because our survival depends on paying attention to the negative stuff disproportionately to the positive stuff. If we go around just going oh, everything's great, we don't notice when the big threats coming. We need to pay attention to big threats when they happen. And so that feeds into what we remember and what we don't remember. But the interesting thing that I've been looking at now is I've been doing lots of interviews with science communication professionals, talking to them about these biases. And asking them whether they use these biases and if they do. And if they don't, why they don't and been having some really interesting conversations with people where it seems remembering information or information sticking in people's heads. Isn't really the prime like the primary objective of science communication for most people. So most of the time it's trying to get people to change their attitude about something or change their behaviour in some way or raise aspirations in relationship to a certain subject, like getting kids excited about going into science career. And if your goal is to raise somebody's aspiration, just telling them a bunch of, like, really negative stories about science isn't probably going to help. But one of the really interesting things that came out is that a lot of science communicators said that they didn't want to have use some of these cognitive biases that we know mix information, more memorable makes people pay attention to it makes it more sparkly and clickable. And because making information scientific information meet those criteria makes it look more like misinformation. So we know that people who spread misinformation, conspiracy theories. Are using these biases right? We know that they make things based around survival. We know we make, they make them really surprising and counterintuitive. We know they make them really negative and really social and about humans. And so there's now a kind of push back in the science of communication, communication, profession, to try and make our information look not like that. So people trust it more. Which is really interesting.

NJ

It isn't. It is interesting, isn't it? That's like, you know, the bad guys are stealing all of the good the goods, the ways of doing it. So now everything has to look like, you know, a nature article rather than a National Geographic article, you know, or worse. So interesting. That misinformation comes up a lot when I speak to academics. For these these podcasts. So it's not just you having to battle against it.

NJ

Now again, I can't, I suppose can't of leading on to that. You talk about communicating uncertainty and how people might or might not trust recommendations from scientists and engineers. And you touch on it then that we then have to, you know, almost become more boring to to be seen as more relatable. What else are you finding out about that so far?

HL

Yeah. So this is about my new project which has just been funded by an APEX award from the Royal Society. And it's working collaboration with some collaborators in the Department of Engineering, and it came about because I was. I was giving a talk and one of my collaborators was in the room and she came up to me after my talk and she said. If I told you that an aircraft had only been tested in a virtual environment. Would you get on that aircraft? And I said, oh, I don't know. And she said, I want to find out if people's intuition is that they would. Or wouldn't? And if they wouldn't, what would influence them in order to what? What wouldn't finish? Would they need before they they'd be happy to get on that aircraft. So basically they've been doing a lot of research on 0 emissions aircraft, completely new technology that we've never seen. Before in the real. In the world and most of the testing of of these technologies happens in, in, in virtual environments, they don't just build the aircraft nowadays and have loads of test pilot runs, they just do it all virtually. What we know from mostly from data done on the COVID. That. More people understand about the processes involved in establishing some piece of. Scientific. And sometimes the less people trust it, which is counterintuitive, right? So we kind of think that the more information we know about something, the more we. That thing. But what they found during COVID was at the beginning, especially at the beginning of the pandemic where we had all of these statistics, which kind of looked like one in eight people who get COVID will be hospitalised. You probably saw those in early 2020. We didn't have enough information to be making those claims right, but it was important to get messaging out to people about how dangerous the pan the disease was because a lot of people were being hospitalised and a lot of people were dying. And so there was a lot of testing of what types of language or what information increases public trust, what mixes. Act and trust what the scientists are telling us, and one thing I found was knowing a lot about trials and how they work actually makes us trust it less because we can see all the. Uncertainty and there's a lot of uncertainty there, right? We don't know what most of the people with COVID are doing because at that point most people weren't testing. And so there was a lot of unknowns. If people know there's a lot of unknowns, they they trust it less. Which makes sense. But when it comes to virtual testing, is it true that having more information about virtual testing will increase or decrease? So that's one thing. Does knowledge of of of how some information was established. Affect our trust in it, but another thing is what language are we using about it? So I said that one in eight statistics. That's one way of talking about the risk associated with COVID. Another way to do that would be to be give it as a percentage. 10% of people end up hospitalised. Another way would just be to use adjectives to say it's very likely you'll be hospitalised. And there's been a lot of testing done to see how people's language effects their trust in in in those messages. But what's never been done is looking at the types of language engineers are using when they're talking about the outcomes of these virtual tests. And that's what this new research will do is look at how engineers are talking about their certainty around the safety of things like aircraft due to this virtual testing. And then in turn, how do people interpret that so? How do not only the public, but people buying these aircraft policy makers, the government, people who are basically making big decisions about whether we enrol these technologies out? How are they interpreting the language of the engineers are using?

NJ

OK. And given what you've learned so far, would you get on that plane?

HL

Sure. But it's only because I've been talking too people who specialise in in this specific technology for a long time, but yeah.

NJ

You got on the first flight. I'll get on the second. Now kind of following off that you've been looking at how popular cultures such as science fiction can help engage people in. Science and science understanding and that seems to be one of the long standing kind of things that science fiction have done, hasn't it? It's always taken the most that the most up to date technology like Dracula is full of releases technology and Mary Shelley and Frankenstein is full of the latest technology. And you know, we see it today. How have things changed you think from that kind of tradition, if you like? And do you think science fiction has moved closer to the world that we actually live in these days or? Is it still? Aspiration.

HL

Well, there's still lots of aspiration in there, but I think a lot of technologies that first appeared in science fiction do exist now. I mean, you watch old Star Trek and you see them with these communicators are basically mobile phones and sliding doors. We have them now, but nobody thinks about it. That that we didn't have those when when Star Trek. There's lots and lots and lots of examples and what's really nice is when you kind of look at when you ask scientists, why did you become a science scientist? A lot of them say science fiction as a as something that inspired them. An intern a lot of authors of science fiction are scientists themselves. So a lot of the big ones that people. Well, that you'll know. Come from come from science, and I think there's something about being a scientist and thinking about all of those. What? What ifs? You might end up with a lot of what ifs that you can't necessarily use in research because it feels a bit too far off or far fetched. And it's nice that people are just recycling those into.

NJ

Well, I. There's a circular link, isn't there of, you know, people being inspired by? And. Shall we see if we can make this happen? Kind of thing going on, pushing the boundaries now. You've also told us that you have done some work with SETI, that science for extra-terrestrial intelligence. Is that right?

HL

The search for extra terrestrial intelligence.

NJ

Well, first. All before I and you, you look at how we might respond should first contact actually happen. You know, the how language might be used there. So before I ask you how language might be used there, first of all, have we been contacted yet, you can tell me.

HL

No.

NJ

OK, so that's disappointing, but come the day, right? What are the the linguistic things that that we have to think about? I mean a lot of people will have seen the film Contact and things like that.

HL

Yeah, I love Contact because that's a really nice example of of, you know, Carl Sagan and Ann Druyan who wrote Contact like really thought about it. And a lot of the early. Efforts to engage in messaging extraterrestrial intelligence. Was by Carl Sagin and and Ann Druyan and using things like the the Pioneer plaque or the Golden Record, which people might have heard from from the 1970s, were coming up to 50 years of Voyager in 2027, and we're going to have an exhibition at. Victoria Gallery and Museum about it actually. So if people are interested in that, put it in your calendars for in three years’ time. But yes, so basically what they thought about is is thinking about what is it that the aliens will know. And that's a really difficult question, right? Because they're not humans. They don't have our culture. We don't know how they communicate, what they know. And in order to communicate with somebody without even without a shared language, you have to think about what does this other person know. So we're both humans. So if I was trying to communicate with you and we didn't have a shared language. I can do things like. And point to things that I know that you will be aware of so I can, you know, I'm laughing. I know that you probably know what laughing is. We can't do that with aliens because we don't know if they have laughing or if we have or if they. Even the concept of food or drink or anything else, we don't know how they work. So what Carl Sagan did was think, right? If they're intelligent beings in the universe. They've presumably managed to develop radio technology or the ability to like travel through space. They probably are quite good at science, so science is quite a nice place to start. What will they have worked out about science? And then you start looking at some of the the universals so in contact. They communicate using the the frequency of hydrogen, because hydrogen's, the most abundant chemical element in the universe. And so we know that if they're out there, they probably know what hydrogen is. And that's the same thing that they use on the golden record. I've got a tattoo of it actually on my. Of hydrogen in its two forms, and that is the key to unlocking some of the other messages of how to play this this golden record, which includes lots of things about the sounds of the Earth. It's got, like animal communication, human languages on it. Different types of technology, lots of photographs of life on Earth and some some scientific diagrams as well. So basically it's all about thinking about what. The aliens? Know and how can we use that? To start rounding a communication system by establishing right, we both know what we're. Here and then, let's use that as a building block to start communicating more complex things.

NJ

Very exciting. So when they do arrive, will you get a call like will a helicopter come and pick you up?

HL

But yeah. Like the beginning of Arrival. And I think that that's what my dream is. I'm not sure I'm quite there yet, but that's what I'm basically building my career up. To be the person that the helicopter comes and gets, should it happen.

NJ

Well, I hope you get that too, because that would be amazing. Now you mentioned before that you've engaged and done some stand up, so I can't let you go without asking you. What's your favourite science joke?

HL

I thought about this because I'm more. A narrative. Stand up. I don't do one liner.

HL

I thought one of my favourite academic papers actually has a science joke in the title and that joke. How did the chicken cross the Morbius strip?

NJ

I don't know. I did the chicken cross the Mobius strip.

HL

To get to get to the same side.

In order to understand that joke, you have to understand what a Morbius strip is. So it's a 3 dimensional object that only has one side. But the point of the academic paper is one about how we use science comedy to engage the public. And how in order to access what makes a joke funny? You have to be engaging the audience with what they already know, so this links to what I was just saying about aliens. In order for them not to feel excluded by the joke. So if you tell that joke and half of the audience know what a Mobius strip is, they'll laugh and half of them don't know what a Mobius strip is, they'll feel excluded, and they'll feel like they're not part of the joke and they'll feel foolish. And that's not how we want anyone to feel when they come out of our science communication. So. What I. To what a lot of my scholarship about science, comedy now is about thinking about inclusive ways to use comedy, because comedy can be quite an exclusive tool if used incorrectly. Or used without thought. Of how we can use comedy in a way that is inclusive and makes everyone feel like scientists for them.

NJ

That's a very lofty ambition and that kind of leads on to my final question, which would be, given that we're all about impact in the research and impact office, what would you like to see as the most significant change as a result from the work that you've been carrying out in your research?

HL

So my research has by its very nature very kind of practical implications. Anyway, a lot of my research is talking to practitioners of communication. And if you and it's really interesting because if you'd asked me this question maybe a year ago, a year and a half ago, I might have said I want people to be using more of these cognitive biases that I was talking about in their practise. But now I've been on the ground talking to people, practising science communication and the reasons why they haven't. What I now want to achieve is basically more critical engagement with knowledge of these biases and why people are using them or aren't using them and building strategies that takes all of that into account.

NJ

Well, fabulous again, another fabulous unlofty ambition. Thank you very much. So, Doctor, Hannah little. Thank you so much for joining us today. That's been really, really interesting and lots to think about there as well. So it's been a pleasure having you on. Thank you very much. Very much. Thank you. Thank you all for listening, everybody and please join us again for our next edition of our research and Focus Podcast, which will no doubt be coming soon. Thank you and goodbye.