You study children with ‘callous and unemotional’ traits. What are they actually like to work with – it must be hard to connect?
I think these children are a lot easier to engage in research than they are to work with in a school setting, or to parent. They can be perfectly charming. You can have a session where you just wouldn’t know that you are meeting a child who presents with challenging behaviour. They come and take part in research on volunteer basis. This means that the child...
has already made a choice that they want to give time to our project. I think they’re also slightly curious about brains. They often get to have a little outing in London when they take part, or if we test at schools they get to come out of a lesson to meet people they don’t normally see and do something that is relatively interesting and different. So we’re not there to deal with these children’s day-to-day behavioural difficulties, and because we don’t have an ongoing relationship with these children, there is no point in them trying to manipulate us in a one-off testing session.

That’s not to say we don’t experience testing sessions that are challenging, but the challenging behaviours typically relate to co-occurring ADHD features. I saw a boy a couple of weeks ago who had severe ADHD, but who was not on medication. He managed to stay relatively still in the scanner, but that was such an effort that he was crawling under the furniture for the rest of the testing session. So we filled questionnaires together, two questions at the time, and then jumped up and down together, then did two more questions… I got my exercise for that day in the process, but we also got data that we needed and his mum sent an email afterwards saying that the boy felt for once somebody ‘got’ his ADHD.

You’re in quite a privileged position then, because you’re not there constraining, controlling, going on at them about conduct. You’re just interested in them. That’s very true. We only get a very short window of time with these children when we do research, and I know from talking with practitioners and parents that managing a really difficult child can feel overwhelming and hopeless. Yet there are very few children I have met, even the really difficult ones, where I didn’t feel that there could be some hope if there just were the right interventions and resources to support them. We know that children with ‘callous-unemotional’ traits benefit from traditional interventions, but their behaviour is often so severe that additional techniques and resources are needed.

People often wonder whether it is possible to improve these children’s ability to empathise with other people. This is a reasonable question, but I’m not sure that we can necessarily engender empathy, or at least empathy as felt by most other people. But I do think that for pretty much all the children I have seen, if there were the right resources, you could modify their behaviour to be more prosocial. The million-dollar question is how to best do this. Given what we know about how children with ‘callous-unemotional’ traits see the world around them, my hunch is that you may need to socialise them using very different methods than what you would use for a typical child or adolescent. We normally rely on empathy induction, sanctions and social rewards – such as praise and positive emotional expressions – to motivate prosocial behaviour. Evidence indicates that children with ‘callous-unemotional’ traits are less responsive in these domains. This means that we may need to motivate good behaviour by appealing to instrumental benefits for ‘number one’. I often think that the biggest challenge we have in developing new treatments is to get the adults on board in using alternative socialisation strategies, which in many cases will feel really ‘grating’. We have such a strong sense of what is morally right and what sort of behaviour ought to have consequences. If behaviours are truly reprehensible, you feel like the person engaging in them should get their comeuppance.

Discipline can be tough enough with your own children! Yes, and if I think about my own children, one of the things that keeps you going as a parent is that you get something back. Even though they’ve just vomited on you at 3am, or they have the most ridiculous tantrum, what keeps you going is that they hug you, tell you that they love you, want to please you. Not at every moment of the day, but on the whole. Now imagine that instead you have a child who does not just have the odd tantrum, but who you catch doing nasty things to others, lying to you, blaming others, rarely showing empathy and remorse. Further imagine that this child does not often say or do nice things for you, or if they do it’s only to get what they want – how long can a parent keep going with that?

So I often get contacted by parents who are in a complete burnout and have run out of tools to manage their child’s behaviour. In order to get the interactions between these parents and their children on the right track, you will most likely need intensive professional help.

If these children are like that, what is the glimmer of hope you’re seeing? That you can get them to look after number one in a way that is acceptable to society. We may have to come to terms with the fact that not everyone is as empathetic and loving as their peers, but actually it’s in everyone’s interest that they don’t go around actively exploiting and being aggressive to other people.

When you have seen adults like that, do you see the same glimmer of hope in them, or are we talking about a window of opportunity that closes? I think I’m too optimistic to think that it’s ever fully closed, but if you have someone with a criminal history it will be very hard to rehabilitate them to mainstream society. Usually at that point they have years of not being in gainful employment, not having the education they need for that, years of having established certain habits and patterns of behaviour… often they have been able to attract quite a bit of resources with their antisocial behaviour, whether that be sex or power or financial rewards. How are you going to motivate that person, when what you can offer them if they stay...
on the straight and narrow is an unskilled job which doesn't give them status, doesn't give them much money, and probably as a repercussion doesn't increase their chances of having much sex either? That's hard.

A part of your approach is to conduct genetically informative studies. We know that chaotic, violent backgrounds are going to be bad for children. So if you find that some children who develop callous and unemotional traits are particularly vulnerable to the impact of that type of environment, does that really make any difference? We should be putting resources into ensuring those types of environments aren't created in the first place.

Yes, but actually we have less good evidence that those environments are causal for the antisocial behaviour of children who have the callous and emotional presentation. In the children who have low levels of callous and unemotional traits, there is a clear dose–response relationship between the level of harsh parenting and their conduct problems. For the children high in callous and unemotional traits, the association between harsh parenting and conduct problems is less clear. And a 2009 twin design study of ours suggests that what modest association there may be seems to be an epiphenomenon of genetic risk in the family.

That doesn't of course negate your point… clearly we want to be as efficient as possible in preventing abuse and maltreatment, that's just a moral obligation. But there are children from very dysfunctional families who don't develop callous and unemotional traits or conduct problems, and there are those who come from ostensibly very healthy family environments and they still turn out that way.

So biology is not destiny.

It's not, but it gives you a window within which you will likely function. Related to this, I'm very interested in how individuals are active agents in their own environments. We tend to view environmental risk factors as totally independent of the individuals they happen to. In certain cases, for example extreme abuse, that's more than likely the case. But there are a number of social and environmental risk factors that are not independent of the person. Better understanding genetic risk, how that impacts the starting state of a neural system and how that develops over time, can help us understand environment, for example whether a person is more likely to evoke a particular reaction or choose certain environments. This can, in turn, help us think about how we might best nudge an individual onto a different path – for example what are the things which motivate that person that might be more adaptive?

If you're saying the high callous and unemotional children are tending not to be so impacted by the harsh parenting environment, that doesn't necessarily push you down the route of a more neurobiological intervention?

Absolutely not. People often view genetically informative research suspiciously and worry about researchers wanting to push medications or gene therapy. I actually think that the strength of genetically informative research is in what it can tell us about environment.

I think it's inevitable but unfortunate that we focus so much on risk factors. Sadly, risk factors are often things that we can't fully control, and it is not easy to demonstrate the causal mechanisms by which risk factors act – if they are causal at all! Genetically informative study designs can be helpful in understanding whether risk factors are causal and can prevent wasting of resources on interventions that are not likely to succeed. But I actually think the strongest contribution that such research can make is to the systematic study of positive influences, and which ones can nudge somebody to a more prosocial outcome. For example, there's a nice adoption study that shows that chances of developing of callous-unemotional traits can be reduced by warm and consistent parenting – even in children who at biological risk of developing such traits.

But do you think some parents might prefer those biological solutions? If you give parents a choice of giving a hug before bed or an experimental drug that affects amygdala activation, which do they choose?

I think most of them would go for the hug. It's very rare to meet a parent who doesn't truly love their child. A parent may be really short of tools as to how to bring up the child, they may lack an effective way of building their child's self-esteem and making the child feel loved, but I almost never get the sense that a parent doesn't care about their child.

It can be helpful for the parent to think about individual differences that are rooted in biology, and this may help them have more realistic expectations regarding what their child can do and where their child will need help and support. So rather than expecting their child to be exactly like little Timmy who’s just lovely, brings the teacher an apple and never puts a foot wrong, they might think, ‘OK, it's challenging for this child but we can get them on a different track and part of that has to do with me, and I might have these challenges myself… maybe I can now accept a bit of help, if I'm not just viewed as this bad parent who's failing because I don't care’.

How do you go about putting them on a different track then? If they're callous and unemotional, is it those aspects you're directly working on?

Well, there's very little intrinsic motivation for these children, or adults, to empathise with others. If you have high levels of anxiety, you feel lousy. It's just not nice to feel worried all the time. If you have high levels of callous and unemotional traits, you're fine! You're not feeling bad. Most of us experience the affective arousal that comes with the empathy response to other people's distress as highly negative. If you don't have
that negative arousal response, why would you be motivated to seek it out in your everyday life? I am not sure that individuals with callous-unemotional traits would reliably do that.

I do want to return to that hypothesis space… I can imagine if I was a parent, and you say, ‘We’ve identified this cognitive difference, in your child, and a group of children like your child, and this is what rolls out of that, and what we might need to do with them and with you.’ But then you say almost as an afterthought, ‘Oh and by the way obviously this is in part genetic and has neuroscientific correlates in terms of brain activation, because everything does’… it just seems to me that the problem space has been constrained by the understanding of the mechanism without getting the genetic side of it involved at all. I think it depends what you are then going to do with the information about genetic influences. If you’re going to start genotyping all these children and think that’s somehow going to give you something magic – well that’s clearly not the case at the moment. But if you think that genetic vulnerability may constrain particular neurodevelopmental outcomes and may also impact the environmental conditions, then that information could help you think about the child’s development and what they might respond to in a different way. You might also feel less like you are failing as a parent, and more like you have a better understanding of the source of challenges for yourself and your child. You may need special help to deal with a child with particular characteristics and you may also be more readily aware of sharing some of the difficulties that the child suffers from yourself.

Talking of environments, of growth… you recently won the Rosalind Franklin Award, a great honour recognising you as a female scientist. There’s an incredible group of UCL women, exceptionally smart, very supportive, but with an interesting edge… do you think you’ve grown together in your careers, mentored each other?

Obviously the first person that comes to mind in this context is Uta Frith. I do think that Uta is not just a mentor, she actively ‘sponsors’ people. But I think UCL also has an atmosphere that is quite forward-thinking, in terms of women in science and other issues – UCL has always been radical. It was the first university in the UK that was set up to be entirely secular. There is no chapel on the campus. There’s always been a huge emphasis on academic freedom. I think this attracts a certain kind of man and a certain kind of woman. My Heads of Division since I have been here have both been men, but men who have been very active in promoting women in science. When I had my first child and asked to be a little bit more flexible about how I worked, the response from David Shanks, my then Head of Division, was along the lines of ‘I don’t care if you write your papers on the moon, as long as you write them’.

Part of the award is that you have to design a project, to promote women in science.

Yes, it’s an honour to get the award but the project is the cooler bit! My project is to select a group of science ambassadors from GCSE-age children, in collaboration with schools from more deprived boroughs in London. We’re going to ask teachers to nominate girls from a variety of backgrounds traditionally under-represented in science, and the girls will then tell us why they would be interested in this role. The selected girls will participate in a two-day workshop with lectures, practicals and transferable skills training, such as training on interview and presentation skills. Such skills often act as gatekeepers for study and workplace entry. The girls will also be interviewed about their experience, before and after, will write some blogs and will get to interview scientists. We’ll also generate a web resource, which schools around the country can use to find out about careers in science. The hope is that it will showcase science as a viable career for girls from diverse backgrounds, and offer practical tools that may increase their chances of getting into science careers.

Not all academics I meet seem that happy with the state of things, but you seem to plough on.

Oh, I think there are things that need to change in academia, there’s too much emphasis on grant income and the number of publications, too little emphasis on slow science and deep thinking. I see a lot of junior academics thinking about how they can game the system to get money, rather than focusing on what’s the interesting research question. And I cannot blame them, given the current job market and focus on the financial ‘bottom line’. And diversity is a big issue… I’ve tried to persuade some incredibly promising undergraduate students from BAME backgrounds to stay on and do a PhD, but they often feel that they want careers with a stable income. If you don’t come from a background where your parents can support you financially should there be a gap in your income, then it is entirely rational to view PhD and postdoc as a very risky career route. I think there should be grant funding for early-career researchers that lasts up to eight years and can be transferred across institutions if the researcher makes good progress. This might incentivise people from less well-off backgrounds to stay in science. Currently we are not able to retain these students, and this is a huge loss to psychology.