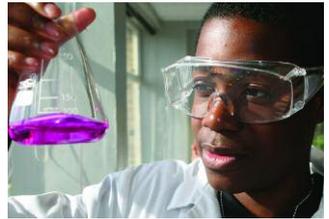




# the s factor

Where science meets you



**PROJECT  
REPORT**

# Amelia Waddington

PhD Student, University of Leeds

The brain is amazing, a collection of billions of cells which work together to create love, fear, intelligence and reasoning. I'm working towards a PhD in computational neuroscience, using computers to try to understand the building blocks of this incredibly complex system.

Through computer simulations, I investigate how the connections between each cell change over time. This work will hopefully lead to a greater understanding of learning and memory.

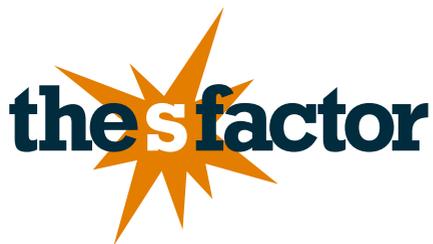
I did my first degree in cognitive science, which is about seeing how the brain works by finding out what goes on 'under the hood', rather than through observing and describing behaviour as in psychology. I went into science because I wanted to make new discoveries. I'd worked for a while in industry after my A levels, but it wasn't enough for me – what motivates me is finding out new things that nobody has known before.



Amelia took part in the S Factor's media training day for women scientists.

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# what was it all about...

Making science enjoyable, accessible, inspirational and fun was one of the basic principles behind the S Factor.

The project – funded by the UK Department for Business, Innovation and Skills through the Transformation Fund – was about engaging adults with science, giving people the chance to take part in debates, learning something new and being inspired to learn more.

At the same time, the S Factor overturned traditional stereotypes of science by giving women scientists a platform and a voice.



The project brought together a new partnership. Led by the UKRC, it included two science museums (Museum of Science and Industry Manchester and Thackray Museum, Leeds), Otley Science Festival and South Leeds Community Radio with Vera Media.

S Factor events took place in community centres, science museums and science festivals – attracting a wide range of people from different backgrounds. Community events in Wythenshawe and Beeston were able to bring in people who wouldn't normally choose to learn about science – particularly low-income learners and those from black and ethnic minority backgrounds. A science café in Leeds targeted a hearing-impaired audience.

The format of the events was as wide-ranging as the venues, again designed to attract all kinds of adult learners: radio phone-ins, public debates with high-profile figures, interactive science workshops on topical issues, a comedy show and science Q&A sessions in café settings. In total, over 1,000 people took part.

The project provided a chance for the organisations involved to learn as well, sharing new ideas on ways to get adults interested in science and – through gender equality training run by the UKRC – gaining a better understanding of why women are still under-represented within science and how they can make a difference through the work they do.

Twenty women scientists were trained in media and public speaking skills, and were invited to take part in the S Factor events, often their first experience behind the microphone. The S Factor experience aimed to give them the confidence to do more events in the future and to act as role models to encourage more women into science.

## The Project Partners

# Claire Pickerden

Project Development Manager, the UKRC

I've always believed that women are central to the workplace and to our economic future and have the absolute right to be regarded as equals in today's society. The UKRC works with both employers and women to show that women are a key source of skills, talent and enthusiasm which science, engineering and technology can't do without. I've met many inspiring women scientists in the UK, Europe and across the world in my work for the UKRC, who clearly demonstrate how science can be both rewarding and fun.

The S Factor brought science to an adult audience in an informal, informative way, whilst profiling women scientists. This was a unique partnership between the UKRC, museums, a science festival and community radio and we learned a lot from each other in a short space of time. We'd like that learning to continue, for adults to engage in science and for women to fulfil their ambitions to work in science, engineering and technology.



"As lead partner and project manager, I was delighted by the support from our partners, the enthusiasm of the women scientists and the reaction from the public."



#### The Project Partners

## Al Garthwaite

Director, South Leeds  
Community Radio and Vera Media

I run a community radio station in what is considered an area of high deprivation in South Leeds. We are involved in a wide range of community outreach activities alongside others in Beeston, but this is the first time we have been able to offer local people the chance to get involved in, and find out about, science.

Most people here have had nothing to do with science since they were at school, and many had little or no science education even then. Yet the S Factor events have been met with enormous enthusiasm. I think the range of events, their quality, the excellent speakers, our use of radio and other media to get the message out - all this has breathed life into the initiative and generated considerable interest. Profiling women in science has been particularly rewarding. I know it has expanded people's horizons, and I hope we will be able to continue in some way.

"This has been one of the best projects I have participated in due to the range of partners and the excellent leadership from the UKRC."

## Adults want to learn about science too - the Science Café

Twenty-four people attended the South Leeds Community Radio S Factor Science Café held in March 2010, at Hillside Community Centre. The evening event took the form of a three course meal with presentations between courses from women who are successful scientists.

Unlike previous S Factor events, numbers were limited due to the more formal catering arrangements and also in order to encourage more in-depth discussion from the audience. The attendees, from across diverse ethnic groups, were sent a personal invitation to encourage uptake. Emily Cummins talked about her inventions, including the sustainable fridge, and Dr Catriona Morrison spoke on language and memory. A general discussion on science followed, ending with an overwhelming agreement to try and hold future café events looking at diverse science topics from dementia to wormeries.

The Science Café at Thackray Museum saw Dr Rachel Airley talk about her work on cancer and Dr Ruth Brooke on the impact of hearing loss. The predominantly hearing-impaired audience enjoyed the event. 'The school I attended was non-academic – science wasn't on offer! So it's lovely to have the opportunity to hear lectures explained in an understandable format – and having the loop system was an added bonus – more please!'



# Adults want to learn about science too - the Science Show

Science engagement is often targeted at children – get them young and they’ll hopefully stay interested in science all their lives.

But the S Factor wanted to show adults – especially those who wouldn't normally be interested in science – that learning about science can be fun and useful.

For the project, the Manchester Museum of Science and Industry (MOSI) adapted one of their science shows for children – ‘What a load of rubbish’ – for an adult and family audience and brought it out of the museum and into community centres in Manchester, Otley and Leeds.

Packed with entertaining and interactive quizzes and games, the show looks at all the rubbish we throw away, where it goes and what we can do to make it less of a problem. The show is fun and easy to understand, but it also carries a serious environmental message.

At the Hillside Community Centre in Leeds, MOSI teamed up with South Leeds Community Radio to run the shows. Leafleting in the area brought around 100 people to the event – with food, craft activities for the kids and information stalls to make it a full day out.

Just over half of those who came were women, with 40 per cent from ethnic minorities. Over 95 per cent enjoyed the show, said they'd learned something new and would now be more careful with their rubbish. Nearly 80 per cent said it had made them want to learn more about science.

An evening performance in Otley also drew in a lively audience with Harriet Wood from Friends of the Earth, Wharfedale and Emma King, Recycling and Waste, Leeds City Council rounding off the event with factual information and discussion.



## The Scientists

# Emily Cummins

Inventor and engineer

When I was four, my Grandad gave me a hammer and began to teach me how to make toys from scraps of materials. My interest in sustainable design was born.

My latest innovation is a sustainable fridge which is 'powered' by dirty water but keeps medicines or small food items clean, dry and cool. After refining it in Namibia, I gave away the design plans in townships across southern Africa because I wanted to enable as many people as possible to build their own fridges.

I took part in two events – talking to people about my inventions. I love it that the S Factor is reaching adults, so they learn how exciting science is and can share that with their children and others.

My science is about changing the world, and this project is helping show just how relevant science is to the world we live in. And as part of it all, it's great the project is giving a bigger profile to women scientists

Emily took part in Otley Science Festival and a Leeds Science Café.



## The Scientists

# Damilola Adelekan

Mechodronics Engineering,  
University Centre at Blackburn College

Being a big fan of Formula One (F1), I decided to do my research project on KERS (Kinetic Energy Recovery System) cars. This is a new, green technology which is being tested in F1 to improve the race and make it more environmentally friendly.

F1 cars recover and store energy from the back wheels during braking and the energy can then be reintroduced into the car's drive-train. The driver can activate the system through a boost button to give the car extra energy when they choose within the race.

This year, as part of the S Factor, I attended a media training day which turned out to be a real eye opener. It made me realise how passionate I am in my subject areas and that I can easily get carried away! Then I was a guest blogger for the UKRC, which was fun. I'm hoping, thanks to the UKRC, to find more opportunities to build my profile as a young woman in SET and as an engineer.

Damilola spoke at the S Factor final seminar.



# Adults want to learn about science too – using community media

South Leeds Community Radio and Vera Media recorded questions about space science from 35 community groups, to put to leading space scientist Dr Maggie Aderin-Pocock when she visited Otley and Leeds.

Maggie answered 27 questions, and discussed the issues with community members during a stimulating studio session. Editing resulted in five programmes, broadcast on air, available as podcasts, and promoted through the Community Media Network.

Adult women learners took photos and interviewed people at the Otley Science Festival – the first S Factor event. These and other S Factor event photos are up on the South Leeds Community Radio website.

Science demonstrations at the South Leeds Christmas Fayre were photographed and filmed, then members of the public, and scientists Dr Liane Benning and Rajni Bhardwaj were interviewed about their reactions. The DVD includes S Factor partner Marty Jopson demonstrating science with bangs and splashes!

The Science Café starring two women (Emily Cummins and Dr Catriona Morrison) was photographed and a radio recording made of the whole event, also on our website.

Our S Factor page receives many hits.  
[www.southleedscommunityradio.org.uk](http://www.southleedscommunityradio.org.uk)

# Finding out about science – where do you go?

182 people filled in our S Factor questionnaire at events or on the UKRC website. These are some of the findings:

More than half hadn't studied science for over 20 years – and 86 admitted to knowing nothing, just the basics or only a bit about science.

Renewable sources of energy, global warming and eliminating incurable diseases were the three issues that concerned people the most. Asked to pick just one, it was global warming.

People found out about science mainly from TV, museums, books, magazines and websites. Newspapers, science festivals and events, and the radio were also popular sources of science information.

An inquisitive lot, over 150 wanted to know more, advising us to attract people to more science events by making them relevant and topical, entertaining, fun and accessible – and advertising them as widely as possible.

## Views on the S Factor events...

'Fun but serious.'

'Down-to-earth, interesting and fun.'

'Easy to understand, clear explanations.'

**'Taking part and watching people be happy.'**

'Good food, good venue and interesting speakers – what more could we want?'

**'Excellent event, sound reasoning.'**

'Helps people from different cultural backgrounds living in a community to come together.'

**'The presentation was first class.'**

'Spoken in language we could understand.'

## The Scientists

# Rachel Airley

Senior Lecturer in Pharmacology,  
University of Huddersfield

I always dreamed of being a scientist. At school I used to imagine being the next Marie Curie or Rosalind Franklin, who would cure cancer and win a Nobel Prize. When I qualified as a pharmacist some years later, I knew that I wanted to develop a career in drug discovery, and although I'm still a long way from winning that prize, I am fulfilling my ambition to work in cancer research.

My research focuses on the unique conditions found in tumour tissue and the way cancer cells adapt and adjust their metabolism of oxygen, sugars and fats to survive and even flourish in these conditions. I feel very lucky to be a scientist, as I get a real buzz from seeing my ideas grow and develop into something that could contribute to real improvements in cancer treatment. Whether attending an international conference, writing a research article or experimenting in the laboratory, I know that I am making an important contribution and I am never bored!

Rachel took part in the S Factor media training day and spoke at a Science Café.



## The Scientists

# Ruby Raheem

Research Student,  
University of Edinburgh

About one in six couples in the UK and around the world are unable to have babies naturally. Infertility clinics have helped many couples to realise their dream of having a child. Yet there are many more couples out there that medical technology has not been able to help, because there is still so much we don't know about the science of 'life'. I'm a mature student, studying the DNA quality of live sperm cells using Raman spectroscopy, work which could lead to a technique for identifying healthy sperms for infertility treatment. It's an exciting area of work to be in.

As a child, I enjoyed problem solving and so took to mathematics and physics at a very early age. While I enjoyed botany, there was no opportunity to combine physics and botany, so I decided to stay with physics. The twenty-first century is an exciting time to be doing science and research, especially at the boundaries of physics and life science.

Ruby took part in the S Factor media training day for women scientists.



## The Project Partners

# Iain Morley

Learning Manager,  
Museum of Science and Industry, Manchester

MOSI's mission is to make science and industry inspirational and particularly to highlight the major and continuing contribution made by scientists from the region.

Our involvement in the S Factor saw us delivering one of our popular science shows at venues across the north of England with each of the partner organisations. This has been a great project to be involved with as it has given us the opportunity to work with a wide range of people beyond our normal audiences and took us outside of the Manchester area.

Because the partnership has been a mix of community organisations, science communicators and museums it has been interesting to see how other organisations work and also the scope of what they do. Being able to support them in their aims through the delivery of our science show has given us the chance to explore how we can develop our delivery of the show in the future.

The S Factor gave us a great opportunity to find out about approaches to adult learning and ideas on how to work with different communities.



## The Project Partners

# Dr Marty Jopson

Otley Science Festival Organiser

The Otley Science Festival grew from a conversation I had with one of the directors of the Otley Courthouse, the town's arts and resource centre. The first festival was in November 2008 and since then we've run dozens of successful science events where none existed before. We've discovered that our local community is hungry for science and we attempt to satisfy it. The festival is now run by a small team of dedicated volunteers.

The S Factor has been good news for us. It has enabled us to arrange very popular, free events that extended out from our original week-long slot in November. We have found new audiences and new ways of engaging with the community. Furthermore, we have found new partners in science around the local region that will allow us to grow as a popular science festival.

In the S Factor, we attempted, and succeeded in targeting three different groups of adults - those interested in comedy, the serious science policy audience and parents of children.



## When the S Factor met Question Time

What percentage of the male and female workforce in the UK work in science, engineering and technology? That was the question put to the audience at the Question Time-style debate on Science, Policy and Power hosted by the S Factor at the Otley Science Festival.

Most guessed 10 or 20 per cent for men (it's actually 30) and 10 per cent for women (it's just five).

The question sparked a stimulating discussion between panel members Professor Anne Glover, Chief Scientific Adviser for Scotland, Nick Dusic, Director of the Campaign for Science and Engineering, Professor Nicola Spence, Chief Executive of Science City York and Phil Willis MP, Chair of the House of Commons Science and Technology Select Committee.

The audience also voted on a quota system for women on public boards (57 per cent in favour) and involving more adults in science (60 per cent thought this very important).

Both Nicola Spence and Phil Willis identified breaks to have children as a key factor limiting women's research careers in science. When the panel were asked what they'd do first if prime minister, Anne Glover suggested an obligatory three months paternity leave, to balance family responsibilities.

Safeguarding science and engineering research funding got everyone's agreement. Anne Glover suggested appointing a female Chief Scientific Advisor for England and Nick Dusic wanted to see her based in the Treasury to ensure science was given the priority it deserved.

## The Scientists

# Professor Anne Glover

Chief Scientific Advisor for Scotland

When I was a young girl, my brother was given a chemistry set for Christmas. He wasn't that interested but managed to create a big explosion in the kitchen. When I saw that, I thought, 'that is for me'. I've been excited by science ever since.

Every aspect of our lives is covered by science, from the minute we get up until the minute we go to bed but it is not easy for us to recognise. We need to make science accessible and let the whole of society have a say in science. If we can truly embrace science as part of our culture it would be incredibly exciting. We are all born scientists - we need to get stuck into science and have some fun.



# Women in science – who springs to mind?

Of the 182 people – 122 of them women – who filled in our S Factor questionnaire at events or on the website, 147 were able to name a famous living scientist. Stephen Hawking took the top spot at 66 mentions. Only seven people thought of a woman scientist.

Asked to name a living woman scientist, the picture was a bit different. 64 people were able to do so, but only 24 could name a 'famous' woman: Susan Greenfield, Maggie Aderin-Pocock, Alice Roberts, Kate Humble, Jocelyn Bell Burnell and Heather Couper were mentioned most often. The rest were simply lucky enough to know or work with women scientists – one person even named their GP!

## **How can we increase the numbers of women in science, engineering and technology? People told us...**

'Traditionally it was a man's world, but women are making their mark.'

*Female, 50-74*

'We need more women scientists as speakers and role models.'

*Female, 50-74*

'It begins at an early stage. Young girls need to be encouraged to take on these subjects; education is the key.'

*Male, 25-49*

'Women start out in science careers with as much expectation as men. They aren't unsuited or less talented, but the system prevents as many women as men progressing. Until the system changes, this will not change.'

'Girls are still too influenced by unscientific media and cultural upbringing: science isn't sexy for girls.'

*Female, 25-49*

'It is difficult for women to progress in their career, even the most able and ambitious. Men have the power to promote or block progression and tend to prefer other men for positions of responsibility.'

*Female, 50-74*

'Confidence is a key factor; many girls and women haven't the confidence to take part.'

*Female, 25-49*

'It will improve in future! We have not, in the past, given girls the same options to choose science in schools.'

*Female, 50-74*

## The Project Partners

# Sarah Clement

UKRC Associate and  
Gender Equality Trainer

The UKRC's Gender Equality Training looks at the contributory factors behind persistent under-representation of girls and women in science and at practical ways to make a difference and improve women's participation and progression. It explains why we need to challenge gender stereotypes and unhelpful attitudes about women's 'interest' and 'suitability' to participate and progress in the sector and it provides organisations and individuals with the tools to develop and mainstream good gender equality practice.

The S Factor training sessions focused on raising awareness among the partners of the need to challenge gender stereotypes and how to embed good gender equality practice into their community outreach and engagement activities. The training is great because it uses real-life examples and encourages lively discussion about the issues. I enjoy it for the questions it raises whilst providing practical solutions. It was very rewarding to work with a diverse and unusual partnership of organisations.

### Partners found the training...

'Very useful to review the current situation regarding women in SET and I welcome the idea of community based science events.'

'One of the best training sessions I've attended, good mix of practical activities.'

'All very useful – practical focus, gives ideas for future action that I can take and resources to work with.'



## The Project Partners

# Almut Grüner

Chief Executive,  
Thackray Museum, Leeds

For anyone with even the tiniest interest in medicine or health, the Thackray Museum is the place to go. 'My' museum has everything from weird medicines to artificial limbs, from Roman surgery knives to endoscopy, and from public health acts to the MMR scare.

The Thackray Museum is also the place that made me – from my background in museums, rather than science – think about how important science and scientific research are. I now make my own contribution by encouraging more people to take an interest in science, or even become scientists themselves.

I firmly believe that everybody is open to learning. It's not so much about 'talent' than about encouraging someone to find their own way of learning – which is what the S Factor was all about. I think it is important that more girls are encouraged to take up science in school and beyond – and if my museum can help make it happen, that'll make me proud.



# Learning from experience...

Just as those who came along to S Factor events learnt more about science through taking part, so the partners in the project learned a lot from working together on the mix of events.

## **Science is engaging**

- Community groups appreciate talking about something new, not commonplace topics such as crime or litter.
- People are inspired by interesting science events and want more.
- Timing events in afternoons and early evenings is great for family audiences.
- Questionnaires are a hit, especially if incentivised with a raffle; so is interactive hand held voting to engage the audience in debates.
- Tweeting, blogging and on-line surveys help spread the word.

## **Partnerships bring extra benefits**

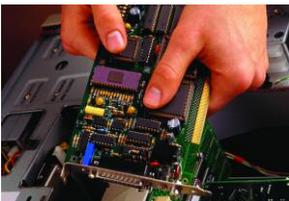
- A sparky and focused partnership can achieve a lot in a short time.
- Big museums and small community organisations both face the same issue: getting more and different people through the door.
- Gender equality training for partners is fantastic for staff development.
- Bringing big names into local communities is great for community esteem.
- Partners provide new audiences, new contacts, including for speakers.
- Provide as many chances to share knowledge as possible.

## **Timing is key**

- If grant award is made late, shortened timescales have lots of knock-on effects.
- Running a shorter project means it builds momentum just when it is coming to an end.
- It's hard to squeeze ten months of activities into five – people are left wanting more.
- Some partners will be unable to come on board, if a new timescale no longer fits their activities.

## **Publicise and advertise**

- Work hard to get media interest in events like these as it's not an easy nut to crack.
- Get marketing out early – if timescale is shortened this can be problematic.
- Use lots of ways to advertise – 'pupil post' to primary schools, door-to-door leafleting, event literature
- Free tickets can be counterproductive – some people won't turn up!
- Make as much as possible of online marketing – blog, twitter, vodcast and podcast.



## The Scientists

# Diane Davy

Management Consultant to  
the engineering sector

My role is something of an interpreter: I work across sectors to help engineers, scientists and technologists understand more effectively the organisations they engage with and vice versa. Often an organisation knows what it wants to achieve, but isn't sure how to do it so I provide an analytical approach for an innovative solution. For example, last year I did a Mystery Shop for 16 engineering institutions, resulting in useful advice on how to develop a user-friendly approach to the engineers and scientists who want information from them. I also talk about the value of science, engineering and technology to society and the importance of strong science in schools to educate the technical people of tomorrow, who will be the providers of solutions to global issues. The UKRC has an important role in ensuring women play their part in becoming these technical people, too.



Diane took part in the S Factor media training day for women scientists.

## The Partners' details

### The UKRC

The UKRC works to improve the participation and position of women in science, engineering and technology occupations across industry, research, academia and public services, to benefit the future productivity of the UK and the lifetime earnings and career aspirations of women.

[www.ukrc4setwomen.org](http://www.ukrc4setwomen.org)  
[info@ukrc4setwomen.org](mailto:info@ukrc4setwomen.org)  
01274 436485



### Museum of Science and Industry Manchester

Located on the historic site of the world's oldest surviving passenger railway station, MOSI's mission is to make Science and Industry inspirational, highlighting our region's rich and continuing contribution. Our vision is to be a world class cultural attraction right at the heart of everything Manchester has to offer.

[www.mosi.org.uk](http://www.mosi.org.uk)  
0161 832 2244



### Otley Science Festival

A lively programme of science events, suitable for all ages. Whether you are new to science or already hooked there are activities to enjoy, explore and discover. The Festival is based at Otley Courthouse, a unique development run by local people in the attractive market town of Otley, in easy reach of Leeds. The old magistrates' court has been transformed into a fully accessible centre: a week in November is dedicated to science, with other events through the year.

[www.otleycourthouse.org.uk/science-festival/](http://www.otleycourthouse.org.uk/science-festival/)



### South Leeds Community Radio

A community radio station broadcasting in South Leeds and over the internet, offering informal learning to adults, as volunteers and in regular sessions, in partnership with its founder Vera Media. The radio station creates material for podcast, on CD and other delivery platforms, for dissemination across the UK and beyond.

[www.southleedscommunityradio.org.uk](http://www.southleedscommunityradio.org.uk)  
0113 387 6464



## The Partners' details



### Vera Media

The Community Media Base in the Hamara Centre, Leeds offers free opportunities in a wide range of multimedia skills. Learning provision includes ESOL (English) with video; designing and sewing a tapestry, filming and editing DVDs and digital photography.

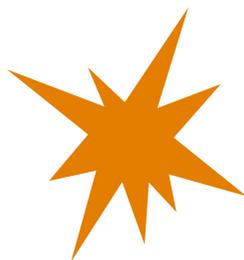
[www.vera-media.co.uk](http://www.vera-media.co.uk)  
0113 387 6468



### Thackray Museum, Leeds

An independent medical museum that tells the story of medicine to a wide audience through exhibitions, schools programmes, family activities, outreach sessions and a historical lecture series. The Museum contributes to the understanding of medical history and people's health with innovative programmes that engage, fascinate and encourage debate.

[www.thackraymuseum.org](http://www.thackraymuseum.org)  
0113 244 4343



**The S Factor was a partnership project run by:** The UKRC



**The project partners were:** The Museum of Science and Industry, Manchester; the Thackray Museum; Otley Science Festival, South Leeds Community Radio and Vera Media.

