



**Featured stories:**

REF 2014: Bournemouth University's research recognised as world-leading

Improving nutrition in cancer survivors

The genetics of psychiatric disorders

Standing up for banking for the public good

Seen but seldom heard

**Informal Enquiries**

Research and Knowledge Exchange Office:  
**Telephone:** +44 (0)1202 961200  
**Email:** [research@bournemouth.ac.uk](mailto:research@bournemouth.ac.uk)



## Welcome to the Bournemouth Research Chronicle

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# Welcome to the Bournemouth Research Chronicle

2014 was a significant year in the development of research at Bournemouth University (BU). With the recruitment of over 50 new academics and a substantial growth in grants income, research at BU is going from strength to strength.

This was reflected in our outstanding Research Excellence Framework (REF) results, which saw 96% of BU's research rated at an international level, with 18% deemed to be world-leading. Our results are a credit to the outstanding work which goes on at BU on a day-to-day basis. Everyone at the university can take pride in these results, as we have all contributed; whether through the direct submission of work or by building an environment and culture that allows research to flourish.

We are particularly proud of the way that BU's academics continue to lead the way in developing research that not only impacts on society, but also is made openly available for others to use. Publishing research open access allows for a wider range of people to benefit from its discoveries, so we are pleased to see that BU's academics are already taking steps to share their work. The academics featured in this year's Bournemouth Research Chronicle (BRC) have a variety of reasons for being passionate about making research freely available, and as their stories show, it has already helped their research have an impact on beneficiaries, businesses and early career researchers.

Some highlights featured in this edition include research undertaken by the Faculty of Health & Social Sciences about managing fatigue in people with multiple sclerosis (MS). Thanks to collaboration with the MS Society, hundreds of people with MS have now benefitted from

training and support to better manage their symptoms (page 10-11). Other research projects have helped shape the direction of national policy, such as research from the Faculty of Media & Communication into the copyright implications of consumer 3D printing (page 24-25).

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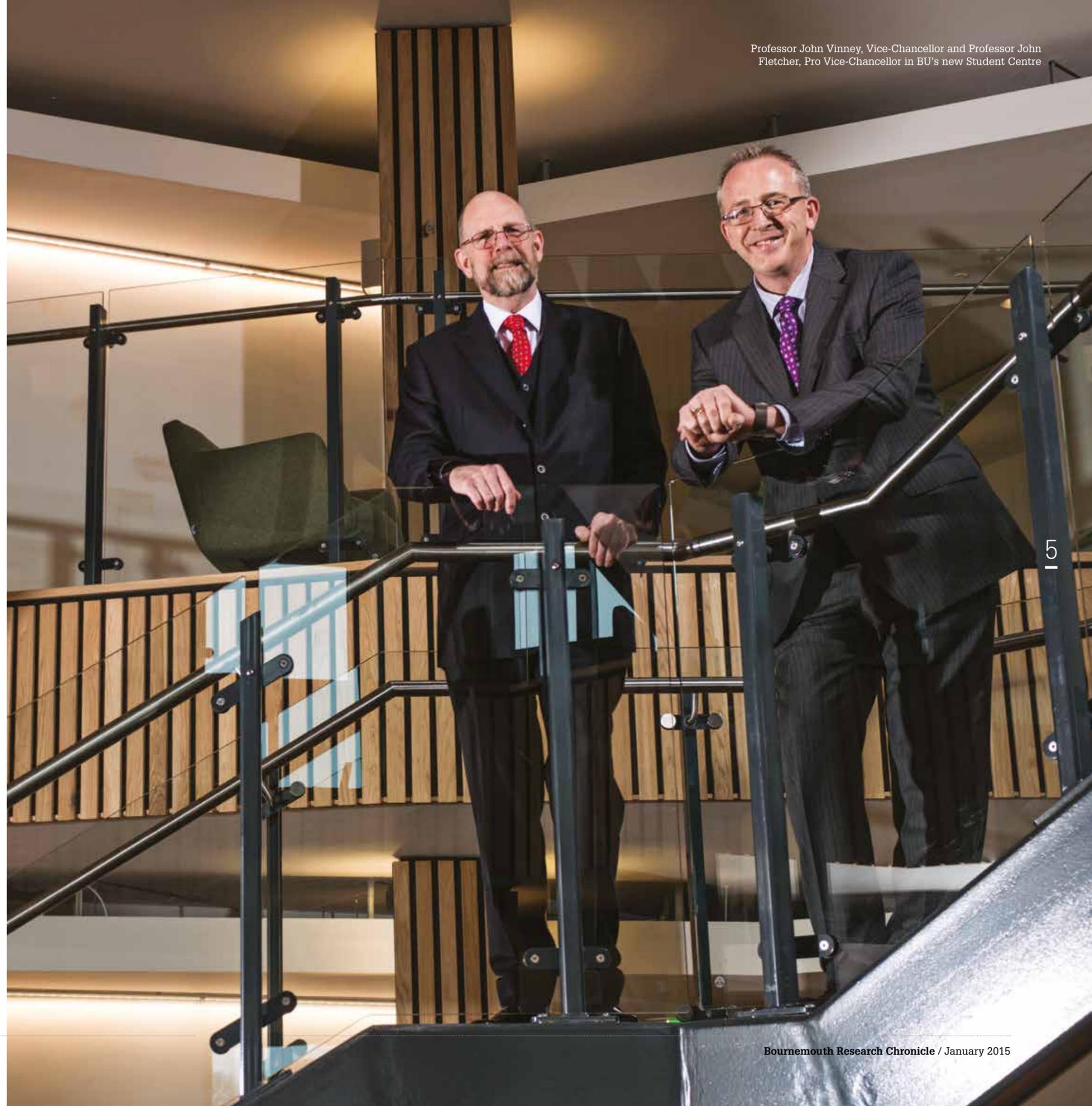
"Everyone at the university can take pride in these results, as we have all contributed; whether through the direct submission of work or by building an environment and culture that allows research to flourish."

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As well as making a difference to the outside world, research plays a big role in enhancing life at BU. Collaborations between researchers from different faculties create opportunities to bring together ideas and develop new areas of expertise; something we hope to see more of in coming years. Research is also benefitting our student experience through the launch of BU's new undergraduate research assistantships, which give students a fantastic insight into research as a career. It also helps them to develop skills, which will be an asset no matter what profession they choose.

As research continues to flourish at BU, we look forward to seeing its impact both in the wider world and in our own university community. We are proud of the work that is undertaken at BU every day, and are delighted to introduce a small selection of excellent examples of research in this year's BRC.

**Professor John Vinney, Vice-Chancellor**  
**Professor John Fletcher, Pro Vice-Chancellor for Research and Innovation**



# Open access publications from 2014

**P**ublishing research open access enables findings to be used and widely shared beyond the academic world.

This year's BRC features academics who are passionate about open access and have already begun to freely publish their work, enabling others to benefit from it almost instantly. Their reasons for doing so are diverse – some are enthusiastic

about education and knowledge sharing, others want to help progress the careers of postgraduate students and early career researchers, while others want to make sure that their research has the biggest possible impact on people who might benefit from their results.

There are two ways that researchers can publish their work open access. The 'gold route' of open-access publications is to either publish in an open-access journal or to pay an extra fee to allow their research to be made widely available. The 'green route' is

to publish an article in a journal, and then archive a version of that article within their institution's repository.

As well as being an excellent means of sharing research with a wider audience, open access is increasingly becoming a requirement of academic life. It will form a significant part of the next Research Excellence Framework assessment, as only outputs published open access will be eligible for submission. The following papers are a small selection of research BU's academics have published open access over the last year.

## FACULTY OF HEALTH & SOCIAL SCIENCES

### Would a student run postnatal clinic make a valuable addition to midwifery education in the UK?

**T**here is growing evidence that changes to the NHS, particularly in the postnatal period, is having an impact on the quality and variety of student midwives' clinical experiences. It can make it more difficult for students to achieve the standards set by the regulatory body for midwives, thus making it more difficult to gain their license to practice. One way of resolving this, would be to introduce a Student Midwife integrated Learning Environment (SMiLE) focusing upon the delivery of postnatal care through a student run clinic. Academics at Bournemouth University undertook a review to find out more about the educational attainment of students who engage with student run clinics.

### Moving back: The radiation dose received from lumbar spine quantitative fluoroscopy compared to lumbar spine radiographs with suggestions for dose reduction.

**Q**uantitative fluoroscopy is an emerging technology for assessing continuous inter-vertebral motion in the lumbar spine, but information on radiation dose is not yet available. A study carried out by Bournemouth University and Anglo-European College of Chiropractic compared radiation doses from quantitative fluoroscopy of the lumbar spine with lumbar spine radiographs, and investigated factors related to higher radiation dose.

## FACULTY OF SCIENCE & TECHNOLOGY

### Geophysical Survey in Sub-Saharan Africa: magnetic and Electromagnetic Investigation of the UNESCO World Heritage Site of Songo Mnara, Tanzania

**A**rchaeologists at Bournemouth University carried out geophysical surveys at the UNESCO World Heritage Site of Songo Mnara, Tanzania. The town was a major Islamic trading port during the 14th and 15th centuries. The surveys revealed previously unidentified populations, and a deliberate demarcation of space within open areas of the town; areas which were subsequently excavated. The research demonstrated the benefits of a combined approach at these sites, and also led to an updated version of the town plan to include the newly discovered areas.

## FACULTY OF MANAGEMENT

### Developing dementia-friendly tourism destinations: an exploratory analysis

**D**ementia is emerging a global issue. Increases in life expectancy have created an older population with both age-associated health needs, but also higher lifestyle demands. Older people increasingly expect to be able to participate in leisure and tourism activities well into old age, but the challenges of health needs such as dementia can make this problematic. Researchers at Bournemouth University have highlighted the challenges and implications of the growing scale of dementia, and the potential opportunities for businesses in areas which hope to achieve dementia-friendly status.

### Yawning, fatigue and cortisol: expanding the Thompson Cortisol Hypothesis

**Y**awning and its links with neurological disorders has become a new scientific conundrum. Cortisol levels are known to rise during stress, and yawning may occur when under stress or tired. However, the links between cortisol and fatigue are not fully understood. Research from Bournemouth University has expanded the Thompson Cortisol Hypothesis, which suggests that the stress hormone cortisol is responsible for yawning, especially in people with incomplete innervation, such as Multiple Sclerosis. This helps to inform our understanding of the functional importance of the brain regulating stress and fatigue.

## FACULTY OF MEDIA & COMMUNICATION

### Elite Tweets: Analysing the Twitter Communication Patterns of Labour Party Peers in the House of Lord.

**D**espite starting as a personal social media platform, Twitter's potential to monitor public opinion and directly engage with constituents has not gone unnoticed by those with an interest in political communication. Researchers at Bournemouth University monitored Labour Party Peers' Twitter communications over a period of three months to establish their patterns of use and communication. Findings showed that as an online community, their behaviour is consistent with other communities. However, evidence suggests that there is a lack of coherent strategy; peers often seem to be working to promote the interests of small networks as opposed to Labour party policy.

# Bournemouth University's research recognised as world-leading

Bournemouth University's (BU) research has been recognised as world-leading in the 2014 Research Excellence Framework (REF). The REF assesses the quality and impact of research at all UK higher education institutions, across all disciplines and areas of research. The results are then used to help determine future levels of funding for universities and colleges.



BU submitted to eight subject areas and saw 96% of its research rated at an international level, with 18% of that deemed to be world-leading. Since the 2008 research assessment, research at Bournemouth has flourished, with our research that is rated as being world leading or internationally recognised increasing by 21%. The number of staff submitted for assessment has also increased by 45.5%.

Unlike previous assessments, the REF also measured the impact of research outside the world of academia. This could mean the difference that research has made to the economy, society, public policy, culture or even quality of life. 28% of BU's research was deemed to have an outstanding impact, and a further 67% was rated as having either a considerable or very considerable impact. Our excellent results reflect BU's commitment to research that makes a tangible difference to society, and are an acknowledgement of the hard work and dedication of all our staff.

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“BU's results reflect the world-class research which goes on at the university on a daily basis.”

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The assessment recognised BU as a leading university in both the UK and south west region. Tourism was rated as joint first in the UK, based on its internationally recognised research. Our tourism academics have, for example, worked with the Scottish Government to provide the evidence base for business decisions made at prestigious tourism organisations, such as VisitScotland. By developing a model to estimate the size and economic contribution of wildlife tourism to Scotland, research enabled VisitScotland to capitalise on the country's appeal as a wildlife destination and name 2013 as the year of 'Natural Scotland'.

Art and design was rated as first in the south west, based on its world-leading research. Research into improving motion blur techniques by academics at BU made a significant difference to the animation industry. Techniques had remained largely unchanged for over 20 years, until research from BU led to a better method of mimicking shutter opening and closing time, which allowed for more realistic images and an improved viewer experience. Within months of its publication, the research had been adopted by film studios across the world, including Pixar.

BU's results reflect the world-class research which goes on at the university on a daily basis. Looking to the future, BU intends to invest in and inspire research which builds upon its reputation of excellence, and continues to make a positive contribution to society.

## Successfully managing fatigue in people with multiple sclerosis

**F**atigue is one of the most commonly reported and debilitating symptoms of multiple sclerosis (MS) and can significantly reduce an individual's quality of life.

Unlike the tiredness that we all experience sometimes, fatigue in those with MS can have a hugely negative impact - it can limit or stop people from doing day-to-day activities and things that really matter to them. It is the main reason why people with MS stop working. Research undertaken at Bournemouth University (BU) has been tackling the challenge of managing fatigue in people with MS, with encouraging results.



Professor Peter Thomas and Dr Sarah Thomas

Dr Sarah Thomas, Professor Peter Thomas and colleagues from the BU Clinical Research Unit, along with collaborators from the Dorset MS Service at Poole Hospital, have developed a group-based fatigue management programme for people with MS called FACETS (Fatigue: Applying Cognitive behavioural and Energy effectiveness Techniques to lifeStyle). This programme combines providing people with tools and strategies to manage their energy levels more effectively and supporting them to explore different, more helpful ways of thinking about fatigue.

The programme is delivered via a series of weekly group sessions, facilitated by two health professionals who have experience of cognitive behavioural approaches and of working with people with MS. The sessions are highly structured and incorporate a combination of learning techniques, including presentations, group discussions, flipchart exercises and tasks to do at home.

FACETS has been evaluated in an MS-Society funded trial led by Professor Thomas with collaborators from Poole, Bristol, and Southampton. Participants were randomised into two groups; one of which attended the

FACETS programme in addition to usual care, and one of which continued with their routine care. The results showed that the FACETS group demonstrated improvements in fatigue severity and self-efficacy at a four-month follow-up. A year on from the beginning of the trial, improvements were still sustained and additional improvements in quality of life were even emerging.

Given the progressive nature of MS, the debilitating nature of fatigue, and the lack of effective fatigue drug treatments that work for the majority, such findings are encouraging and important. People who attended the

FACETS programme gave feedback after each session and these ratings indicated high overall satisfaction: "It was very helpful to me. I learned a lot and it has made my life so much easier. I would recommend it to anyone."

"A year on from the beginning of the trial, improvements were still sustained and additional improvements in quality of life were even emerging."

For the research team, one of the most rewarding aspects of carrying out their work has been seeing it rolled out in to practice and improving the quality of life for people with MS. The UK MS Society has developed the research into one-day training courses for health professionals, who are then able to apply their new knowledge to support people with MS in their local areas. Alison Nock and Vicky Slingsby, both occupational therapists, have been delivering the training. To date, over 150 health professionals have been trained across the UK, and the course has been very positively received. One attendee commented: "The course was fantastic - best training I have had in a very long time."

Not only has the research been of benefit to people with MS, it has also inspired a number of other research projects across Europe. A French research team based at the Université Paris Ouest Nanterre La Défense are looking to develop booster sessions for the FACETS programme, which will be particularly useful given the unpredictable and progressive nature of MS. Other researchers in Norway and Germany are also undertaking work to adapt the FACETS programme for different clinical settings and healthcare systems.

Thomas S, Thomas PW, Kersten P et al (2013), 'A pragmatic parallel arm multi-centre randomised controlled trial to assess the effectiveness and cost-effectiveness of a group-based fatigue management programme (FACETS) for people with multiple sclerosis', *J Neurol Neurosurg Psychiatry*, 00(1-8)

Thomas PW, Thomas S, Kersten P, Jones R, Slingsby V, Nock A, Davies Smith A, Baker R, Galvin KT, Hillier C. One year follow-up of a pragmatic multi-centre randomised controlled trial of a group-based fatigue management programme (FACETS) for people with multiple sclerosis. *BMC Neurol* 2014; 14:109

# Improving nutrition in cancer survivors

**S**tories involving cancer and its devastating consequences are a frequent occurrence in the news. We are constantly being told which foods may cause cancer, and which may prevent it, but how much is fact, and how much is fiction is often in dispute. The same is true for cancer survivors trying to find reliable nutritional information which will help them to improve their quality of life and prevent future relapses.

A team of researchers at Bournemouth University (BU), led by Dr Jane Murphy, are working with cancer nurse specialists to change that. By developing an e-learning tool for healthcare professionals, the team has created an innovative way of educating and empowering frontline staff to deliver reliable and helpful information about nutrition. The tool provides staff with accurate and evidence-based nutritional information for cancer survivors. By teaming up with UK charity Macmillan Cancer Support, the online tool was made available through Macmillan's Learn Zone webpages, which increased the number of people who could access it.

For busy frontline staff, the online learning tool has proved hugely beneficial, as they are able to use the resource as and when they need to. Much of Dr Murphy's research focused on making the tool as user-friendly as possible, in order to avoid it becoming an onerous or time-consuming learning experience. The content needed to be evidence-based, but delivered in an accessible way, through bite-sized chunks and interactive sessions. It also needed to be pitched at a level appropriate for professionals, without either dumbing down or becoming overly technical. As Dr Murphy explains: "The tool was not specifically designed for people who have had a cancer diagnosis, although cancer survivors themselves can still use it and benefit from it; it was made with healthcare professionals in mind."

The tool was evaluated through focus groups, made up of practice nurses, cancer nurse specialists, nutritionists, GPs and recovered

cancer patients. Thematic analysis of the results plus anecdotal evidence showed that before using the e-learning resource few healthcare professionals had received any training about nutrition for cancer survivors. Responses showed that being able to use Dr Murphy's tool left healthcare professionals feeling more empowered and confident about having an informed discussion with their patients. Staff also cited their confidence in the accuracy of the information in the online tool; feedback no doubt helped by the added credibility through support from Macmillan.

**"For busy frontline staff, the online learning tool has proved hugely beneficial, as they are able to use the resource as and when they need to."**

The use of evidence-based information was hugely important in the development of the tool. As Dr Murphy explained: "There is a lot of misinformation out there around food and nutrition. For cancer survivors, it is fair to say that there is a lot of information available, but is it correct? Can it improve health and wellbeing and give the best chance of survival?"

"For instance, it is very easy to find the wrong sorts of information through the internet. This was another reason to develop an online tool, working in partnership with Macmillan that uses really robust and accurate evidence."

The research and evaluation of the e-learning tool was published in *Nurse Education Today* which is widely-read by nurses, nurse practitioners and other allied health care professionals. Dr Murphy explains that the decision to publish open access was driven by a desire to see their research and online tool have the biggest possible impact on the lives of cancer survivors. The resource remains live and accessible on the Macmillan Cancer Support website and is being used and updated regularly. The work has also played a key role in informing a new initiative by Macmillan to improve the lives of cancer survivors through healthier lifestyles.

Dr Murphy and the team at BU are now researching the complex nutritional needs of people with dementia. Working with local organisations and care homes, their research (funded by The Burdett Trust for Nursing) will develop a better understanding of the delivery of nutrition to enhance dignity in dementia care. By creating a toolkit and suite of educational tools for healthcare professionals and carers, they aim to improve the lives of those with dementia.

Murphy, J., Pulman, A., Jeffery, J., Worswick, L. and Ford, G., 2015. Translating research into practice: Evaluation of an e-learning resource for health care professionals to provide nutrition advice and support for cancer survivors. *Nurse Education Today*, 35 (1), 271-276

# The need for online revolution in the tourism industry

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The internet, and smart technology, have revolutionised the way consumers shop and interact with service providers. From online shopping to keeping up with the latest news, a range of industries have had to adapt to reflect the online habits of their customers. But the travel and tourism industry seems to have thrived online more than most, and Bournemouth University's (BU) Dr Alessandro Inversini has been researching how the travel and tourism industry can improve its online offering to benefit consumers.

"My research sits in the space where tourism and new media overlap," says Dr Inversini, "From design to evaluation of tourism websites, from online communication to branding and reputation, from eCommerce to eLearning; I have been looking at and evaluating tourism destinations' websites and the relevance of social media in hospitality."

The internet has been commonplace in business for well over a decade, but some tourism outlets still struggle to communicate their brand to consumers. Dr Inversini explains: "Travel and tourism is a very peculiar field when it comes to online communication and online media. Technology has dramatically changed the competition landscape, and everyone in the tourism industry is now trying to take advantage of this global marketplace.

"Often, and this comes from my experience in the industry, destination managers are more concerned about maintaining political and social balance within the destination rather than creating real and useful websites for the actual tourists. In other words, the

websites we see are often generated by the compromises between destinations and stakeholders. These outlets need to change and focus on the actual user, the consumer. Only by doing that, only by understanding the information needs and the experience 'touch points' can destination websites can improve their effectiveness."

Two studies in particular, led by Dr Inversini, have shed light on the need for tourism outlets to adapt to what their customers want, and not what their competitors are doing. "With the first study we tackled the issue of information overload and website design. We analysed 120 websites of English destinations. We argued that tourism destination websites should be designed keeping in mind the end user, rather than reflecting the complexity of the tourism ecosystem, which is often the case.

"With the second study, we have been looking at the relevance of social media and conversation marketing to influence the booking behaviour of tourists. Basically, in order to foster hotel bookings, hospitality

managers should engage with tourists on social media to actually drive conversion."

**"The internet has been commonplace in business for well over a decade, but some tourism outlets still struggle to communicate their brand to consumers."**

This practical research is already having implications for a number of tourism providers, giving advice on how they should tailor their online profile and interact with tourists to encourage more business. Dr Inversini continues, "In the second study about social media and hospitality, we focused on the real conversations happening in the online arena, specifically the connection between review websites and actual booking sites, or in other words the connection between websites such as Tripadvisor and Expedia. Our study showed that a closer relationship between

these websites, combined with an active role of the destination managers on these sites will enhance travellers' bookings."

So what should tourism and hospitality destinations be doing online to attract further custom? Dr Inversini's research has a clear outcome: "Engage! Engage! Engage! Social media is the preferred communication tool of modern travellers. Smartphones mean that travellers are always connected and in need of information. Consumers expect immediacy so that is what the industry needs to give them."

There are plans to extend the research to provide more advice to the tourism industry on their online services. "Compared to other media, for example print media or broadcast media, the internet is in its infancy. Technologies are now pervasive and tourists are actually relying on these as communication means so it is important that they are researched thoroughly, which we are doing at the eTourism Lab at Bournemouth University."

The research was published open access, something Dr Inversini believes to be a strength: "I am a big fan of open access. And I really believe in whatever is 'open'. I believe that academia should embrace high quality open access. Two current projects I am managing at the Faculty of Management at BU are actually producing online education material under creative commons licensing and I am pleased about that, as anyone can actually benefit from these – it's the future of education."

Inversini, A. and Masiero, L., 2014. Selling Rooms Online: The Use of Social Media and Online Travel Agents. *International Journal of Contemporary Hospitality Management*, 26 (2), 272 – 292

Inversini, A., Cantoni, L. and De Pietro, M., 2014. Destination Online Communication: Why Less is Sometimes More. A Study of Online Communications of English Destinations. *Journal of Travel and Tourism Marketing*, 31 (5), 563 - 575

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# Standing up for banking for the public good

The UK banking system has had a lot of press recently, mostly for negative reasons as bankers' bonuses, foreign exchange rate fixing and a rise in interest rates have grabbed the headlines. The British public are being warned of tough times continuing as the country recovers from recession and pays back its national debt.

But will the UK's financial system ever change? Are big banks really serving the UK public well or is self-interest the real aim of the UK's high street banks. Bournemouth University's (BU) Professor Andy Mullineux has been looking at the problems with UK banks and what needs to happen to drive change in our financial system that is better for British consumers. Professor Mullineux argues, "Bank shareholders cannot be expected to provide good stewardship to banks because there is a conflict of interests between the bank owners and the bank's depositors."

A key turning point identified by Professor Mullineux is the state of the UK banking system following the 'global financial crisis' of 2008. He continues: "Once banks become 'too big (to be allowed) to fail' (TBTF), they enjoy public (taxpayer) insurance, or a government bailout that enables them to fund themselves more cheaply than smaller banks, which gives them a competitive advantage.

"The TBTF problem has been worsened by mergers to save failing banks during the crisis and as a result competition within a number of national banking systems, notably the UK, has been significantly reduced."

So with UK banks enjoying a period of government-funded respite and a shrinking pool of competitors, what does the future have in store for the UK's banking industry? Ultimately, the consumer needs to be protected; nothing will change without intervention but greater protection is needed for the man on the street – not just to safeguard their savings but also to protect how their taxes are used to prevent TBTF banks from further decline.

Professor Mullineux's research outlines: "Retail banking is essentially a utility and should be regulated as such. This regulation is required to protect depositors where deposit insurance schemes are, at best, partially funded and underwritten by taxpayers, who in turn need to be protected, and to deliver financial stability, a public good."

**"Ultimately, the consumer needs to be protected; nothing will change without intervention but greater protection is needed for the man on the street – not just to safeguard their savings but also to protect how their taxes are used to prevent TBTF banks from further decline."**

But it is not just public protection that would drive change in the banking sector. "To fully escape the moral hazard associated with TBTF banks we need to break up the big banks and eliminate conflicts of interest".

"My hope is that the new Competition and Markets Authority's recently announced investigation will propose a substantial restructuring of the banking system and the government will act on it, though I doubt this will happen".

"Countries with less concentrated and more diverse banking systems, such as Germany and the US, are better served by their banks – and this is what we should be striving for." The future is not as bleak as some may think either, with a rise in technology (through the internet) providing light at the end of a very long tunnel that has previously been synonymous with shareholder-owned multi-national super-banks.

Professor Mullineux concludes: "Some progress is being made in enhancing the role of credit unions and Community Development Finance Institutions (CDFIs) in UK banking and the county of Hampshire is even in the process of establishing a community bank. Internet providers and the new 'Challenger Banks' may help add competition, but we need the diversity provided by new mutual banks to fill the role previously played by mutual building societies and help to bring true competition back to our high streets."

The research was published through open access, and Professor Mullineux believes this is a good thing. "Journals' control of content and the charges for open access publication needs to be curbed. The review process is useful, but refereeing can bias publication towards accepted paradigms, stifling innovative non-mainstream publication. Open access allows for a freer, non-censored publishing model that allows for greater openness in research."

Research in this area has continued and Professor Mullineux is now looking at tax and regulation of banks and a reform of bank taxation to provide a fairer and more robust banking sector that will bring a fairer market, with better protected consumers, back to the UK.

Mullineux, A., 2014. Banking for the public good. *International Review of Financial Analysis*, 36: 87 - 94

# Seen but Seldom Heard: challenging the perceptions of young disabled people through poetry and performance

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The London 2012 Paralympics raised the profile of disabled athletes in way never seen before. The focus was unquestionably on people's achievements and successes rather than exclusively on their disabilities. While it went a long way towards changing perceptions of disability, concerns remained that it did little to challenge the negative media portrayals of disabled people. Some even argued that the image of disabled athletes as 'super humans' only served to emphasise the divide between elite sports people and ordinary disabled people.

For Dr Carrie Hodges and her team in Bournemouth University's (BU) Faculty of Media & Communication, and Wendy Cutts and Dr Lee-Ann Fenge from the Faculty of Health & Social Sciences, the platform provided by the Paralympics created the

perfect opportunity to challenge perceptions of disability. 'Seen but Seldom Heard' is a collaborative project between BU and the Victoria Education Centre and Sports College, Poole. By working with young disabled people, the research explored their experiences of disability through creative methods.

**"The resulting poems were diverse and imaginative, shining a light on how people thought others saw them and how it made them feel."**

One of the challenges of working with young people was designing a project which allowed participants to work in collaboration with researchers rather than being seen as subjects. By using creative, poetry-based approaches, the 'Seen but Seldom Heard' project aimed to enable young people to tell their own stories and develop confidence in their own skills. As well as being more engaging for those involved, it was felt that supporting people to tell their own stories, in their own words would be an extremely powerful way of reaching the hearts and minds of the audience.

Poems were written in workshops facilitated by performance-poets – Jonny Fluffypunk and Liv Torc - school support staff, Dr Hodges

and Wendy Cutts. By focusing on a variety of issues – such as the Paralympics and everyday life with a disability – the young people learned how to communicate and express themselves through poetry. The resulting poems were diverse and imaginative, shining a light on how people thought others saw them and how it made them feel. Through a mixture of film and live performance, the young people were supported to put on a series of poetry events to showcase their work, including performances at the House of Commons in 2014 and as part of the 2012 cultural Olympiad.

The effect on both participants and audience members was profound. One student said: "I wanted to express my story and show people that disability isn't all about the wheelchair. Some people found the poetry humorous, some people found it emotional. [The most important thing about the project was] that we all got our individual voices heard... everyone deserves a say." Reactions from audience members were just as emotive. One commented: "[It] was very powerful – challenged my preconceptions. Broken down barriers – mainly based on fear. Very effective – the poems I have heard today were very evocative and moving."

Given the participatory approach underpinning the research, it was important for its results to be freely available. "The



Performance at the House of Common in December 2014

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intention behind publishing open access was to be able to share best practice and the methodology behind our work so that community groups would be able to draw upon it and develop it into their own projects," explains Dr Hodges, "It also means that we can share it with young people who want to be part of future workshops. By making our research widely available, we have been able to leave an academic legacy which will benefit others."

The initial scope of the project was to work with a local residential and day school which offers specialist care and education to children and young people with physical disabilities and complex medical conditions. Throughout the course of the project, the team has seen

the young people they worked with grow up, and in some cases go on to studies or careers in creative subjects which they might not otherwise have considered. The difference it has made to the lives of those who took part has been part of the inspiration behind seeking further funding to extend the work.

Additional funding will support a collaborative project working with BU students and young disabled adults (18-25) going through the transition from school to adult life. This can be an exciting time for a young person but when a young person also experiences disability, it can also be challenging. As Dr Hodges says: "The transition into adulthood and future aspirations is a theme which unites BU students and young disabled adults and this

project provides the space and opportunity to explore what this means for both groups. This can be a time of significant change and potential disruption for young people, which makes it an important issue to explore." By enabling people to express their own experiences of transitioning to adult life, it is hoped that others will learn from them and be inspired to share their own stories.

Hodges, C, Fenge, L and Cutts, W 2014. Challenging perceptions of disability through performance poetry methods: the 'seen but seldom heard' project', *Disability and Society*, 29(7), 1090-1103.

# The Occupy movement: a history of protests

Despite recent media attention on worldwide uprisings and protests, such as the Arab uprisings and the Occupy movement, the phenomenon of protest camps is not new. Throughout human history and across multiple locations, when faced with significant societal challenges, people often gather to protest against the problems they face. Dr Anna Feigenbaum, leader of the politics programme at Bournemouth University (BU), has been examining the phenomenon of protest camps, looking at what makes them unique, what draws people to them and what it says about human behaviour and social change.

"Protest camps are a unique phenomenon among types of demonstration. They often have no specific end point and evolve in response to a particular social or economic problem," explains Dr Feigenbaum. "However, despite the sudden rise in protest camps across the world over the last few years, they are not a new form of demonstration. Our research has shown that protest camps have occurred all over the world and at multiple points in human history."



Dr Feigenbaum's interest in protest camps stemmed from a PhD dissertation exploring creative resistance and technology used during the Greenham Common protest camp in the 1980s. Through chance meetings with Dr Fabian Frenzel who was studying European protest camps and Dr Patrick McCurdy who was working on the 2005 G8 protests at Gleneagles, a new research collaboration emerged. This led to the publication of 'Protest Camps' - a book exploring the media, governance and social practices of over 50 protest camps over the span of 50 years.

With the advent of the Occupy movement and Arab uprisings, their research gained huge amounts of interest as people tried to make sense of events occurring across the globe. As Dr Feigenbaum says, "Suddenly the Occupy movement and protest camps became

household terms and everybody wanted to know more about them. The research carried out by our collaboration added a unique voice as we were able to put current events into historical and political context."

Looking to the future, Dr Feigenbaum's work has already led to new avenues of research, as her interests have now turned to exploring the rise in the riot control market (funded by the Wellcome Trust). "Instead of responding to the underlying reason behind protests, governments often rely on riot control to deal with what they perceive to be the problem. It casts the police in the role of the 'enemy', but just as protest camps are not a new phenomenon neither are the means of disrupting them," says Dr Feigenbaum.

"Since the 1930s, tear gas has been used as a means of dispersing protest camps. In early

advertisements, it was even marketed as a way to 'break the spirit'. It is almost an antithesis to the idea of protest camps, which are so often seen as creative spaces - spaces designed to spark new ideas and ways of thinking."

For Dr Feigenbaum, publishing work open access is an important part of academic life, explaining: "For me, my passion for social change and education is inseparable from critical thinking and public engagement. By making research freely available, new ideas can be generated, and just as with the phenomenon of protest camps, you can never know what changes it may spark."

Frenzel, F., Feigenbaum, A. and McCurdy, P. (2014), Protest camps: an emerging field of social movement research. *The Sociological Review*, 62: 457-474

# Blogging on the ice: connecting audiences with climate-change scientists

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Climate change is a perennially controversial subject frequently splashed across mainstream headlines. However, what we see in the news is not always what the scientists at the front line of climate change experience. Some scientists have been trying to counteract these misconceptions via citizen journalism and directly connecting with the public through blogging rather than official media channels.

Bournemouth University's (BU) Dr Einar Thorsen has spent several years researching citizen journalism around the globe with a particular interest in the polar regions. Growing up in Norway he had admiration for Norwegian national heroes - the polar explorers Nansen and Amundsen - but it was as an adult while co-editing "Citizen Journalism: Global Perspectives" that Dr Thorsen got to combine his personal and professional interests.

He set about some polar exploring of his own, looking at the idea of citizen journalism as an education tool and the extent to which scientists achieve an unmediated form of communication through their blogging. The International Polar Year (2007-2008) was

an obvious starting point for the research with a huge increase in the number of blogs originating from and written "on the ice". Focusing on the uses and decision-making behind blogging, Dr Thorsen analysed over 50 Antarctic blogs published throughout the period and interviewed several of the bloggers involved.

Much of the media reporting on climate change and polar issues is through the lens of staged pseudo-events or celebrity campaigners such as Al Gore. The Antarctic blogs, whether official or personal, raise awareness of climate change issues and communicate directly with the public on current polar projects and life on the ice. Scientists writing them are acutely aware of their role as ambassadors for polar sciences and many blogs are used as educational tools, connecting scientists with classrooms and establishing a means of direct dialogue with students. They also shed light onto scientific processes, as Dr Thorsen explains, "Popularising the process of scientific enquiry is an incredibly powerful tool to help engage people and explain what can often be complicated scientific findings."

The research concluded that as a form of citizen journalism, science blogging is here to stay. Dr Thorsen believes it is unlikely to overtake traditional media channels but instead will complement established environmental and science reporting. He said, "Journalists can use scientists' blogs to connect with a broader range of sources and link out to their blogs to provide audiences with better context for their work." Dr Thorsen's work, "Blogging on the ice: connecting audiences with climate-change sciences" was published as an article in the International Journal of Media and Cultural

Politics, and his findings also appeared as a chapter in the book, "Citizen Journalism: Global Perspectives", co-edited with Professor Stuart Allan. Making his research findings open access was important to Dr Thorsen, as his research "is concerned with examining how journalism, in different ways, engenders societal change or holds power to account, it is crucial that it has as wide a reach as possible.

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"Scientists writing them are acutely aware of their role as ambassadors for polar sciences and many blogs are used as educational tools, connecting scientists with classrooms and establishing a means of direct dialogue with students."

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"I want to encourage both scholarly and public engagement with my findings, and have a tangible impact upon my area of research, so publishing open access is crucial to this endeavour."

Further research on citizen journalism is underway with indigenous peoples in the Arctic region and finding out how their blogging could drive change on major environmental and cultural issues.

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Thorsen, E., 2013. Blogging on the ice: Connecting audiences with climate-change sciences. *International Journal of Media and Cultural Politics*, 9 (1), 87 - 101

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Dr Dinusha Mendis with BU's printing machines

## 3D printing: a technology that could revolutionise our lives

3D printing, or additive manufacturing, is the process of turning a 2D digital image into a 3D object through printing successive layers of materials until an entire item is created.

Initial images are created in design software programmes before being realised through 3D printing. The advent of consumer 3D printing has the potential to revolutionise its use as a technology, but also opens up a whole host of intellectual property (IP) debates.

Dr Dinusha Mendis' research into the intellectual property issues around 3D printing stemmed from a personal interest in the latest technological advances. As Dr Mendis says: "While 3D printing was first developed more than 30 years ago, its expansion into consumer printing is revolutionary. Moving into the consumer market means it is developing rapidly as a technology, which opens up all sorts of questions around intellectual property rights and copyright."

The IP laws in the UK were created long before 3D printing, or any of its associated technologies came about, which means that legislation often lags behind the issues being faced by UK consumers and businesses. It leads to a number of grey areas, many of which Dr Mendis has tackled in her recent research for the UK Intellectual Property Office, in collaboration with Econolyst, the leading 3D printing and additive manufacturing company in the UK.

As a technology, 3D printing has the potential to impact on a vast number of markets, ranging from toys and games for consumers, to personalised health equipment such as hearing aids, through to highly specialised parts to be used in aircraft. Its variety of uses also means that the potential impact on existing intellectual property laws is difficult to predict.

For example, what would be the copyright implications be if an individual modified an existing design file or scanned an existing object to create a new design file? Can computer-aided design (CAD) files be protected under copyright law? What are the implications of modifying someone else's CAD file? For businesses, copyright issues could arise when replacement parts are produced, perhaps through a third-party supplier.

"Our research showed that for consumers, the key issue is providing better guidance about the copyright status of CAD files," explains Dr Mendis. "While online platforms for sharing 3D printing design files are still quite niche, interest in them and activity is increasing year-on-year. For businesses, the implications are unlikely to be felt immediately because the cost of printing replica parts is still relatively high. However, as the technology grows and becomes more widely used – particularly in the automotive industry – its effects need to be monitored and measured."

"While 3D printing was first developed more than 30 years ago, its expansion into consumer printing is revolutionary."

As 3D printing becomes more popular and more accessible to the average consumer, the key issue for businesses will be ensuring that their products are readily available through legal channels. While it will be some time before 3D printing becomes as widely available, precedents from music and film sharing platforms suggest that the more accessible content is made for consumers, the less likely they are to resort to illegal downloads. By being conscious of these trends and building business models which take into account past precedents, the development of 3D printing as a consumer technology could avoid potential difficulties in the area of intellectual property rights law.

*Based on the research carried out for the UK IPO Commissioned Project on the intellectual property implications of 3D printing led by Dr Dinusha Mendis. The three-part study was authored by Dr Dinusha Mendis and Dr Davide Secchi of Bournemouth University and Dr Phil Reeves of Econolyst. The findings are expected to be published in early 2015.*

## Auditory processing: are expectations more important than sound?

<http://research.bournemouth.ac.uk>

What affects how we hear? Do we hear sounds as they are, or do our expectations about what we are going to hear instantaneously shape the way sound is processed? These are questions that Bournemouth University's (BU) Dr Emili Balaguer-Ballester and colleague Andre Rupp of Heidelberg University have been considering in their research into auditory central processing.

Through the use of computational neuroscience models, Dr Balaguer-Ballester and his team intend to map the way that the brain processes sound. "Almost 80% of connections between central and pre-cortical areas during sound processing seem to be top-down i.e. from the brain to the auditory peripheral system and not bottom-up, which is perhaps unexpected," he explains. "As sound comes from an external stimulus, it would be fair to assume that most of our processing occurs from what we hear, but that is apparently not the case. What your brain expects to hear can be as important as the sound itself."

This is backed up by the fact that it takes hundreds of milliseconds for sound to be processed along the neurons from the ear to the brain, which does not explain how we can immediately recognize the sex of a speaker or identifying a melody after just a few milliseconds.

Until recently, monitoring neural activity at different levels of the auditory system in such detail simply was not possible. However, thanks to technological advances, Andre Rupp and his team are able to combine magneto- and electroencephalography to map brain activity through recording electromagnetic currents which occur naturally in the brain and brainstem simultaneously. This allows for very detailed temporal information about how the brain processes sound to be recorded. Dr Balaguer-Ballester, a physicist by background, is then able to use the data from Heidelberg to develop models to show in detail how the brain processes sound.

The potential impact of their work is significant. For instance, by understanding how sound is processed, new treatments for auditory processing disorders can potentially

be found in the future. As Dr Balaguer-Ballester says: "This could be the first step towards a better understanding of auditory central processing disorders in children. If their learning difficulties stem from the way their brain processes sound and not in their peripheral auditory system, this requires very different treatment to a child who develops serious hearing loss after an illness. Central processing disorders can lead to problems such as the delay of language development in children, so it is important to be able to pinpoint the neural parameter which is altered, in order to appropriately treat the cause of such an alteration."

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"By understanding how sound is processed, new treatments for auditory processing disorders can potentially be found in the future."

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For Dr Balaguer-Ballester, publishing this research open access was important as it meant that it was accessible much quicker than through more traditional journals. "For postgraduate students and PhD students, this is really important," he explains, "as they are able to see their articles published without delay which helps their careers. It also meant that research is freely available to use by a much wider audience."

Balaguer-Ballester E, Clark NR, Coath M, Krumbholz K, Denham SL (2009) Understanding Pitch Perception as a Hierarchical Process with Top-Down Modulation. *PLoS Comput Biol* 5(3): e1000301

# What rabbits can tell us about Neanderthal extinction



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**W**hen thinking about the extinction of Neanderthals some 30,000 years ago, rabbits may not be the first thing that spring to mind. But the way rabbits were hunted and eaten by Neanderthals and modern humans – or not, as the case may be – may offer vital clues as to why one species died out while the other flourished.

Dr John Stewart, Associate Professor in Paleocology and Environmental Change at Bournemouth University (BU), is part of

a team which analysed data on rabbit bone remains, found in archaeological excavations of caves in the Iberian Peninsula. They found that while rabbits were a crucial part of the modern humans' diet, they were relatively under-utilised by Neanderthals.

"Rabbits originated in Iberia and they are a very special kind of resource, in that they can be found in large numbers, they are relatively easy to catch and they are predictable," said Dr Stewart. "This means that they are quite a good food source to target. The fact that the Neanderthals did not appear to do so suggests that this was a resource they did not have access to in the same way as modern humans."

The fact that Neanderthals – typically associated with hunting large prey over short distances in woodland settings – were seemingly unable to catch and kill such creatures is compounded by rapid changes

in the environment. "The climate was changing and the ecology was decreasing in terms of the amount of animals they were able to hunt," Dr Stewart explained. "If Neanderthals were more tied to these large mammals, the loss of them could have driven them to extinction."

Evidence that modern humans were more able to hunt across large, open spaces - and used technological innovations such as twine and traps to help them catch faster, smaller prey, including rabbits - suggests that they adapted better to this change in surroundings. Dr Stewart said: "Modern humans had more that they could do – they had more possibilities and were more able to cope with the deterioration of climate than Neanderthals were. If modern humans thrived when Neanderthals did not, it must mean that modern humans were better at exploiting resources than Neanderthals."

This ability to adapt to shifting temperatures is particularly pertinent, with climate change currently threatening to impact upon human life once more. "It does relate to our own situation currently, with humans now in this potentially perilous situation with climate change," said Dr Stewart. "From a long-term ecological perspective, all species go extinct – that is an inevitability. But if we do not want it to happen sooner rather than later, we have to understand this phenomenon."

Dr Stewart's current work looks at how population changes in other species – such as birds and lemmings - at the time may mirror and have impacted upon what happened to the Neanderthals. He has also begun a multidisciplinary project with BU Associate Professor in Psychology Dr Jan Wiener and Senior Lecturer in Creative Technology Dr

Christos Gatzidis. This will use computer game and eye-tracking technology to explore detection of prey in different environments and uncover more about how these abilities first evolved.

**"From a long-term ecological perspective, all species go extinct – that is an inevitability. But if we do not want it to happen sooner rather than later, we have to understand this phenomenon."**

The extinction of the Neanderthals, our closest known relative, is a subject that continues to attract fascination and debate, and so it is

important to Dr Stewart that his work can be accessed by people who want to find out more. Publishing open access is one way in which he hopes to achieve this. "It is a no-brainer, really," he said. "I do not think that any of us do research and want no-one to read it."

"Neanderthal extinction is one of the big anthropological issues – it's the loss of the best known close relative that we've got, and I think most people have a passing interest. Our understanding of these species is amazing and it's only getting better as we are realising how important it is to ourselves."

Fa, J.E., Vargas, J.M., Stewart, J.R. and Lloveras, L., 2013. Rabbits and hominin survival in Iberia. *Journal of Human Evolution*, 64 (4), 233-241

# The genetics of psychiatric disorders

While it has long been recognised that genetics – alongside environmental factors – play a role in developing psychiatric disorders, the function of individual genes is still largely unknown. But an international, multi-disciplinary team led by Bournemouth University's Dr Kevin McGhee is aiming to uncover just that – using fruit flies to isolate and examine the genes involved in the development of schizophrenia, with the hope of improving knowledge and treatments for the condition.



Dr Kevin McGhee in the laboratory

"In psychiatric genetics, a lot of time and money has been invested in large, genome-wide studies to find the genes that are involved," said Dr McGhee, a Senior Lecturer in Health Sciences at Bournemouth University (BU). "Now, we want to find out what the functions of those genes are. If you can do that, the ultimate impact is that you can then design better treatments." Dr McGhee is the principal investigator of the year-long project, working alongside colleagues from the National University of Ireland, Galway and University of British Columbia, Vancouver.

Students are also playing a part in the Bournemouth University funded project, with a number of dissertation students

trained to carry out lab-based examinations of the fruit flies. They will isolate and switch off genes that human data has previously indicated play a role in schizophrenia, before examining the effect on the flies' nerve cells at different life stages.

"If we can prove that it works and can be applied to human psychiatric genetics, then it helps create a cheap and easy functional model that is beneficial to everyone," explained Dr McGhee. "I believe what we find out from these genetic studies will help infer what is going on biologically, and that will ultimately lead to better treatment."

Another strand of the research will help kick-start the use of psychiatric genetic counselling in the UK. Genetic counselling – where patients and relatives are given advice and support around the probability of developing an inherited disorder – has long been used to assess the risks around conditions like Down's Syndrome and certain cancers.

A psychiatric genetic counselling workshop – the first of its kind - is being held by the research team. It will explore how best to translate the increasing knowledge about the genetics of psychiatric disorders into educational and counselling-based interventions to improve outcomes for patients and their families.

"Genetic counselling will probably expand over the next ten or 20 years and we want to put BU at the forefront, as a UK leader in the field," said Dr McGhee, adding that the workshop has already attracted interest from around the world. "I think people having that education and training to be able to explain and support people through diagnosis will lead to better treatments and help reduce that sense of stigma and guilt around psychiatric disorders."

Open access publishing is another way in which Dr McGhee believes that the wider public can benefit and learn from research projects. "Impact is really important for research and open access really helps to

achieve that - as anyone can see it, whether they are students, doctors, charities, policy makers, whoever," he said.

**"Genetic counselling will probably expand over the next ten or 20 years and we want to put BU at the forefront, as a UK leader in the field,"**

"I think, hopefully, another impact of this work will be to better show where we are with this research, which again goes back to open access – helping people to see that there are

hundreds of markers and hundreds of genes and they each have a very small effect. "Ultimately, we want to educate the healthcare professionals, policy makers and eventually the public – the patients and families who suffer from psychiatric diseases – so that they are better informed."

Derks EM, Vorstman JA, Ripke S, Kahn RS; Schizophrenia Psychiatric Genomic Consortium, Ophoff RA., 2012. Investigation of the genetic association between quantitative measures of psychosis and schizophrenia: a polygenic risk score analysis. PLoS One



**Bournemouth University**  
 Fern Barrow, Poole, Dorset BH12 5BB

**Research and Knowledge Exchange Office:**  
**Telephone:** +44 (0)1202 961200  
**Email:** [research@bournemouth.ac.uk](mailto:research@bournemouth.ac.uk)  
**Web:** <http://research.bournemouth.ac.uk>

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