



How breathing slowly can help lower blood pressure and reduce the risk of serious health conditions

Slowing down your breathing is well known to help with relaxation, but recent research suggests it might also help to treat high blood pressure. Researchers at Bournemouth University have created a therapeutic breathing exercise app called Brythm, which guides people to breathe more slowly and deeply, using a personalised protocol.

The research is being led by Professor Alison McConnell, a physiologist who has previously undertaken research showing the positive effects of breathing muscle strength training on exercise tolerance for athletes as well as people with cardiovascular or respiratory disease.

“Our new anti-hypertension app has been developed to provide people with a personalised training programme that adapts their breathing rate according to their individual physiology,” explains Professor McConnell, “It’s designed to be used for just ten minutes per day using a smart phone or tablet, which fits easily into most people’s busy lives.

“The app monitors your heart rate and other features via a small finger cuff that’s connected to your phone or tablet. This monitors your cardiovascular responses, guiding

breathing to a rate of around six breaths per minute, which is about half the normal rate.”

Professor McConnell is carrying out research to find out more about the effects of the Brythm app for different groups of people who have high blood pressure. She has recently secured funding for a PhD student to work with pregnant women who have pregnancy induced hypertension.

“This will be a really interesting group to work with, as irregular breathing might be one of the factors that leads to development of pregnancy induced hypertension,” says Professor McConnell, “Pregnant women are also unlikely to have other serious health conditions or be undergoing other treatments that might affect their responsiveness to Brythm, which will

make it easier to test whether there is a link between slower breathing and hypertension.”

“We’ve partnered with the National Childbirth Trust, which is helping us to develop Brythm and to make contact with pregnant women who can help with the research. We hope that our preliminary results will eventually lead to full clinical trials.”

Professor McConnell’s ultimate aim is to be able to demonstrate the effectiveness of the Brythm app for different groups of people and see it rolled out across the NHS as a simple and cost-effective way of improving health and preventing more serious medical conditions, such as strokes, which are linked to high blood pressure.

“High blood pressure can lead to a number of very serious medical conditions,” explains Professor McConnell. “If we can show that short daily sessions of slower breathing have a beneficial effect on blood pressure, then hopefully we can make a huge difference to people’s lives and reduce long-term costs to the NHS.”

To find out more and try out the Brythm app for yourself, drop into the Festival of Learning at Poole Quay on Sunday 9 July.



Our annual Festival of Learning is now in its fifth year and helps bringing learning and our research to life through free events and activities. This special edition of the Bournemouth Research Chronicle shares a small snapshot of the fascinating research featured as part of the Festival of Learning.

BU research team help to preserve Madagascar's plants and wildlife

Much of Madagascar's wealth of wildlife and plantlife is unique to the island, given its long isolation from other landmasses. This means it's particularly vulnerable to damage from human activities or changes to the climate, as many species are found nowhere else in the world. With the aid of Bournemouth Natural Sciences Society and Malagasy conservationists, researchers from Bournemouth University are working to preserve the island's plants and wildlife.

Earlier in 2017, Dr Anita Diaz visited Madagascar alongside BU students and Ashley Leftwich of the Bournemouth Natural Science Society, with the intention of working with local botanists to discover the effects of invasive species on local wildlife and plants.

"The people we met took great pride in Madagascar's natural beauty and want to preserve its flora and fauna," explains Dr Diaz, the project's lead researcher, "But they're also facing huge challenges in terms of population growth and desperate poverty. Often the only way to make a living is through 'slash and burn' farming, subsistence farming or mining, all of which have consequences for the natural environment. The exception to this is eco-tourism, which is on the rise, but is still a relatively small part of the economy."

The team worked alongside staff from a project working to re-plant native tree species, which have been significantly depleted as a result of deforestation spanning several decades. Staff working

on the project carefully cultivated the native trees in controlled conditions for a year, before planting them out into the rainforest. Despite the care lavished on the trees, the team found they were rarely surviving due to the impact of invasive species.

"The native trees were almost all dying once they'd been planted in the rainforest," says Dr Diaz, "They needed time and plenty of light to get established, but were simply unable to do so because of the speed of growth of some of the non-native species. It meant much of the team's hard work was going to waste. But by working with local botanists, we were able to demonstrate that a different way of conservation – one that provides employment for local people, while also protecting native species – works extremely well and could make a real difference."

By comparing survival and growth of native trees planted in areas where local people were paid to weed out invasive species with that of trees

planted in the usual way without weeding, the research team were able to show that weeding just for the first year after planting resulted in dramatically improved forest establishment. As well as helping to preserve the native trees, this will also help to restore rainforest habitats for Madagascar's unique wildlife.

"Our research helped to provide the evidence that local conservationists needed to order to be able to make informed decisions about conservation management," explains Dr Diaz, "There are plenty of people in Madagascar who are passionate about preserving their natural habitats and it was great to be able to carry out research to support their goal."

To find out more about Dr Diaz's research and meet some of the team who travelled to Madagascar, drop in to meet them at their interactive stall at the Festival of Learning (Saturday 8 July, 11am – 4pm) or sign up for a talk about their trip (Saturday 8 July, 12:30pm – 1:30pm).

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Making music more accessible for children with profound and multiple learning disabilities

Music technology is often underused in schools for children with Special Educational Needs (SEN), partly because of the costs involved and partly because of a lack of confidence in staff about how to use it. A new research project at Bournemouth University is working in partnership with CODA Music Centre and SEN schools in the local area to develop a solution to this challenge and make music more accessible to all children.

The project is being led by Dr Tom Davis, a senior lecturer in music & audio technology, and supported by his research assistant, Dan Pierson, Dr Ann Bevan and Phil Hallet from CODA. The research team are working with two groups of students from schools in the local area. One group is made up of children with a range of profound and multiples learning disabilities (PMLD) and the other is a group of children with primarily behavioural difficulties.

“The group of children with PMLD have access to a resonance board within their school, which is designed to be very responsive to movement. Any movement on the board will produce a sound and vibration, which can help teach all sorts of skills,” says Dr Davis, “The board is located in the school’s sensory room and isn’t easy to move, so student’s access to it is quite limited unless they’re booked in to use the room. Part of the challenge for us was to create something that could be used anywhere in the school.”

The team have created a more lightweight, portable resonance board for staff and students to use. The resonance board has a built in low frequency speaker that provides haptic as well as sonic feedback. It is designed to be flexible and work with a number of the school’s existing technologies. For example, connecting it to an OmniVista projection system means you can project images to make the resonance board resemble a musical instrument, such as a piano. As well as being more interactive, the new board is easier to move around the school increasing access to a larger range of pupils.

“The feedback we’ve had from staff so far has been really positive, and we’ll be looking to evaluate that more rigorously as part of the project,” says Dr Davis, “It’s a little more difficult to gather feedback from the students involved, but from the way they’ve been engaging and interacting with the resonance board, we can see that they’re getting something from it too.”

As part of the legacy of the project, the team are putting together a website which will include resources they’ve put together as well as a space for teachers, teaching assistants and technicians to add their examples of best practice.

“We wanted to make the results of research widely available to other schools,” explains Dan, “As well as developing our own suggestions for improving access to music; we know that there are some great examples of best practice to be found in schools. We wanted to make sure that people were able to access and share these, which is exactly what we hope the website will do.”

To find out more about the project, visit the Festival of Learning on Saturday 8 July, where you’ll have the chance to see footage of the technology in action and even have a go yourself.



Rebuilding trust in businesses after a scandal

After a scandal the reputation of a business is invariably damaged, but the actions taken by its staff in the immediate aftermath and beyond can help to mitigate – or even worsen – the crisis. Such scandals emerge in the news on a regular basis, with recent examples including United Airlines treatment of its passengers on overbooked flights and computer failure causing widespread flight cancellations for British Airways passengers.

Researchers at Bournemouth University are exploring how consumers have reacted to recent crises and how businesses in different sectors could best respond to a scandal. The project is being led by Dr Julie Robson, an expert in financial services marketing.

“We are exploring consumer’s reactions to a number of recent and on-going scandals, including the misselling of payment protection insurance (PPI), last year’s rollercoaster crash at Alton Towers theme park and Sports Direct’s working practices,” says Dr Robson, “Our research so far has shown that people react in very different ways according to what the scandal is, the type of business involved and how it’s handled.

“Take the PPI scandal, for example. Our focus groups have found that people often view the banking sector quite negatively, because it seems to move from one crisis to another – misselling products, market rigging, handling laundered money – and it never seems to get an opportunity to recover. In the case of Alton Towers, however, consumers have been much more forgiving because they feel the company handled the crisis quite well. They closed the theme park, issued an apology and have done a lot to try and repair their image.

“Sports Direct is different again, as people’s perception is that the issues they’re facing are as a result of the decisions taken by the company’s founder, Mike Ashley. They place the blame on him. Consumers also seem to have much less emotional investment,

as they see a need for Sports Direct – it supplies products at an affordable price, which is what they want.”

The next stage of the project is to interview stakeholders across the three different sectors, to find out how industry as a whole pulls together in a time of crisis. When a scandal emerges, entire industries can be affected, as seen by the VW diesel emissions crisis from 2015. Something on that scale can have an impact on the perception of a whole industry, not just a single organisation.

The results of the project will be developed into a toolkit designed to help businesses explore why they may have lost consumer trust and how they can go about repairing it. This will be widely shared with businesses in a number of different sectors.

“There are a number of different actions businesses can take to start rebuilding that relationship,” explains Dr Robson, “It can be as simple as issuing a swift and sincere apology, to gaining an endorsement, such as getting a quality assurance award. No matter what the step is, it’s important for companies to be telling their consumers what actions they’re taking, as our focus groups show that people don’t always know what an organisation has done to rebuild trust.”

To find out more about this research, sign up for the Festival of Learning event ‘Lies and Scandals: Whatever happened to trust’ which is being run by Dr Robson and Samreen Ashraf on Tuesday 11 July, 5:30pm – 7pm.

