PROYECTO
ESTIMULACIÓN
AUDITIVA PARA
EL APRENDIZAJE
DE IDIOMAS
PUBLICACIONES DE
PRENSA EN INGLÉS
Researchers at the Polytechnic University of Valencia have joined forces with Isora Solutions to test a new approach to language learning: resetting your ears with the goal of recreating the critical period of language learning in childhood.

The goal of the study in the department of Applied Linguistics at the Universitat Politècnica de València (Polytechnic University of Valencia, UPV) and the company Isora Solutions is to analyze the effect of neurosensory auditory stimulation in language learning.

According to the research team, we are all born polyglots—able to differentiate all sounds in all languages—but over time we start to focus on the sounds of our native language, in effect ‘tuning’ our ears to a narrow set of frequencies, at the expense of others. This makes it harder to learn a foreign language as an adult, since it is not just a case of buckling down and learning the grammar, but of a physiological hurdle that prevents us from adequately distinguishing the new language’s full range of sounds. In the current study, the researchers are testing neurosensory auditory stimulation as a means of resetting our ears to regain this starting capacity.

“Spanish-speakers hear frequencies of between 125 and 2,500 hertz; Russians, meanwhile, are able to receive and process frequencies from 25 to 11,000 hertz, which goes some way to explaining their affinity for language-learning,” said Hernán Cerna of Isora Solutions. “What we hope to achieve is to reset our hearing so that we can process the full range of frequencies we are born with.”
In February 2016, researchers began carrying out auditory stimulation sessions on a total of 180 volunteers of all ages (from 19 to 59), using a method and technology developed by the company Tomatis. First, clinical hearing examinations were carried out to establish the good health of the participants’ hearing. Then their level of English (as a foreign language) was assessed, primarily in terms of speaking and listening, in the form of a listening test devised by specialist UPV researchers.

During the 6-month study, participants are undergoing neurosensory auditory stimulation in the form of listening to Mozart pieces that have been filtered to create sudden changes in tone and intensity, which are intended to “surprise the brain.” Study participants listen to the doctored musical masterpieces through purpose-designed bone conduction headphones, whereby they will hear the music not only through their ears but also through their upper brains.

Subsequent sets of auditory stimulation sessions include English-language tests to consolidate improvements to the volunteers’ listening skills in this foreign language. Cerna reported that the idea is to “get the ears to open up to a larger range of frequencies” and, by doing so, boost language receptiveness. The participants undergo the language tests after each session of Mozart to allow researchers to chart each the progress of each participant.

“We hope to show how, through auditory stimulation, it is possible to extend the range of frequencies we are able to process, and that neurosensory linguistic integration is highly efficient for people who want to learn, study, or recover a language,” said Cerna.

Source: *Universitat Politècnica de València.*
Researchers at the Polytechnic University of Valencia have joined forces with Isora Solutions to test a new approach to language learning: resetting your ears in a bid to recreate the ‘critical period’ of language learning.

To analyse the effect of neurosensory auditory stimulation in language learning. This is the objective of a project being carried out by GALE researchers at the department of Applied Linguistics at the Universitat Politècnica de València (Polytechnic University of Valencia, UPV) and the company Isora Solutions.

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Said neurosensory auditory stimulation takes the form of listening to Mozart pieces that have been filtered to create sudden changes in tone and intensity, “which surprise the brain” (Cerna). This surprise should be particularly effective given that the volunteers will be listening to these doctored masterpieces through purpose-designed bone conduction headphones, meaning they will hear the music not only through their ears but also through their upper brains.

The second and subsequent auditory stimulation sessions will include English-language tests to consolidate improvements to the volunteers’ listening skills in this foreign language.

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**First tests**

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The volunteers will undergo these tests after each session of Mozart: “[They] will give us an idea as to the listening skills of each participant in terms of the language being learned and allow us to chart their progress,” Cristina Pérez of the UPV tells us.

“We hope to show how, through auditory stimulation, it is possible to extend the range of frequencies we are able to process, and that neurosensory linguistic integration is highly efficient for people who want to learn, study or recover a language,” Cerna adds.

The project will run for the next six months.

**Story Source:**

Materials provided by Asociación RUVID.
A human brain study using 3D printing technology to grow cells to mimic a real brain, wins the Elsevier’s Atlas award. Other circles show that stimulating the brain could improve language learning and stimulate better athletic performance.

The brain, at two percent of the body weight, comprises some 100 billion nerve cells, and is a vastly complex organ. Scientists can study it using animal models, but in recent years work has gone in to seeking alternatives, with the support of organisations like the NC3Rs (National Centre for the Replacement, Refinement & Reduction of Animals in Research). One alternative is creating models of brains in the lab: growing brain cells in a structural material that lets scientists observe what happens in the tissue. Until recently, this has only been possible in two dimensions, with sheets of cells.
Now Professor Gordon Wallace (right) and his colleagues from the University of Wollongong, Australia together with the University of Texas at Dallas, USA have come up with a way of creating layered 3D structures that mimic the brain more closely, using 3D printing.

“The advent of 3D printing in recent years and the ability to create structures containing materials, and even living cells, gives us that ability to start to probe some very fundamental questions,” said Prof. Wallace. “Looking at what’s going on in 3D - in a similar structure to the real human brain - will give us a much better idea of the biology behind neurodegenerative diseases like Alzheimer’s and Parkinson’s disease, helping researchers to work on ways to treat them.”

The interdisciplinary team consisting of clinicians, biologists, materials scientists and chemists used gellan gum to create the new 3D structures. Gellan gum is a substance made by the bacterium Sphingomonas elodea, which is often used as a gelling agent in microbiology labs. They created a bio-ink using the gellan gum, which they combined with brain cells. The gellan gum helped the brain cells grow well and function as a network - much like in a real brain.

Prof. Kam W. Leong, (left) Editor-in-Chief of Biomaterials, explained the significance of the research, “Inaccessibility to the human brain renders molecular studies challenging, if not impossible. A brain-like structure constructed of human cells would be invaluable for applications ranging from pathway analysis to disease modelling and drug discovery. This excellent proof-of-concept study suggests the possibility of fabricating a human brain-like structure in the future using bio-printing.”

Researchers at UPV (Valencia’s Polytechnic University) join forces with Isora Solutions to test a new approach to language learning by “resetting your ears” in a bid to recreate the ‘critical period’ of language learning. A team of Australian and US researchers discover how to print 3D brain structures so they can grow nerve cells to mimic a real brain. Halo Neuroscience starts selling its headphones that stimulate the brain for improved bicycling performance.

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In this study researchers are testing neurosensory auditory stimulation as a means of resetting our ears to regain this starting capacity. Hernán Cerna (right) of Isora Solutions explains: “Spanish-speakers hear frequencies of between 125 and 2,500 hertz; Russians, meanwhile, are able to receive and process frequencies from 25 to 11,000 hertz, which goes some way to explaining their affinity for language-learning. What we hope to achieve is to reset our hearing so that we can process the full range of frequencies we are born with.”

The neurosensory auditory stimulation takes the form of listening to Mozart pieces filtered to create sudden changes in tone and intensity, “which surprise the brain,” says Cerna. This surprise should be particularly effective given that the volunteers will be listening to these doctored masterpieces through purpose-designed bone conduction headphones, meaning they will hear the music not only through their ears but also through their upper brains.

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Volunteers will undergo these tests after each session of Mozart: “[They] will give us an idea as to the listening skills of each participant in terms of the language being learned and allow us to chart their progress,” says UPV’s Cristina Pérez “We hope to show how, through auditory stimulation, it is possible to extend the range of frequencies we are able to process, and that neurosensory linguistic integration is highly efficient for people who want to learn, study or recover a language”, she adds. The project will run for the next six months.

**Stimulating athletic performance**

Dan Chao (right) is an avid cyclist who likes to train on a stationary bike. Lately while training he’s been using headphones that stimulates his brain. And he claims the device has helped him improve his performance on his real bike. Chao is a cofounder and the CEO of a startup called Halo Neuroscience, which released the neurostimulating headphones, called Halo Sport, last month. The arch of the head phones contains two electrodes that deliver a very small amount of electric current to the wearer’s head, aimed at the neurons in the motor cortex brain region that coordinates movement.
This transcranial direct current stimulation, essentially makes it “slightly easier for the neurons to fire,” Chao says. In principle, that should cause them to form more new connections and he says the company’s research data suggests this effect can be used to help athletes get more out of their training.

Scientists have shown mild stimulation can indeed make neurons more or less likely to fire, and produced promising evidence that the technology could be used to do things like improve cognition, aid in stroke recovery, and make people better at learning motor skills.

But the issue are still hotly under debate whether marketing the technology to consumers is ethical as the existing science doesn’t support claims that the technology can enhance something as complicated as athleticism, and selling the idea to consumers could be unsafe.

**Halo Sport neurostimulator is to pair with athletic training.**

Halo’s early research led Chao and his colleagues to focus on using the technology to stimulate the motor cortex, and to target athletes with their first product. For now, Halo has published a small amount of data on its website. Company researchers found a correlation between transcranial direct current stimulation and an improvement in how quickly a relatively small group of healthy volunteers could learn to play a particular sequence of piano chords!

Another study concluded when paired with practice, the technology enhanced the ability of healthy volunteers to generate force while pinching a strain gauge between the thumb and index finger. A third study concluded the mild neurostimulation, along with a training program, helped elite athletes’ improve their ability to jump.

The company, which has secured $9 million in venture capital from Silicon Valley firms including Andreessen Horowitz and Lux Capital, is offering the Halo Sport to elite athletic teams and organisations, which can buy a “service package” including specific training programs. The US military was its first customer.

John Krakauer, (left) a professor of neurology and neuroscience and director of the Brain, Learning, Animation, and Movement Lab at Johns Hopkins University School of Medicine, is reported as saying it is disingenuous to claim that direct current stimulation of the motor cortex can enhance athleticism, as he comments, the role of the motor cortex in learning, much less in athleticism, is not fully understood.
Flavio Frohlich, a psychiatry professor at the University of North Carolina School of Medicine argues it’s premature to make claims about the efficacy of this technology, because there have been very few carefully done studies involving large numbers of subjects and proper control groups. Frohlich says the technology should not be commercialized without medical oversight, since there is still a lot we don’t know about its effects on the brain, in particular over the long term.

Evidence does suggest transcranial direct current stimulation is safe as long as established protocols are followed. And there is no evidence to long-term risk, says (left) New York’s Marom Bikson, a professor of biomedical engineering at City College, who runs his own company that sells transcranial direct current stimulation devices to researchers.

Chao acknowledges that the physiology of athleticism is complicated, and says Halo is only claiming its device can provide benefits when paired with rigorous training. It’s just “one tool in an athlete’s tool chest,” he says. “You still have to put in the work.”

Astro Headset phones prices range from around £134.99, through £154, and £144.99 to a mere £199
TAKING YOUR EARS BACK TO SQUARE ONE TO IMPROVE LANGUAGE LEARNING

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Source: Universitat Politècnica de ValènciaEn el estudio participan Cristina Pérez y Marta Conejero, del Grupo de Análisis de Lenguas de Especialidad (GALE) del Departamento de Lingüística Aplicada, junto con profesores del Departamento de Economía y Ciencias Sociales, Francisco Guijarro y Fernando García. Está coordinado por Álvaro Capitán y Hernán Cerna, directivos de Isora Solutions y consultores en estimulación auditiva neurosensorial, junto con Carlos García, vicedecano de la Facultad de Administración y Dirección de Empresas de la UPV, en calidad de director de la cátedra.