Keep it complex and improve your brain power

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A participant using Dr Proulx's innovative 'vOICe' software which could help train the brain in new exciting ways.

(Medical Xpress)—If your New Year's resolutions include toning the brain as well as the body, the key could be a vigorous mental workout. Researchers from our Department of Psychology have discovered that persevering with complex tasks could improve our ability to learn.

As part of their research into 'Perceptual Learning', the way in which we develop our senses, Dr Michael Proulx, Senior Lecturer in Psychology,

and Dave Brown, a PhD student at Queen Mary University of London and a research officer at the University, conducted trials to test the ability of volunteers to identify the durations of different sounds.

Previous studies suggest that learning using repeated simple sounds is restricted to the sounds you 'train' on and unfamiliar sounds of different frequencies. In this new study, participants were blindfolded and asked to distinguish a series of subtly different 'complex' sounds varying in tone, pitch and length.

The trials revealed two new findings. First, by using complex sounds people who practised for 10 days were able to identify both new frequencies and new durations. Second, when tested again up to 6 months later, without any additional training, participants were still able to do so. This is far longer than has ever been achieved in similar studies.

Central to the project is a device called The vOICe that turns images into sound to allow blind people to "see" by hearing. This device turns visual images into over 4000 tones, one for each pixel, therefore creating a complex sound for even a simple shape, like a triangle.

The findings have significant implications for people with visual impairments or musicians aiming to improve their listening skills. Learning techniques like this could also help those with hearing or speech difficulties as well as anyone determined to boost their brain power in 2014. Keeping things simple may appear to make learning easier, but stretching yourself from the start might just make learning better.

More information: David J. Brown and Michael J. Proulx, "Increased Signal Complexity Improves the Breadth of Generalization in Auditory Perceptual Learning," *Neural Plasticity*, vol. 2013, Article ID 879047, 9 pages, 2013. DOI: 10.1155/2013/879047

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