

The Empowerment through Science & Technology Initiative (ESTI)

OUR GOAL IS TO PROVIDE YOU WITH ACCURATE
INFORMATION ON SCIENCE, TECHNOLOGY, AND
HEALTH.

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At ESTI, we're hoping to start online workshops on how to use specific technologies and get the most out of your products. If this is something you'd be interested please fill out this survey (https://cutt.ly/ESTI_survey)!

Participate in a study about how COVID-19 and the public health crisis impacts out behavior. Please visit this site (www.colelab.org/covid.html) for more information, and check out this infographic (https://cutt.ly/study_info) on how to sign up.

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MYTH BUSTERS

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1. Mozart effect. (2021, January 23). Retrieved February 25, 2021, from https://en.wikipedia.org/wiki/Mozart_effect#:~:text=The%20Mozart%20effect%20refers%20to,portio n%20of%20an%20IQ%20test.
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MYTH: The Mozart Effect

The "Mozart Effect"[1] was first introduced in 1993 after a short paper[2] was published by psychologist Frances Rauscher[3]. In this study, 36 college students listened to either Mozart, relaxation music, or silence for ten minutes. After ten minutes of each listening session, each student was given three sets of standard IQ spatial reasoning tests. The students' spatial reasoning skills were then tested using the Stanford-Binet intelligence scale[4]. The results showed that students who listened to ten minutes of Mozart did significantly better than those who listened to relaxation music or silence. However, the effects did not go past 10-15 minutes.

These results quickly took off in pop culture, and parents were playing Mozart for their kids in the hopes that it would increase their intelligence.

It was splattered all over the news and health clinics for pregnant women to play Mozart for their unborn child. But, in 1999, psychologist Christopher Chabris[5], conducted an analysis of 16 studies related to the Mozart

effect to test its overall effectiveness. The results showed that the effect is much smaller and less significant, and it seems to be only confined to one of the tests given. Additionally, in 2007, the Federal Ministry of Education and Research[6] in Germany published a second review study[7] involving musically-inclined scientists to look into this phenomenon. They've concluded that there is no compelling evidence that shows that listening to classical music increases a child's IQ.

However, even though the Mozart effect isn't recognized by the science community, companies are still promoting classical music as a way to increase a child's intelligence. The negative effects this may have are parents focusing too much time on classical music which could take away other benefits for their children, such as engaging and playing with them through social activities.

Forecasting Seizures

Seizures are known as abnormal bursts of electrical activity in the brain. Epilepsy is an illness that is described as random occurrences of seizures. This illness often leaves patients in a state of anxiety about when their next seizure could be. However, a study[1] published by Vikram Rao[2], shows that there is a long-term seizure-associated brain rhythms which they call “multidien” (multiday) rhythms. This potentially allows clinicians to give their patients a forecast of when a seizure could possibly occur, similar to a weather forecast.

In this study[3], analysis was done on data collected during a nine-year clinical trial with patients who had a neurostimulator implanted into their brain. The neurostimulator uses a type of electroencephalograph (EEG) to monitor both seizures and interictal epileptiform activity (IEA). IEA is described as a marker of brain irritability observed between seizures by EEG.

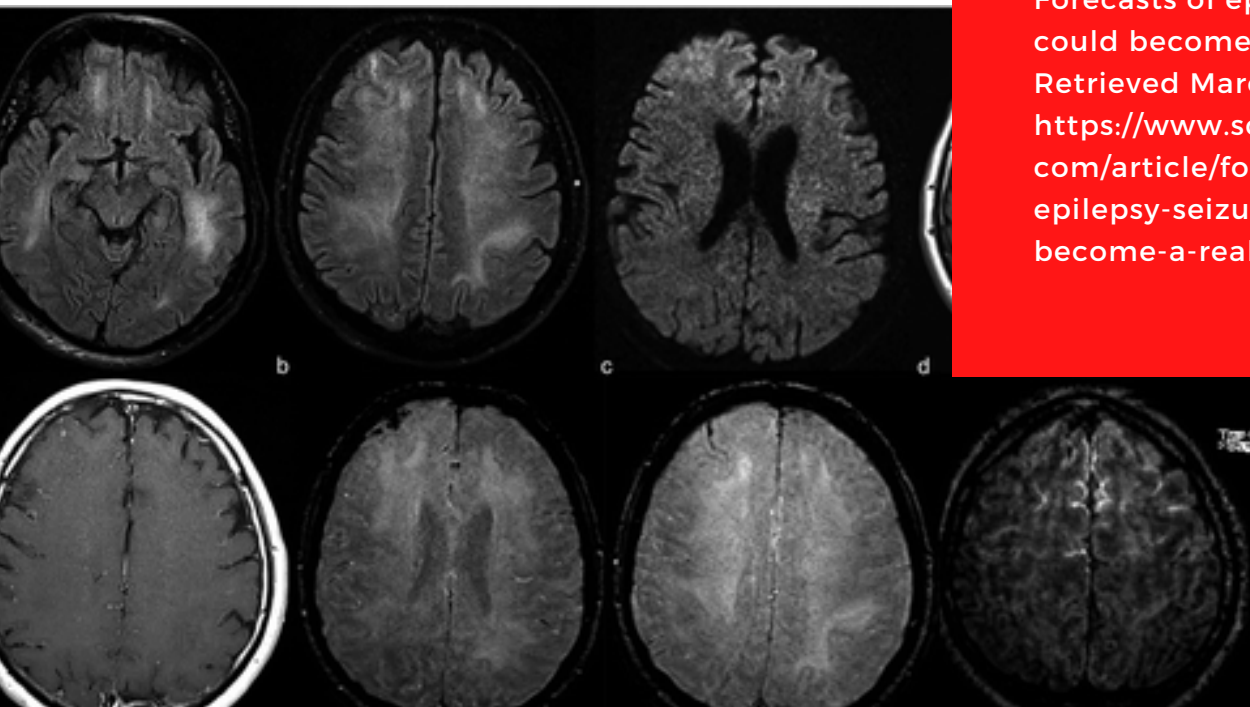
Researchers created a computational model that would forecast seizures. When this model was performed on 18 participants, the model performed significantly better at predicting seizures 24 hours in advance for 15 of the participants. For 2 of the participants, the model was able to forecast seizures up to 3 days in advance. In order to validate this model, researchers tested it on a larger group of participants. With 157 participants, the model was able to forecast seizures 24 hours in advance for 103 participants, and up to three days in advance for 61 participants.

This evidence gives researchers hopes that clinicians will soon be able to provide patients suffering from epilepsy a forecast, similar to the weather, of how likely they are to have a seizure on any given day. Additionally, this will help slow the use of drugs like benzodiazepines, which are typically given to prevent seizures but lose their efficacy with continued use. Therefore, patients will be able to take the drug when they're more likely to possibly have a seizure for that day/week.

Neuro News

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Climate & the Pandemic

This Month in Science

Sources:

1.K. (2020, December 30). What the pandemic can teach us about ways to reduce air pollution. Science News. <https://www.sciencenews.org/article/covid19-coronavirus-pandemic-air-pollution-ozone-shutdown>

The pandemic forced millions of people, especially those living in densely populated cities, to stay indoors during peak infection rates. This created a natural experiment for climate scientists to study air pollution.

In April 2020, when New York City was in lockdown, scientists noticed a 17% drop in greenhouse gas emissions. However, this soon climbed back up during the summer when lockdown restrictions began to lessen. In 2020, CO₂ emissions were only 7% less than that of 2019, which is not enough to halt climate change.

Additionally, this natural experiment gave scientists the opportunity to understand how air pollutants affect air quality in cities. Data shows that the pandemic's impact on levels of pollutants was highly regional and affected by differences in wind, rain, and sunlight - which all change depending on the season. From March 15 to July 23, New York City had a 21% decrease in nitrogen dioxide emissions, compared to 2019. Evidence shows that this is strongly linked to a reduction in ozone levels during the summer months. This will allow policymakers to focus nitrogen dioxide regulations in the summer months.



COVID-19 & its Variants

With COVID-19 continuously spreading at an alarming rate, new variants have been discovered in Britain, South Africa, and Brazil. With the emergence of these new variants, many people are worried if the vaccines will help protect against them.

So far, evidence suggests that the vaccines will still provide defense against severe illness. Researchers have discovered that the variants from Britain and Brazil don't have the same mutations that make them susceptible to the vaccine compared to the variant from South Africa.

Scientists continue to urge the public to get the vaccine once available to them to prevent serious illness, hospitalization, and/or death. Additionally, in order to prevent new variants from emerging, continue to wear masks, social distance, and get tested.

For more information about these new variants, check out our section on COVID-19 Variants: www.estri.rutgers.edu/covid-19/

Health

Sources:

1. Mandavilli, A. (2021, February 1). Emerging Coronavirus Variants May Pose Challenges to Vaccines. The New York Times. <https://www.nytimes.com/2021/01/20/health/coronavirus-variants-immunity.html>

