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WHAT'S NEW IN SCIENCE?

What makes us share posts on social media?

The average internet user spends nearly three hours a day using social media. It's clear that social media is becoming increasingly crucial to sharing important information with the public, for example - how to stay safe from COVID-19. Researchers want to know what makes a piece of media compelling enough for people to share it online.

A new study published in the Journal of Experimental Psychology: General led by University of Pennsylvania, United States researchers Danielle Cosme and Emily Falk analyzed the behaviour of more than 3,000 individuals to explore the psychology behind sharing information online. It turns out that the answer is quite straightforward: People share information that they feel is meaningful to themselves or to the people they know. Cosme test what contributes to "value-based virality" - essentially that information on the internet can go viral because people find it inherently valuable, either to themselves or to society.

"This finding is key to crafting effective messaging for social causes", says Cosme. Knowing the psychological ingredients that make a person share a post on social media can help scientists share facts about climate change or public health officials dispel myths about vaccines. Cosme's research shows that people pay more attention to information they perceive to be related to themselves.

Humans are social beings and love to connect with each other. When we communicate with others, we consider what the other person is thinking or wants to hear - a quality known as social relevance.

For Cosme's study, participants were exposed to articles and social media posts about health, climate change, voting and COVID-19. Some participants read headlines and summaries of news articles, others looked at social media posts. All of the participants rated how likely they were to share each message and how relevant they found each one to themselves and to people they know.

The Researchers found that no matter the topic covered or the medium of the message, people were most likely to say they would share messages that they perceived as self or socially relevant.

With data on tens of thousands of messages, Cosme believes this finding can help shape effective public messaging on social media. "We are interested in understanding how we can translate psychological theory into real-world interventions to try to promote behavior change," Cosme says.

One way to improve content sharing is to recruit people who find the content self or socially relevant to share messages online. Another is to frame messages to be seen as more self- or socially relevant by audiences without tailoring the messages themselves.

The Communication Neuroscience Lab, Philadelphia, Pennsylvania, United States is continuing this research by looking at brain activity in relation to social media sharing. For these studies, the researchers are using FMRI (Functional Magnetic resonance Imaging) scanners to understand how specific regions of the brain shape perceptions of self and social relevance.

Overall, Researchers hope that the results of the study will give those wanting to create social change the tools to do so effectively. "Big issues require collective action," Cosme says. Spreading accurate information empowers individuals to join together and act. This study highlights key psychological ingredients that motivate people to share information about topics that impact our well-being. Sharing is one key lever for shifting cultural norms and motivating larger scale action.

SCIENTIST OF THE MONTH

Kiran Kumar Aluru Seelin

Kiran Kumar Aluru Seelin was born on 22nd October, 1952 in Hassan District, Karnataka. He graduated in Physics in 1971 from the National College of Bangalore University. This was followed by a Degree of M.Sc in Electronics from the same National College of Bangalore University in 1973. His further studies were at the Indian Institute of Science, Bangalore from where he passed M.Tech in Physical Engineering, in 1975. Kiran Kumar started his career joining Space Applications Centre, Ahmedabad in 1975, working on Space borne Electro-Optical imaging instruments. He also served as the chairman of ISRO (Indian Space Research Organisation) from January 2015 to January 2018.

Kiran Kumar is known to have made contributions to the Indian Space Programmes from the early projects like Bhaskara TV payload till the later programmes such as Chandrayaan-1 and Mangalyaan. Kiran Kumar is credited with the design and development of the Electro-Optical image sensors used in India's first remote sensing satellite, Bhaskara, launched in 1979 and the subsequent one in 1981, as well as the ocean colour instruments used in weather forecasting, sea zone/landscape mapping and telecommunications. He is also reported to have contributed to the design and development of the imaging instruments for projects such as INSAT3D, Resourcesat, Micro Satellite and Cartosat.

Kiran Kumar has received many awards and honors, starting with the Indian Society of Remote Sensing Award in 1994. In 1998, he received the Vasvik Award, The Indian Space Research Organisation honoured Kumar with the Individual Service Award in 2006. He received The Bhaskara Award of the Indian Society of Remote Sensing came in 2007. In 2014, he was awarded the Padma Shri for his contributions to the fields of Science and Technology. He is known as a 9th Chairman of the Indian Space Research Organisation (ISRO).

SCIENCE FACTS OCTOBER 2022

Breast Cancer Awareness Month	
1st Oct	World Habitat day (1st Monday of October) (by U.N.)
3rd Oct 1803	Johan Gorrie (Inventor of a Cold Air Process of Refrigeration) was born.
4th Oct 1832	William Griggs (Inventor of Photo Chromo Lithography) was born.
4th Oct 1957	Soviet Union launched first artificial Earth Satellite named "Sputnik-1"
4th Oct	World Space Week (by U.N.)
5 th Oct	World Teachers Day. (by UNESCO)
5 th Oct 1864	Louis Lumiere (Inventor of first Motion Picture Camera) was born.
6 th Oct 1893	Maghnad Saha (Great Indian Astrophysicist) was born.
8th Oct 1917	Rodney Rabert Porter (Discoverer of exact Chemical Structure of Antibody) was born
10th Oct 1731	Henry Cavendish (Discoverer of Hydrogen gas) was born.
11th Oct	International Day of the Girl Child (by U.N.)
12th Oct 1860	Elmer Sperry (Inventor of the Gyro Scope) was born
16th Oct	World Food Day (by U.N.)
19th Oct 1783	The first manned balloon flight done by Scientist Jean Francois Pilatre de Rozier.
19th Oct 1910	Subrahmanyan Chandrasekhar (Nobel Prize winner Astrophysicist of India) was born.
20th Oct 1891	James Chadwick (Discoverer of Neutron) was born.
21th Oct 1833	Alfred Nobel (Inventor of Detonator for Dynamite & Nitro-Glycerine) was born.
22th Oct 1896	Charles Glen King (Discoverer of Vitamin C) was born.
22th Oct 1905	Karl Jansky (Discoverer of Cosmic Radio Wave Emission) was born.
27th Oct 1811	Issac Singer (Inventor of Home Sewing Machine) was born.
28th Oct 1914	Jonas Salk (Inventor of Polio Vaccine) was born.
29th Oct 1656	Edmond Halley (Discoverer of Halley's Comet) was born.
U. N. : United Nations WHO : World Health Organization	

Answers: 1) c, 2) b, 3) b, 4) b, 5) c, 6) b, 7) a, 8) a

Timings
Tuesday to Sunday
& Public Holidays
9.30 am to 4.30 pm

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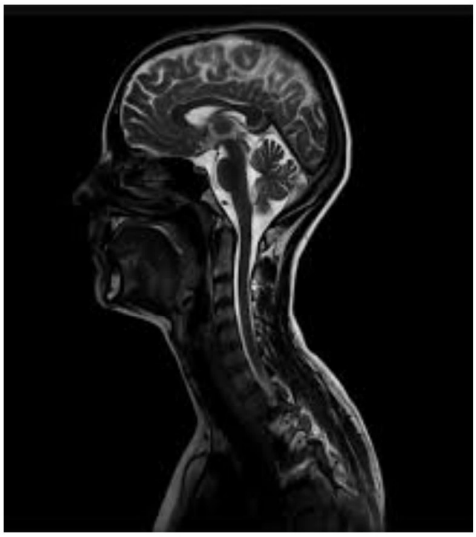
SCIENTIFIC QUESTION

What is MRI (Magnetic Resonance Imaging) ?

MRI (Magnetic Resonance Imaging) is a medical imaging technique used in radiology to form pictures of the anatomy and the physiological processes of the body. MRI scanners use strong magnetic fields, magnetic field gradients and radio waves to generate images of the organs in the body. MRI does not involve X-rays or the use of ionizing radiation. MRI is a medical application of Nuclear Magnetic Resonance (NMR) which can also be used for imaging in other NMR applications, such as NMR spectroscopy.

MRI is widely used in hospitals and clinics for medical diagnosis, staging and follow-up of disease. MRI was originally called NMRI (Nuclear Magnetic Resonance Imaging), but the word "nuclear" was dropped to avoid negative associations. Certain atomic nuclei are able to absorb radio frequency energy when placed in an external magnetic field, the resultant evolving spin polarization (the intrinsic angular momentum of elementary particles is aligned with a given direction) can induce a RF (Radio Frequency) range from 20 KHz to 300 GHz signal in a radio frequency coil and thereby be detected.



In clinical and research MRI, hydrogen atoms are most often used to generate a macroscopic polarization that is detected by antennae close to the subject being examined. Hydrogen atoms are naturally abundant in humans and other biological organisms, particularly in water and fat. For this reason, most MRI scans essentially map the location of water and fat in the body.

Mechanism:

In the most medical applications, hydrogen nuclei, which consist solely of a proton, that are in tissues create a signal that is processed to form an image of the body. Given that the protons are affected by fields from other atoms to which they are bonded, it is possible to separate responses from hydrogen in specific compounds. To perform a study, the person is positioned within an MRI scanner that forms a strong magnetic field around the area to be imaged. First, energy from an oscillating magnetic field is temporarily applied to the patient at the appropriate resonance frequency (increased amplitude that occurs when frequency of an applied force is equal to natural frequency of system). Scanning with X and Y gradient coils causes a selected region of the patient to experience the exact magnetic field required for the energy to be absorbed. The atoms are excited by a radio frequency (RF) pulse and the resultant signal is measured by a receiving coil.

Diagnostics:

Usage by organ or system: MRI has a wide range of applications in medical diagnosis and more than 25,000 scanners are estimated to be in use worldwide. MRI is the investigation of choice in the preoperative staging of rectal (cancer in colon or rectum- parts of the large intestine) and prostate cancer and has a role in the diagnosis, staging, and follow-up of other tumors.

Neuroimaging: MRI is the investigative tool of choice for neurological cancers over CT (Computerized Tomography), as it offers better visualization of the posterior cranial fossa (part of the cranial cavity, located between the foramen magnum and tentorium cerebella), containing the brainstem (stalk-like part f the brain that connects cerebrum with spinal cord) and the cerebellum (little brain).

Cardiovascular: Cardiac MRI is complementary to other imaging techniques, such as echocardiography, cardiac CT, and nuclear medicine. It can be used to assess the structure and the function of the heart.

Also, MRI techniques can be used for Musculoskeletal (spinal imaging, assessment of joint disease and soft tissue tumors), detect lesions liver and gastrointestinal and angiography.

KNOW THE EXHIBIT

Early Rockets: Part-5

In the first quarter of the last century, Nazi Germany (it was the German State between 1933 to 1945, when Adolf Hitler and the Nazi Party (National Socialist German Worker's Party) controlled the country and transformed it into a dictatorship) was progressing at an unprecedented pace in the field of Rocket Science. Hermann Oberth, a German Scientist wrote a book Die Rakete Zu Den Planetanraumen (by Rocket to Space) on space flight and their designs. Young Wernher Von Braun, inspired by that book, started working with Oberth in his Liquid-Fuelled Rocket Motor tests. Before World War II, Von Braun became the Technical Chief of the Rocket-Development Facility of Nazi Germany. Under the Directorship of Von Braun, Germany developed V2, the first long-range ballistic missile. The "V" in V2 stood for Vergeltungswaffe (Vengeance Weapon). V2 was able to travel 3500 miles per hour, with a range of 200 miles and a maximum altitude of 55 mile and could deliver a 1-ton explosive to the heart of London. V2 was the most powerful Rocket of that time. Impressed by the "Wonder Weapon" V2, Hitler authorized its deployment in large numbers. Nearly 5700 V2s were built and around 20,000 prisoners from concentration camps died while working. Some test fires were performed and around 2700 British people died in those test fires. But by the time, a full proof V2 could blast off. It was too late to affect the outcome. Adolf Hitler committed suicide after that Germany was defeated. After World War II, Von Braun and his fellow Scientists moved to USA. USSR (Union of Soviet Socialist Republics) took control over the test Laboratories of V2. Later Von Braun became Director of NASA's Marshall Space Flight Center and designed the Saturn V, The Rocket that took U.S Astronauts to Moon. On the otherhand, USSR developed Soyuz Rocket Series following the designs of V2.

This Exhibit is situated at "Entering Space Gallery" between Fun Science Gallery and Power of Play Gallery at the first floor of Science Centre.

Inauguration of 'Khoj Museum' at Science Centre Surat

"KHOJ- Science + Art +Innovation" Museum is a museum for children which is developed under the leadership of Surat Municipal Corporation in collaboration with Gujarat CSR Authority and CSR support of Dakshin Gujarat Vij Company Ltd. in the premises of Science Centre Surat, City Light Road, Surat. The CSR fund used for the development of Khoj Museum, Surat is 52 lacs.The e-inauguration of Khoj Museum has been done by Hon. Prime Ministershri on 29 September 2022.

The KHOJ Museum, Surat mainly consists of two galleries, a workshop area and a space of hall of fame. First "Virosphere" Gallery is an experience about Virus and multiple aspects of Virus life and other gallery showcases the theme of 'Sustainable Development Goals' and in workshop promoting a student to become an Artist, a Scientist, a Technology loving Mechanic, Sustainability Soldier, a Musician, etc. Hall of Fame displays the ideas and creations by students.

QUIZ

1. Which one of the following instruments is used to measure humidity?
a) Anemometer b) Ameter c) Hygrometer d) Barometer

2. Which two planets are most similar in size diameter wise?
a) Mars and Mercury b) Venus and Earth c) Uranus and Neptune d) Jupiter and Saturn

3. What cause the disease Toxoplasmosis?
a) A bacterium b) A protozoan c) A virus d) A prion

4. Louis Pasteur developed which vaccine?
a) Polio b) Rabies c) Small pox d) Anthrax

5. What determined the Loudness of Sound?
a) Pitch b) Frequency c) Amplitude d) Time Period

6. What acid rain contains?
a) Sodium Chloride b) Sulphur Dioxide and Nitrogen Dioxide c) Hydrochloric Acid d) Carbon Tetra Chloride

7. In which of the following cell walls is found?
a) Plant cells only b) Animal cells only c) Both (a) and (b) d) None of them

8. What is the other name of cell membrane?
a) Plasma membrane b) Cell wall c) Nuclear membrane d) None of these