Mumin Khan

Dr. Alex Hughes

W241: Experiments

Speaking Science

Research Question

Science communication is really hard. For years, Scientifically purposed organizations have struggled to engage with the public like their for-profit business counterparts do. As a result, scientific understanding in the public is middling. Even when scientific topics are well and clearly articulated, results and their implications are often met with rejection or apathy. Worse yet, STEM education and jobs continues to struggle to attract and retain minorities and female participants, perpetuating already low participation in the STEM workforce and, in turn, income inequality.

This research proposal aims to quantify the effect of language complexity on understanding and engaging with scientific discoveries. More specifically, this proposal will analyze the construction of social media posts intended to drive internet traffic towards an article that speaks to a scientific topic or discovery. More concretely: What kind of tweet gets people to click on a new exoplanet official announcement? Aside from the most generally effective social media post style, we hope to answer a few other, more nuanced, questions enumerated in the Outcome Measures section below.

Finding Subjects

This experiment will take the form of an in-person survey via Qualtrics or similar. We hope to survey members of the general American public ages 13 and up. Doing so will require boots on the ground in public places (e.g. coffee shops, malls, popular sidewalks). We hope to keep the survey short enough to collect > 300 responses

efficiently. We do not plan on using Mechanical Turk or other pay-per-task services to collect responses. We plan on blocking our subjects by education level, as we'd expect different engagement patterns between high school students and people with advanced degrees.

Treatment Strategy

Existing NASA social media posts from the last 5 years will be collected and divided into simple, standard, and advanced categories based on the language they employ. Treatment and control groups will be assigned at random. The control group will be given the simplest social media posts. Treatment groups will receive social media posts of increased complexity. After reading each social media post, survey respondents will be asked how likely they would be to click on the attached link.

Statistical Analysis

After we conclude collecting data, we will conduct a sharp null hypothesis test on our collected data to determine whether the observed average treatment effect could have occurred by chance.

Outcome Measures

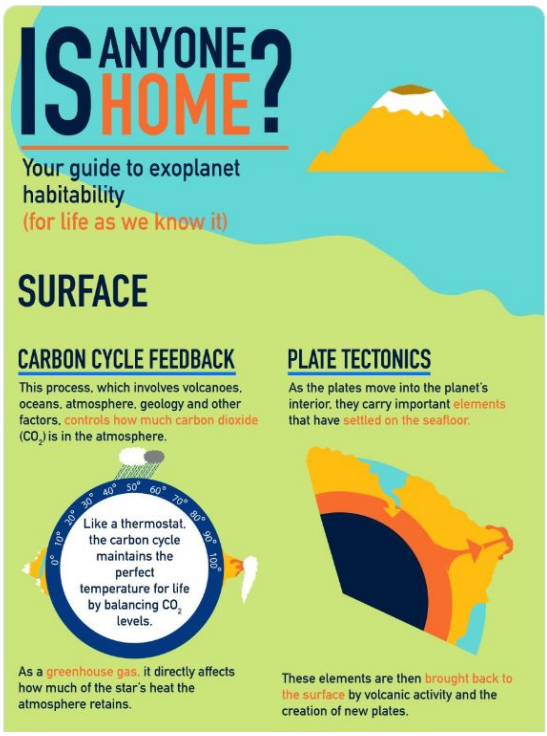
The primary outcome measure of this proposal is engagement, or how likely each individual is to click on the link. Other outcomes might include content comprehension / topic retention.

Example Social Media Posts

NASA Exoplanets ✓
@NASAExoplanets

In the #SearchForLife, a planet's surface features are also important.

Volcanoes🌋, for instance, could bring important elements like CO2, nitrogen and water, needed for life (as we know it) to a planet's surface.



NASA Exoplanets ✓
@NASAExoplanets

Our Spitzer Space Telescope just ended a successful 16+ year mission. It was one of @NASA's Great Observatories along with @NASAHubble, @chandraxray & Compton. You could even call them ... super😉

See how they changed our view of the cosmos⬇️

Spitzer and NASA's 'Great Observatories' Space Telescopes
This is the animated tale of the Spitzer spacecraft and the space telescope superteam known as NASA's Great Observatories, which also includes Hubble, Chandra and Compton.

8:23 AM · Feb 2, 2020 · Twitter Media Studio

NASA Exoplanets ✓
@NASAExoplanets

.@NASAspitzer made some of the first exoplanet atmosphere studies & confirmed 2 and discovered 5 of the 7 TRAPPIST-1 worlds, the largest planetary system we know of – other than our own.

We celebrate #SpitzerFinalVoyage as it nears end of mission Jan. 30. go.nasa.gov/35ZFuFE