

Using Location Analytics to Understand How Personality Traits Can Affect People's Exposure to Diverse Beliefs, Opinions, and Interests

Overview: Investigating How Certain Personality Traits Can Protect Individuals from Living in Echo Chambers

THE CLIENT

Founded in 1754 and based in New York City, Columbia University is a leader in higher education in the nation and across the globe. As one of the world's most important centers of research, Columbia attracts a diverse and international faculty and student body to support research and teaching on global issues.

Within the Ivy League university, Columbia Business School offers students unparalleled access to learn from leaders from across industries—in the classroom, throughout the city, and around the globe. The school's alumni are tackling the increasingly complex problems of today and making a difference in their own industries and society at large.

At Columbia Business School, Sandra Matz is the David W. Zalaznick Associate Professor of Business. As a computational social scientist, she studies human behavior and preferences using a combination of Big Data analytics and traditional experimental methods. Through her research, she aims to understand how psychological characteristics influence real-life outcomes with the goal of helping businesses and individuals make better decisions.

THE PROBLEM

Recently, there has been a growing concern about the negative impacts of echo chambers, environments in which people encounter only beliefs or opinions that coincide with their own, reinforcing their existing views while limiting exposure to alternative ideas. Many times, echo chambers are thought of in regard to political beliefs; however, echo chambers can limit a person's viewpoint on any topic.

Most of the public discourse on echo chambers centers on how social media platforms and their recommendation algorithms reinforce individual preferences by determining what content users should see on their sites based on users' previous behaviors, such as what they have viewed, bought, or done in the past.

Although social media may support the creation and exacerbation of echo chambers, Professor Matz hypothesized that an individual's personality traits could also play a key part in whether or not they are receptive to new ideas, to being friends with people who have different views, or to having a diverse set of interests that allow them to encounter different opinions and beliefs.



A personality trait that Professor Matz wanted to examine more closely was Openness-to-Experience, a characteristic of people who prefer variety over convention. Previous research has found that open-minded people have more complex and comprehensive interpretations of the world because they have a stronger tendency to seek out, understand, and engage with information.

Because of this, it's been theorized that open-minded people value diversity of opinion more than their traditional counterparts. Despite this theory, there was little empirical evidence to support it, so Professor Matz sought to develop a way to investigate and prove that Openness is in fact related to higher levels of psychological interest diversity (i.e., how diverse a person's interests are when it comes to the psychological profiles of the people who are typically associated with those interests).



"To research how the personality trait of Openness could protect people from living in personal echo chambers, I sought to measure how psychologically diverse people's interests are based on their everyday activities. Are you someone who is only interested in highly social and extraverted hobbies? Or do you also sometimes seek out activities that are more reserved and introverted? I determined that GPS-tracked event attendance data would be an ideal way to gain real-world insight into participants' interests."

Sandra Matz, Associate Professor of Business, Columbia Business School

THE SOLUTION

To gain insight into the diversity of interests of the participants in the study, Professor Matz worked with Gravy Analytics to obtain event attendance data, compiled from the location signals of mobile devices.

Through its Visitations Data-as-a-Service (DaaS) product, Gravy shared a dataset of mobile devices opted into location services that were observed at various events across the country that took place at commercial locations of interest, such as entertainment venues, sports arenas, restaurants, gyms, and more. Specifically, the event attendance data included that of individuals who had attended at least 20 events within the sixth-month period between January 1 and June 30, 2018. Gravy's data was selected for its high quality and accuracy, as each visit was verified through Gravy's patented AdmitOne™ verification engine and contextualized with place and event metadata.



With Gravy Visitations data, Professor Matz was able to use trustworthy event attendance data as a base to further build out her study. Gravy shared the event attendance data classified into broad categories (e.g., "comedy," "museums & attractions," "meditation," etc.). In order to estimate the appeal each event category has to various types of people, Professor Matz surveyed over 170 people and asked them to rate each event category by political orientation and Big Five personality traits:

- **Political Ideology:** conservative/republican to liberal/democrat
- **Openness:** conventional/uncreative to open-to-new-experience/artistic
- **Conscientiousness:** disorganized/careless to dependable/self-disciplined
- **Extraversion:** reserved/quiet to extraverted/enthusiastic
- **Agreeableness:** critical/quarrelsome to sympathetic/warm
- **Neuroticism:** anxious/easily upset to calm/emotionally stable

Professor Matz then matched a separate dataset of the study's participants' own Big Five personality scores to the event attendance data (categorized by personality traits and political orientation) to find out if an individual's personality traits make them more or less likely to be open to different views and new ideas.

AT A GLANCE, THE STUDY REVEALED:



Higher levels of Openness were found to be significantly associated with higher levels of interest diversity. These findings imply that individuals scoring high on the personality trait of Openness also have a propensity to exhibit greater variety in their preferences and interests as revealed by the events they attend on a regular basis.



Openness and topical interest diversity were positively correlated, indicating that Openness predicts both topical and psychological interest diversity. In other words, people who score high on the personality trait of Openness have more diverse sets of interests in terms of the types of things they are interested in as well as the psychological perspectives of the people associated with these interests.



The results emphasize the role of individual differences in the development of personal echo chambers. They specifically demonstrate that the extent to which people encounter diverse worldviews and perspectives partly depends on their level of Openness.

The complete research study can be found [here](#).

THE RESULTS

The resulting data and analysis helped Professor Matz to:



Determine how personality traits can expose or protect individuals from echo chambers.

By understanding which people may be prone to lower levels of psychological interest diversity, it is possible to identify and support individuals who are most susceptible to falling into personal echo chambers.



Strengthen the understanding of the personality trait of Openness.

The study's results are the first large-scale, behavioral evidence corroborating the theoretical idea of Openness as a preference for variety. While this had been a fundamental idea since the trait's inception, there wasn't much empirical evidence from previous research studies to support the assertion using actual behavioral data collected in natural settings and large samples until this study.

IMPROVED PERSONALITY AND HUMAN BEHAVIOR RESEARCH WITH LOCATION ANALYTICS

Researchers can utilize high quality, real-world mobility data to uncover new insights about personality and human behavior that can in turn make a lasting impact on society. With Gravy Analytics' Visitations data, Columbia University was able to demonstrate that people rating highly in the personality trait of Openness are more likely to have a psychologically diverse set of interests than their traditional counterparts. This discovery will undoubtedly be integral to the future development of strategies to protect individuals from living in personal echo chambers, something that has been exacerbated by traditional and social media in recent years.



“Gravy’s Visitations data played a critical role in my research study. The data enabled me to empirically test a relationship that many psychologists could only theorize before: Open-minded people have interests that are more psychologically diverse than those of their more conventional counterparts. Now that this idea has been supported by real data, others in the research community and I can further explore how to protect individuals from falling victim to personal echo chambers.”

Sandra Matz, Associate Professor of Business, Columbia Business School

ABOUT COLUMBIA BUSINESS SCHOOL

For over 100 years, Columbia Business School has helped develop leaders who create value for business and society at large. Today, the school is guiding students to solve the increasingly complex challenges of the modern business era with its cutting-edge curriculum, groundbreaking research, commitment to an inclusive and representative community, and real-time connection to industry and practice, both within New York City and around the world. From pioneering courses to STEM certification to unique immersive and experiential learning opportunities, the school's curriculum continues to expand and evolve. Infusing management fundamentals with data science and of-the-moment business intelligence, Columbia Business School delivers unmatched insights and learning across key areas of business, including digital transformation, entrepreneurship and innovation, twenty-first century finance, the intersection of business and society, and climate and sustainability. To learn more, visit gsb.columbia.edu.

ABOUT GRAVY ANALYTICS

Where people go and why tells the story of our world. Founded in 2011, Gravy Analytics is the enterprise location technology company providing actionable intelligence to businesses. Using its patented technology, the company brings data about people, places, and events together to understand human mobility, helping companies enhance their sales and marketing strategies and optimize business operations. Today, the company's intelligence powers leading-edge solutions for a wide range of industries—from advertising to market research, financial services to supply chain risk management—that rely on knowing how people, products, and materials move throughout the world. For more information, please visit gravyanalytics.com.



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