Finding psychological insights through social media

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Social media has opened up a new digital world for psychology research. Four researchers will be discussing new methods of language analysis, and how social media can be leveraged to study personality, mental and physical health, and cross-cultural differences. The speakers will be presenting their research during the symposium "Finding Psychological Signal in a Billion Tweets: Measurement Through the Language of Social Media," at the Society for Personality and Social Psychology (SPSP) 16th Annual Convention in Long Beach, California.

Collaborating with computer scientists

Researchers have long measured people's thoughts, feelings, and personalities using survey questions. The widespread use of Twitter and Facebook has afforded new approaches to social science research, and requires new techniques to analyze and interpret data using computer science methods. These techniques allow researchers the ability to generate insights from large-scale data sets.

"Collaborations between psychologists and computer scientists can yield studies and insights that would not likely have been conceived independently by researchers from either field," says Andy Schwartz of the University of Pennsylvania.

A study utilizing open-vocabulary analysis found striking variations in language with personality, gender, and age. Certain words and phrases

can provide novel and detailed insights. For instance, men used the possessive 'my' when mentioning their 'wife' or 'girlfriend' more often than women used 'my' with 'husband' or 'boyfriend.' Open-vocabulary analysis can find connections that are unanticipated and often are not captured by other analysis techniques.

"Data-driven techniques are mostly limited to finding correlations rather than causation...Future analyses are moving beyond words to capturing less ambiguous meanings from language," explains lead researcher Andy Schwartz. Collaboration between social and personality psychologists, and computer scientists, will be integral to moving that research forward.

Assessing personality with Facebook

Researchers have found that words used on Facebook are surprisingly reliable indicators of personality. Their [results](link) are published in the *Journal of Personality and Social Psychology*. The researchers utilized predictive algorithms of the language to create efficient large-scale personality assessments. The automated language-based models of traits were consistent with the participants' self-reported personality measurements.

Lead author Gregory Park confirms the reliability of the language-based model: "We evaluated the method in several ways. Predictions from the automated methods can accurately predict the scores the users receive on personality tests. They are consistent with personality ratings made by the users' actual friends, and other personality-related outcomes, such as the number of friends, or self-reported political attitudes."

Another [study](link), published in the journal *Assessment*, analyzed Facebook statuses of study participants using open-language analysis. The researchers generated word clouds that visually illustrated how several personality traits (extraversion, agreeableness, conscientiousness,

emotional stability, and openness) appear on Facebook.

The study found that certain phrases are predictive of specific personality traits. For example, individuals who score high in neuroticism on a self-reported personality assessments are more likely to use words like sadness, loneliness, fear and pain. Analyzing this data may provide novel connections that may not be apparent in traditional written questionnaires and surveys.

Tracking community health through Twitter

In a study recently published in the journal *Psychological Science*, researchers compared tweets and heart disease at the county level. The study found that language analyses may predict heart disease risk as well or better than traditional epidemiological risk factors.

"Language associated with anger, negative emotions, hostility and disengagement within a community was associated with increased rates of heart disease," explains lead author Johannes Eichstaedt, "Language expressing positive emotions and engagement was associated with reduced risk."

Twitter users are not necessarily individuals at-risk for heart disease, but rather, they can serve as canaries for communities with higher heart disease risk. Tweets can represent the overall negativity a community is feeling, and indicate the social and environmental stresses that contribute to increased heart-disease risk.

The results of the study illustrate that Twitter serves as an accurate predictor of health and risk factors of a community. Eichstaedt and his colleagues are now analyzing words and phrases on Twitter to track depression and anxiety across populations.

Cultural variation in language

Social media allows researchers to examine similarities and differences across cultures at a new level. Cross-cultural studies typically require time-intensive qualitative analyses with a small number of people. Margaret Kern of the University of Melbourne and Maarten Sap of the University of Pennsylvania are using Twitter to study variations in language use across cultures.

Using differential language analysis the researchers examined Twitter posts from eight countries (United States, Canada, United Kingdom, Australia, India, Singapore, Mexico, and Spain) and two languages (English and Spanish).

The researchers found that there were many similarities across countries, with emoticons and iconic pop artists correlating with positive emotions and curse words, and aggression correlating with negative emotions. There were also differences that point to culture-specific correlations for emotional expression. Results of the study are still preliminary, and have not yet been published.

"A challenge for us is understanding how to interpret any differences we see- is it a really difference, or simply noise? In the future, we hope to work directly with people from these cultures to help us interpret and understand the results," explains lead researcher Margaret Kern.

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