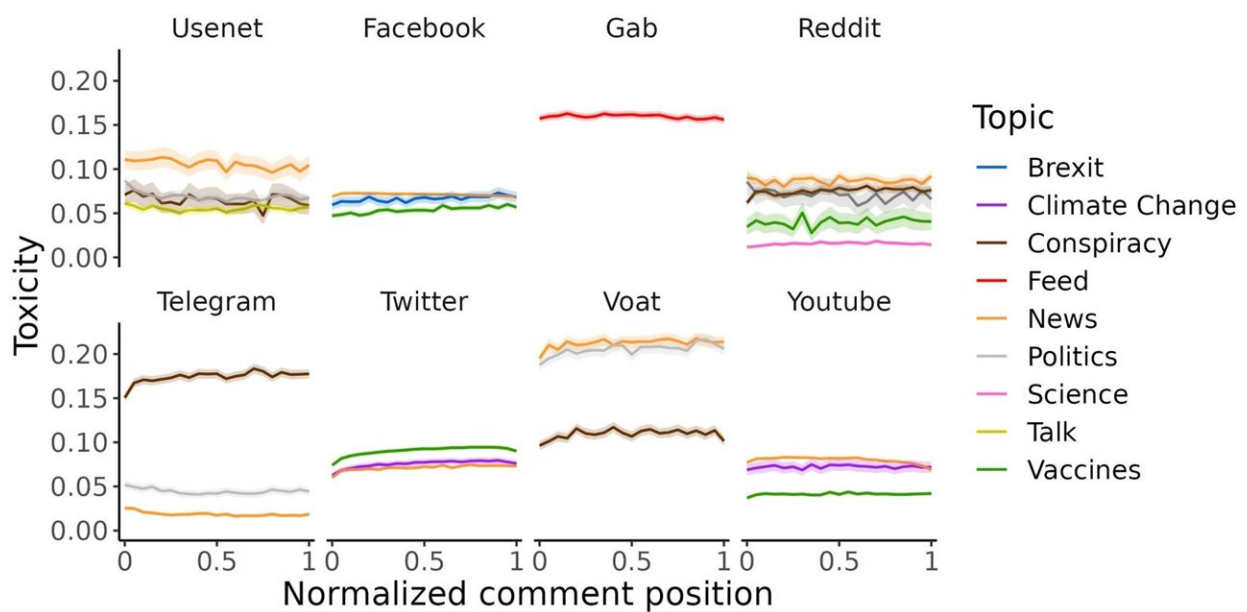


New study suggests that while social media changes over decades, conversation dynamics stay the same

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User toxicity as conversations evolve. Mean fraction of toxic comments as conversations progress. The x-axis represents the normalized position of comment intervals in the threads. For each dataset, toxicity is computed in the thread size interval $[0.7-1]$. Trends are reported with their 95% confidence interval. Color-coded legend on the side. Credit: *Nature* (2024). DOI: [10.1038/s41586-024-07229-y](https://doi.org/10.1038/s41586-024-07229-y)

Published in [Nature](#), a new study has identified recurring, 'toxic' human conversation patterns on social media, which are common to users irrespective of the platform used, the topic of discussion, and the decade in which the conversation took place.

In particular, the study suggests that prolonged conversations on social media are more prone to toxicity and polarization when divergent viewpoints from debate lead to an escalation of online disagreement.

Contrary to the prevailing assumption, the study suggests that toxic interactions do not deter users from engagement, they actively participate in conversations. It also suggests that toxicity does not necessarily escalate as discussions evolve.

The study was led by the Center for Data Science and Complexity for Society at the Department of Computer Science, Sapienza University of Rome, in collaboration with City, University of London, and the Institute of Complex Systems, CNR, Rome.

Growing concern surrounds the impact of social media platforms on [public discourse](#) and their influence on social dynamics, especially in the context of toxicity.

The study employed a comparative approach across eight social media platforms to explore critical factors related to the persistence of toxic interactions in digital communities. The platforms included the more contemporary Facebook, Reddit, Gab, and YouTube, and the older USENET, a worldwide distributed discussion system established in 1980—over a decade before the world wide web went online to the general public. The dataset comprised more than 500 million user comments spanning a period of 34 years.

The study analysis adopted the definition of 'toxicity' provided by state-of-the-art classifier software, which considers toxicity as "a rude, disrespectful or unreasonable comment likely to make someone leave a discussion."

The core finding of the study indicates a complex interaction between harmful content and participation in online debates. It suggests user resilience to negativity in digital environments and should inform policymakers' understanding of those environments and consequent decision-making.

Despite the evolution of [social media platforms](#) and changing social norms over three decades, the study findings represent a significant consistency in user interaction dynamics based on a constant human component.

Professor Walter Quattrociocchi, Lead at the Center for Data Science and Complexity for Society at the Department of Computer Science, Sapienza University of Rome, said, "This research represents a significant advancement in understanding online [social dynamics](#) and how they are influenced by algorithms, moving beyond the focus on single platforms. The results underscore the broad implications of algorithmic influence on social interactions.

"The study highlights the crucial importance of [data science](#) in analyzing and interpreting online [human behavior](#), confirming that toxic behavior is a deeply ingrained aspect of digital interactions."

Co-author of the study, Andrea Baronchelli, Professor of Complexity Science at City, University of London, Token Economy theme lead at The Alan Turing Institute, said, "Analyzing multiple platforms is key to isolating genuinely human behavioral patterns from simple reactions to the idiosyncratic online environments. The attention is too often focused

on the specific platform, forgetting human nature. Our study is an important step to change this attitude and move the spotlight back on who we are and how we act."

More information: Walter Quattrociocchi, Persistent interaction patterns across social media platforms and over time, *Nature* (2024).

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