Learning from Viral Content

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In recent years, viral content on social media platforms has become a major source of news and information for many people. Which stories go viral is jointly determined by the algorithms generating platform news feeds and users' actions on the platforms. We study this process with an equilibrium model of users interacting with shared news stories, focusing on how the design of news feeds affects how users learn. In our model, rational users arrive sequentially, observe an original story (i.e., a private signal) and a sample of predecessors' stories in a news feed, and then decide which stories to share. The observed sample of stories depends on what predecessors share as well as the sampling algorithm generating news feeds.

Our main results are about the consequences for learning when this algorithm selects more viral (i.e., widely shared) stories. Showing users viral stories can increase information aggregation, as a particular story gives a user more information than the realization of a single signal. The popularity of this story also tells the user about the past sharing decisions of their predecessors, so the user can draw inferences about the many stories that these predecessors saw in their news feeds. But there is a trade-off: showing viral stories can also generate steady states where most shared stories are wrong. These misleading steady states self-perpetuate, as users who observe wrong stories develop wrong beliefs, and thus rationally continue to share them. This generates a social version of the confirmation bias: incorrect but initially popular stories spread widely and determine people's beliefs, even though they are contradicted by most of the information that arrives later. One might expect such feedback loops with naive agents, but we show they can arise even with rational agents trying to share accurate stories.

We also explore several more applied consequences of our main results. First, we show platforms are more conducive to misleading steady states when users consume and interact with an excessive amount of social information, compared to the quality of private information they receive from other sources. Second, we ask when platforms are robust to malicious attackers who manipulate its content. Platforms that show less viral content are robust to such attacks, but platforms that show more viral content may be very sensitive to them.

The full paper can be found at: https://arxiv.org/abs/2210.01267

CCS Concepts: • **Networks** → **Social media networks**; • **Theory of computation** → **Social networks**.

Additional Key Words and Phrases: Social learning, selective equilibrium sharing, social media, platform design, endogenous virality

ACM Reference Format:
Krishna Dasaratha and Kevin He. 2024. Learning from Viral Content. In *Conference on Economics and Computation (EC '24), July 8–11, 2024, New Haven, CT, USA.* ACM, New York, NY, USA, 1 page. https://doi.org/10.1145/3670865.3673639

Acknowledgments

We gratefully acknowledge financial support from NSF Grants SES-2214950 and SES-2215256.

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EC '24, July 8–11, 2024, New Haven, CT, USA

ACM ISBN 979-8-4007-0704-9/24/07
https://doi.org/10.1145/3670865.3673639