

Media Competition Drives Complex Social Dynamics

A mathematical model suggests that social groups can behave in unexpected ways when subjected to competing mass media.

By **Ryan Wilkinson**

What is the impact of mass media on social systems? In the past few decades, researchers have tried to answer this question using mathematical models in which a media source is treated as a “field” acting on a social system represented as a network of interacting nodes. However, these models typically consider only one media source. Now Mario Cosenza at Yachay Tech University in Ecuador and his colleagues have developed a model that includes two or more competing sources [1]. The new model sheds light on the intricate dynamics of social systems exposed to conflicting messaging.

Cosenza and his colleagues began by considering two media sources, each influencing a social system uniformly but with a different level of influence. Using their model, the researchers found that this scenario had four possible outcomes: two expected and two surprising. The expected outcomes included a situation where most people were swayed by the more influential source and another situation where no clear majority emerged. The surprising outcomes included a case where most

people were persuaded by the less influential source and one where the majority did not align with either source. The exact outcome depended on various parameters, such as the difference between the levels of influence of the two sources, their combined level of influence, and the distance over which one person in the network could influence another.

Cosenza and his colleagues found that the two unexpected outcomes required long-range social interactions. The researchers also showed that these complex behaviors persisted when they extended their model to three competing sources. The team says that such behaviors should be observable in “experiments measuring media influence, product adoption, or marketing in social networks.”

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REFERENCES

1. O. Alvarez-Llamoza *et al.*, “Mass media competition and alternative ordering in social dynamics,” *Phys. Rev. E* **110**, 024311 (2024).



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