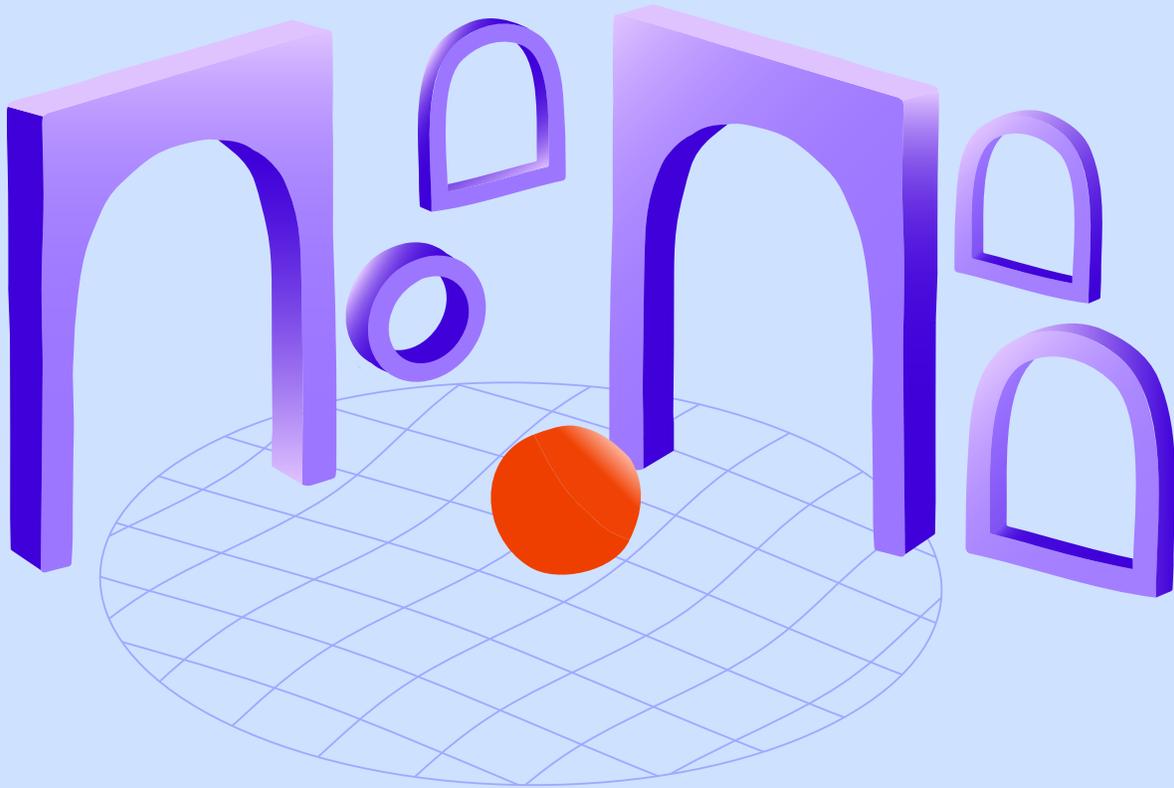


New_
Public

Dynamic Polycentrism



A Way to Measure Pluralism in Online Communities
without Excessive Surveillance

About this Report

This report was the result of a series of conversations led by Eli Pariser at New_ Public and Hahrie Han at the SNF Agora Institute at Johns Hopkins University, and supported generously by the New Pluralists project. Milan de Vries was the primary author of the completed text, but all of the participants below contributed meaningfully to the conversation. We are grateful for the opportunity to have worked with them.

About the SNF Agora Institute at Johns Hopkins University

The SNF Agora Institute at Johns Hopkins University is a multi-disciplinary academic center and public forum dedicated to improving and expanding civic engagement and informed, inclusive dialogue as the cornerstone of global democracy. The institute was founded in 2017 with a visionary \$150 million gift from the Stavros Niarchos Foundation.

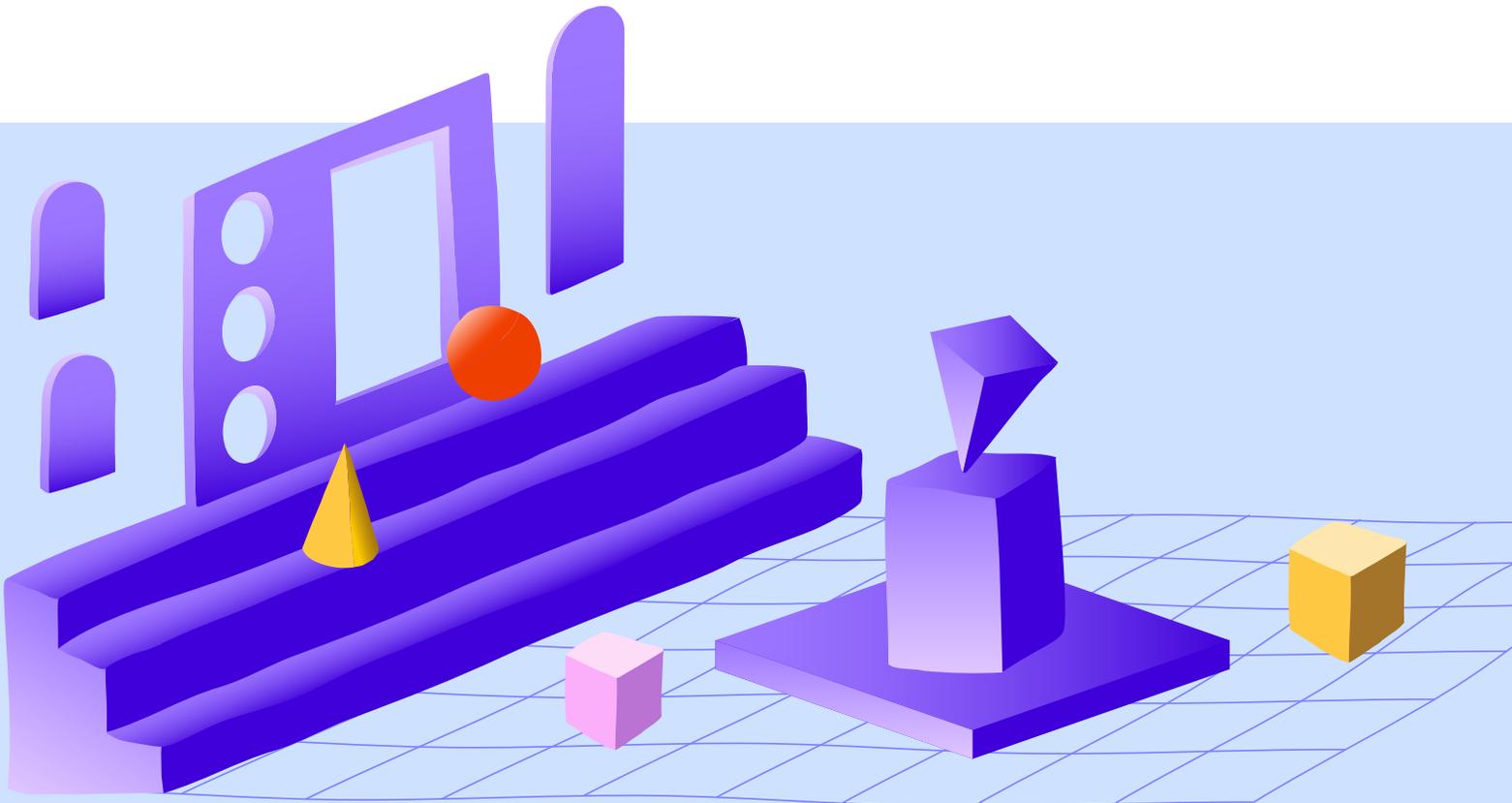


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01. Building community online

Over the last few decades, we have collectively embraced the web not just as a place of commerce and of information but as a place of convening. Yet, the communities we create online have no guarantee of being equitable, participatory, and pluralistic spaces. Instead, it is increasingly clear that shared digital spaces

extremist community through online networks. (Perry & DeDeo, 2021)

At New_Public we are keenly interested in uncovering the design principles of such healthy digital communities. Our Civic Signals work offers a framework for broadly assessing the health of an online community in four

“If we wish to build healthy digital spaces, builders need some measure of the quality or strength of those interactions.”

can be used to foster pluralism or to further single-group dominance and authoritarianism. For example, recent scholarly examination of the sexist “Red Pill” ideology has highlighted the dynamics of how newcomers are recruited, and subsequently become embedded, in this

categories (Welcome, Connect, Understand, and Act) and 14 areas. Here we extend that work to consider the pluralism of the space itself, building on a series of discussions with scholars from the SNF Agora Institute at Johns Hopkins University.

02. Focusing on pluralism for *public* spaces

Pluralism is an important fundamental characteristic of healthy public spaces. Public spaces enable community both directly through the resources and services they provide (recreation space, books, information) and indirectly by providing vital connection points between community members. In that capacity, public spaces are instrumental to developing a community's cohesion, trust, and ability to make collective decisions. For public spaces to effectively fulfill both their direct function and indirect connecting function, it is imperative they be used by and foster interaction between a diverse representation of the community.

The hallmark of digital communities, differentiated from transactional or informational websites, is that online communities involve such interactions between participants. These interactions define a network, with myriad factors that could characterize a healthy network. Healthy communities might involve robust participation, or positive interactions, or effective

collective decision-making. None of these, however, distinguish between a community moving towards increasing inclusivity and integration and one tending towards narrowness and polarization. Knowing this requires a dynamic measure not only of the community as it stands or as it was conceived, but also of how a network is evolving. A community may begin as ideologically neutral or broadly inclusive, but become dominated by a narrow set of identities or perspectives.

For this reason, we focused our attention on understanding the ability of networks to sustain difference without domination and, specifically, on measuring pluralism dynamically within a digital space.

A key early question we sought to understand was whether pluralism in a network was a function of the individuals in the network, of dyadic interactions between those members, or of the network itself.

03. Pluralism and individuals

On the face of it, it would be easy to describe the degree of pluralism of a network as a function of the diversity of its individual members. This reasoning, though, quickly runs into three limitations.

First, *to adequately measure the pluralism of a network based on individual members, it would be necessary to describe the characteristics of each individual that contribute to diversity.* This is both theoretically and practically challenging. People have many aspects to their identity. Is a community pluralistic if it is racially diverse but economically narrow?

Second, measuring pluralism this way would also *require a platform to gain a lot of knowledge about the identities of a platform's users* to be able to implement the measure.

And third, *measuring pluralism based on who is present fails to account for how that community is functioning.* It is possible that a community has diverse membership but that only some identities communicate with each other, or that power is still structured by identity.

An alternative is to consider the interactions between pairs of network members over time. This modification, however, does little to alleviate the challenges of defining pluralism through individuals. It is still the case that an online platform would need to collect a lot of personal information about the individuals to assess whether the interactions contribute to pluralism or not. It is also the case that a network that exhibits some interactions across difference alongside otherwise entrenched, non-pluralistic interactions can hardly be considered entirely pluralistic.

04. The case for dynamic polycentrism

Our search for an appropriate measure of pluralism turned instead to the concept of polycentrism. Polycentrism has been

described by Elinor Ostrom and others as a system of governance in which significant collective decisions are made by different

smaller decision-making groups within the community. The notion of polycentrism didn't originate in political science (it came from botany) nor is its use limited to discussions of governance. The idea of polycentrism is frequently used in urban planning, geography, and other fields. (Stephan, Marshall, McGinnes. 2019) So while a digital platform may not involve collective decision-making, the core idea of having multiple centers of activity that add up to a larger whole may still apply. Specifically, both healthy, participatory digital spaces and democratic, pluralistic governing systems successfully operate across difference. Neither seeks to eradicate difference. Instead, they aim to create structures and mechanisms that allow power-sharing—in participation or in decision-making—in the face of such difference. Polycentrism is therefore a hallmark of systems in which difference still exists, but power is equitably shared.

Polycentricity as a measure of pluralism has a number of appealing features. A polycentrism measure would judge an extremist digital community like the Reddit “Red Pill” community, in which discussion is dominated by one, narrow ideological track, as non-pluralistic even if dissenting views were present but silent. Polycentrism would also judge

a platform that sustains multiple groups that never interact (for instance because they engage in very different, non-overlapping realms of discussion) to be non-pluralistic, for while they have multiple centers, those centers fail to add up to a larger whole. Importantly, *polycentrism is also a measurable characteristic of a network, regardless of the state of the network.* This mattered to us because it suggested an answer to another key question we faced—is pluralism measurable in a community at all times or is it evident only when the network faces decision making challenges or resource constraints. In other words, does the true pluralism of a network emerge only when the community is stressed, or is it measurable at all times. While certainly pluralism matters most in a community at times of duress, having a measure that is limited to then would be of little use in trying to design communities that might be more resilient to those stressors in the future. Polycentrism is evident in a network at all times, and changes in polycentricity can be measured over time.

In fact, it is this ability to assess and re-evaluate polycentrism over time that is one of the most appealing features of this approach. No public space is imbued with a guarantee of healthy, pluralistic

interactions at the outset. The design of the space may create conditions that enable pluralism, but realizing such outcomes depends on the development of the network over time. Measuring polycentrism over time makes it possible to track whether a community is evolving towards or away from pluralism. Moreover, for those interested in designing public spaces that lend themselves towards pluralism, this dynamic nature of polycentrism is critical. A space that maintains pluralism requires that the interactions of the community—the topology of the network being measured—change and adapt as the community develops

and faces challenges. Without this dynamic ability, a network will tend to foster homogeneity and reinforce enclaves. Our approach to dynamic polycentrism allows those changes to be measured. Moreover, it makes it possible to evaluate the impact of design interventions aimed at increasing the pluralistic character of the space over time.

05. Applying polycentrism to digital communities

While conceptually appealing, polycentrism—or indeed dynamic polycentrism, if considered as a measure over time—is only useful if it can readily be applied to any digital network, regardless of the exact feature set or implementation of such a network.

As a proof of concept of a polycentric measure, we considered the following minimal aspects on an online platform: The platform

should have multiple users who interact with the platform repeatedly over time. The users should interact with different content over time (generically with different “posts”) which can be created either by central administrators or the users themselves. And there should be some way in which the interaction of users with content is measured (possibly “comments” but could also be “likes” or even just views.)

With those constraints in mind, we consider an interaction in the community's network to be any time when two users interact with the same comment. This shared interaction defines an edge between those two user nodes in the network.

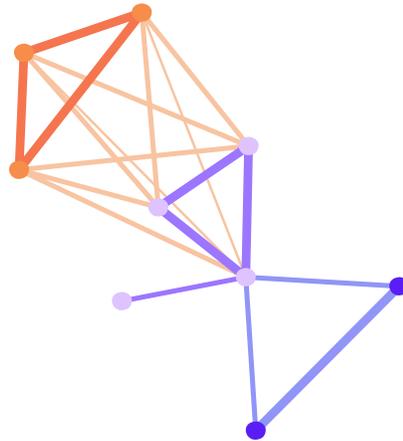
When the same users again interact with shared content in the future, the weight of that node increases. This, then, defines a translation of a table of user interactions with content into a network of shared interests and discussions.

For instance, if we simulate the content interactions of 9 users who each have pre-defined preferences for posts on 5 different topics over 200 posts, we might end up with a table, a sample of which looks like this:

	Post	Topic	User	Comment
1	1	1	3	1
2	52	3	8	0
3	56	6	3	0
4	88	2	1	1
5	110	1	8	0
6	119	5	4	0
7	133	5	7	0
8	134	5	9	1
9	150	5	8	1
10	172	3	9	0

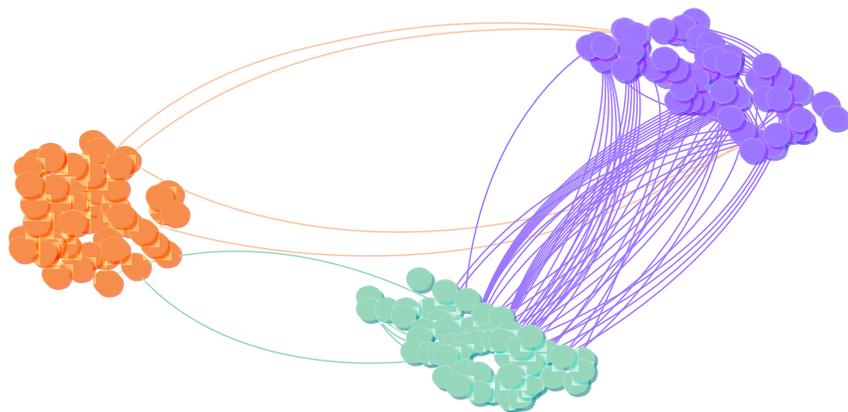
... with 1,340 more rows

Using our proposed heuristic, that table of interactions would translate to a network that looks like this:



Importantly, the table of user actions contained no information about possible sub-communities and the algorithm used to generate the network used no information about the topics of the posts. Instead, this approach reveals multiple (color-coded) centers within the community, as well as the links or bridges between them.

Applying this approach to a larger, simulated network makes the potential measurement value even more evident. In the digital platform simulated below, featuring 200 users, the data derived only from the interactions of users with content generates a network that has three distinct communities. Two of these (blue and green) have extensive bridges between them, while the third (red) appears to operate largely without connection to the larger community.

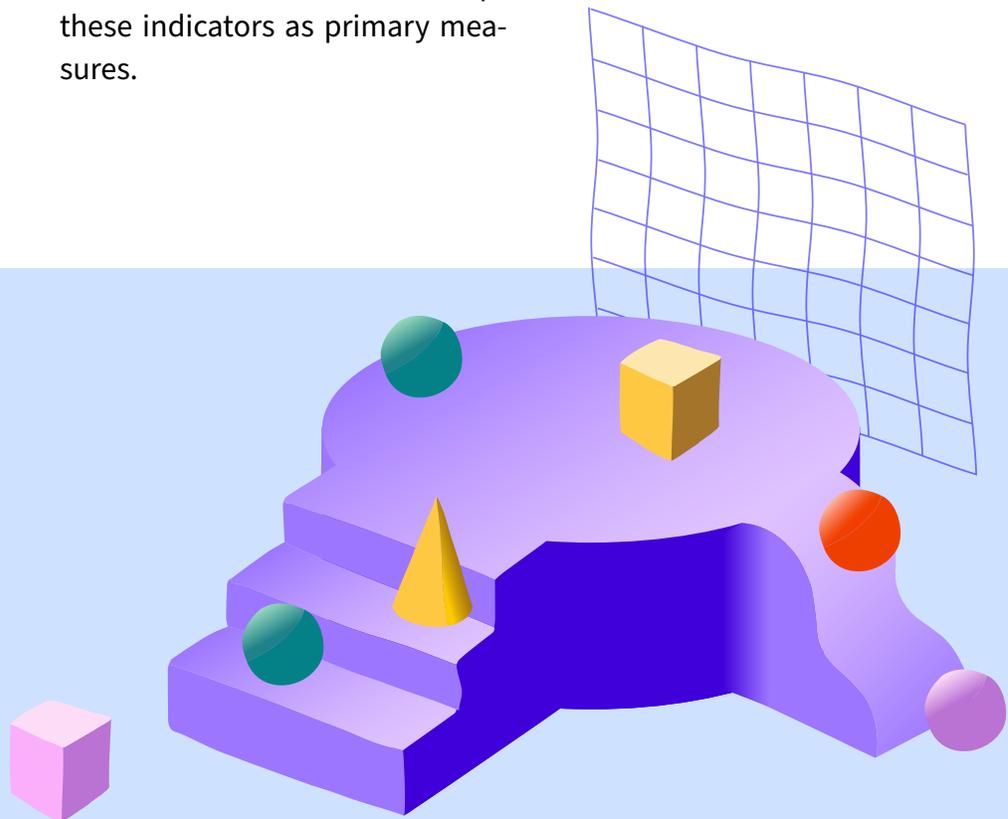


06. The potential of dynamic polycentric measures

Our approach to polycentric measurement is intended to reveal the ability of an online community to sustain multiple, diverse, but linked groups of members over time. This is a critical indicator of pluralism within such a space. To be clear, this is not an indicator of whether the interactions within such a network are free of contention. It would be possible in many digital platforms to use additional information about the valence of comments or about reactions to posts to assess the degree of agreement or cooperation within a network. Our preference, however, is not to adopt these indicators as primary measures.

A well-functioning pluralist space need not be without contention and, indeed, a contention-free space need not be pluralist.

In seeking to design and measure robust pluralist spaces online, we aim not to erase or obscure difference, but to create communities in which such differences can persist while also contributing to a greater whole. *We offer our proposed dynamic polycentric measure as a new tool in designing and evaluating such spaces.*



Special Thanks To ...

Stephen Ruckman

Stephen Ruckman is the managing director for SNF Agora, where he works closely with the director and team to advance the institute's research and teaching missions and support delivery of all institute activities. Prior to joining the institute, he worked as a policy attorney in federal and state government, and also served as JHU's senior adviser to the president for policy. Stephen holds a J.D. from Yale Law school, a M.A.R. in Ethics from Yale Divinity School, and a M. Sc in Philosophy, Policy and Social Value from the London School of Economics.

Talia Stroud

Natalie (Talia) Stroud is one of the academic co-leads of a collaboration between Meta and the academic community to assess the effects of Facebook and Instagram in the 2020 U.S. presidential election. She also is collaborating on project to re-envision public life on platforms through New_Public.

Talia's research on the media's role in a democracy has received numerous national and international awards, including the International Communication Association (ICA)'s prestigious Outstanding Book Award for her book *Niche News: The Politics of News Choice*, the inaugural Public Engagement Award from the Journalism Studies Division of the ICA.

Divya Siddarth

Divya Siddarth does research and applications in the space of democratized technology, decentralized governance, and online and offline collective participative processes. Her current focus is around promoting and preserving the digital commons, building the technology and policy infrastructure for data collaboratives, and devising frameworks for collectively-focused.

Hahrie Han

Hahrie Han is the Inaugural Director of the SNF Agora Institute, the Stavros Niarchos Foundation, Professor of Political Science, and Faculty Director of the P3 Research Lab at Johns Hopkins University.

Hahrie is an award-winning author of four books and numerous articles published in leading scholarly outlets including the *American Political Science Review*, the *American Sociological Review*, the *Journal of the American Medical Association (JAMA)*, and elsewhere. She has also written for outlets like the *New York Times*, the *Washington Post*, and others. She is an elected member of the American Academy of Arts and Sciences and was named a 2022 Social Innovation Thought Leader of the Year by the World Economic Forum's Schwab Foundation. She is currently working on a fifth book, to be published with Knopf (an imprint of Penguin Random House), about faith and race in America, with a particular focus on evangelical megachurches.



Milan de Vries

Milan de Vries is an associate research scholar at the SNF Agora Institute and former director of analytics at MoveOn.org, where he revolutionized the use of data to advance grassroots organizing and influence civic behavior. De Vries holds a PhD in biology from MIT, where he witnessed the bioinformatics revolution and developed skills to transfer those insights to civic data.

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Peter Pomerantsev is a Senior Fellow at the SNF Agora Institute at John Hopkins University where he co-directs the Arena Initiative. His book on Russian propaganda, *Nothing is True and Everything is Possible*, won the 2016 Royal Society of Literature Ondaatje Prize and was nominated for the Samuel Johnson, Guardian First Book, Pushkin House and Gordon Burns Prizes.

Jae Yeon Kim

Jae Yeon Kim is a research fellow at the SNF Agora Institute and P3 Lab at Johns Hopkins University. He also is involved in the Mapping Modern Agora Project at the SNF Agora Institute, which uses data and machine learning to map the US civil society at scale.

Kim is currently a Senior Data Scientist at Code for America and received his Ph.D. in political science from UC Berkeley in 2021. His dissertation received the Best Dissertation Award in Urban and Local Politics from American Political Science Association in 2022