Network Analysis on Indian Journalist Engagement on Twitter

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I. Research Question

In the present multi-media information milieu, social networks such as Twitter provide an intersection of a variety of information sources,. Journalists have not only emerged as among the more popular users on the platform, but also frequently well-connected to other social elites such as politicians, movie stars and others on the platform. How then do sources of information such as journalists shape how information networks develop online?

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II. Background

India, where journalism is going through a pivotal moment, provides an important testbed for questions on social media bubbles. There has been an unprecedented exchange of favor and candor between the biggest media houses and the current government, whereas reporters on the ground are facing persecution under colonial era laws at the hands of government agencies.

The media in India remain free, *technically speaking*, in the absence of any overarching laws or policy that seek to gag reporting in any way. At the same time, big businesses, often those favored by the current government, now control large swathes of the national media, pushing many to vocalize themselves on platforms like Twitter.

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III. Data and Methods

To examine the above questions, we used the publicly available list of "highly networked [Indian] individuals", "DISMISS" (Arya et al., 2022). The database was collected by snowballing an initial seed list of accounts multiple times using a friends-of-friends approach. We create a novel dataset by collecting each of the 4099 journalists' Twitter followers in February and March 2020, generating a corpus of over 77 million unique journalist-follower relationships, with over 25 million unique users. In the present analysis, we only examine the interquartile range of journalists, resulting in 1987 nodes. This network was filtered based on several aspects for further analysis.

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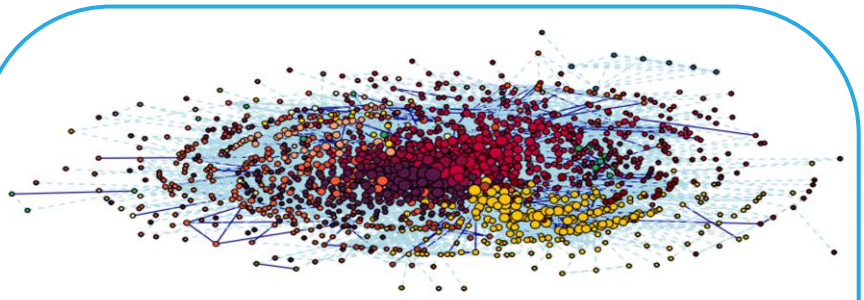
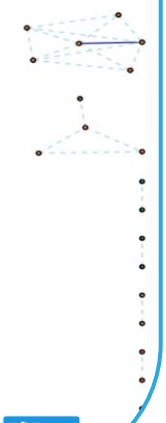
Journalist Networks



As a next step, we created network projections of two types from this bimodal data (journalists, followers); With journalists, where a node is connected to another, should they have at least one follower in common. The full journalist network pictured here has 1987 unique journalist nodes color coded into various clusters based on strength of edges between nodes. The visualization is only indicative of the network structure, showing only 2% of the total edges,

We filtered our full journalist network based on whether the journalists reported from the national capital (Delhi-National Capital Region or not), and if they mention any progressive ideals in their personal bios or not. This resulted in the 4 projections presented on the right.



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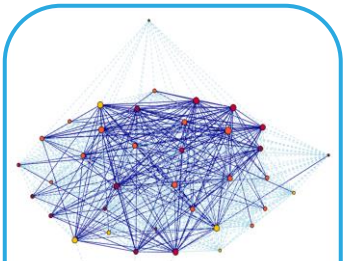

Journalists with "Social Justice" in Bio

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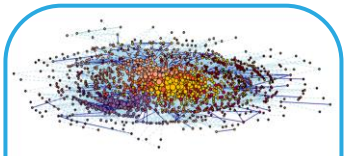

Journalists Without "Social Justice" Distinction in Bio

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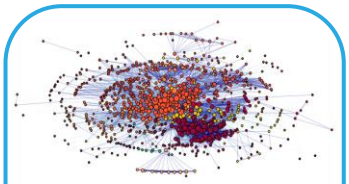

Delhi Journalists (Capital Media)

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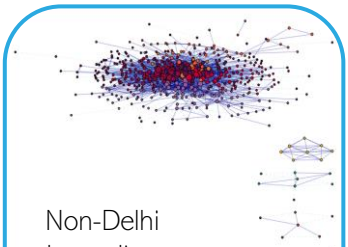

Non-Delhi Journalists

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	Full Network	Filtered Networks			
Categories		Non-Delhi	Delhi	"Social Justice" in Bio	No "Social Justice"
Nodes, Edges	1987,1.7 million	1183, 0.6 million	803, 280K	38, 640	1948, 1.6 million
Density	0.87	0.23	0.89	0.87	0.91
Clusters	8	11	4	8	3
Modularity	0.16	0.23	0.11	0.16	0.09

IV. Findings and Next Steps

Like many things on the web, we found that patterns of journalists' popularity also follows a power law distribution (Hindman, 2008) with some celebrity journalists disproportionately enjoying the privilege of visibility that network news provide, and the recommendation system exacerbates. We find that many journalists are very densely connected by way of sharing overlapping followers with other journalists, whereas very few are not connected with others at all. Going forward, we will capture how organizational affiliations shape information networks. We will examine the follower's projection network to ensure the robustness of our conclusions. As a final step, we will determine whether the networks tend to become insular through agent-based models.

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Summary

Given the pressures on predominant mainstream news media, several digitally native news platforms have also emerged which have been growing in popularity and power over the last several years which have attempted to challenge mainstream media by providing alternate platforms and modalities to more "traditional" forms of reporting. At the same time, several popular organizations also have an overtly partisan tone. In that case, it is worth examining how these contradictions shape how audiences engage with journalists online. Twitter has occupied an interesting space in that respect. Particularly, it acts as a site where organized propaganda (Dash et al., 2022) as well as public dissent are mobilized (Mishra et al., 2021). It is worth examining the role that journalists of different proclivities play in such contexts.

The number of followers of journalists in our dataset range between 103 to over 10 million. Given the size of this corpus and the incredible computation resources required to generate matrices that can be used to project the networks, especially with followers, we are presenting some early visualizations and descriptive analysis of the network of journalists here. The graphs found in this initial study are incredibly dense and can be hard to decipher from a cursory glance. In future, we aim to create more filtered networks and potentially work with signed networks in order to provide more clarity within our end results.

To understand how journalists share audiences and how information travels on Twitter, we use measures like network density, modularity and weighted degrees. More specifically, degrees signify how many nodes each node is connected with. The distribution of degrees clarifies at least some of our suspicions regarding fragmentation of journalists' networks. We see that many are very densely connected by way of sharing overlapping followers with other journalists, whereas some are not connected with others at all.

While the results for our primary full network of journalists was somewhat predictable (most journalists collected are connected through a good number of overlapping followers), our filtered matrices provided more interesting results. Journalists reporting from Delhi are highly connected with each other through shared followers, given that 89% of possible connections are realized. Journalists who do not mention their location or are not reporting from the capital have a much more disaggregated network with only 23% connections realized. Understandably, this network has a more pronounced community structure too, indicating the overall centrality of Delhi-based journalism in the information network on Twitter. Very few journalists mention progressive values (for example, gender justice, caste equity, etc.) in their bios, but those who do are weakly connected with most others within this category. Conversely, the network of journalists who do not mention progressive ideals in their bios is approximately the same as the network of all journalists.

Significance

Objectivity as a journalistic ritual, strategic or normative, is a near misnomer in many high-choice media contexts. Media and media persons are known to actively pursue partisan and polarized agendas (Arceneaux & Johnson, 2013). This has been rightfully identified as an issue given how it shrinks the space for "unbiased" information. Many studies have illustrated how individuals and audiences who consume this kind of media also seem to choose them based on their own personal and political dispositions. With social media, these concerns have only increased. On the one hand, this seems reasonable as individuals would like to maximize their experience with any type of content by choosing what they like and prefer (Stroud, 2008; Iyengar & Hahn, 2009). At the same time, individual choices and responses are reinforced through algorithmic sorting of news feeds, so fears surrounding rabbit holes, echo chambers and filter bubbles have significantly multiplied (Sunstein, 2001).

Thus, the questions our research study aims to answer are important in terms of understanding how pervasive this "bubble" problem is on social media. While our data is only restricted to a pool of Indian journalists for now, if meaningful patterns can be found within this sample, then it stands to reason that other information "elites" on the platform may also fall under similar trajectories. Furthermore, while India provides a unique testbed due to the country's current political hierarchy, these networks and the ways they are filtered are not created in a way that is exclusive to the region. Platforms such as Twitter provide a global reach for individuals, and so the scales of these networks can be much larger in scope than ever before.

References