Rethinking Audience Fragmentation Using a Theory of News Reading Publics: Online

India as a Case Study

(7926 words)

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Abstract

Scholarly work that seeks to theorize about fragmentation of media audiences has largely been restricted to the experiences of advanced democracies in the west. This has resulted in a preponderance of research endeavors that have sought to understand this phenomenon through ideas that are pertinent, perhaps solely to those contexts, and not as applicable outside, particularly in the Global South. This has potentially limited our imagination into various other ways in which audience fragmentation can manifest in these often-overlooked countries. In this paper, I use the case of online India as an example to offer a theoretical framework – that of news reading publics – for understanding audience fragmentation as a more global socio-political phenomenon that allows for rigorous comparative research, without being restrictive in scope. I draw from existing theories in communication and related disciplines and show how such a framework can be situated within existing social science theory. I argue that this framework should make us think of audience fragmentation in western contexts to be special cases of a more general model. I also show how network analysis can be used as a context-agnostic tool for identifying news reading publics and demonstrate the utility of such a method in complementing this theoretical framework. Finally, I discuss potential future research directions that this framework generates.

Keywords: news consumption, online news, uses and gratifications, issue publics, audience behavior, audience fragmentation, network analysis, India

Rethinking Audience Fragmentation Using a Theory of News Reading Publics: Online India as a Case Study

Ever since the irruption of cable television and the subsequent erosion of mass media audiences, communication scholars have theorized audience behavior using the dual lenses of audience fragmentation and audience duplication. Audience fragmentation describes “a situation where people increasingly use media they only share with small groups of like-minded individuals, and audience duplication a situation where the audience for individual outlets may seem small and circumscribed, but most people in practice use many different media, and many media are used by people of many different persuasions” (Fletcher & Nielsen, 2017, p. 476). These lines of research are largely motivated by prevailing concerns about a rapidly evolving media environment and its relationship with political processes worldwide. Many scholars have warned how a “high-choice” media environment can undermine the democratic ideal of a public sphere, by drawing audiences into informational siloes, thereby reducing the common ground needed for informed debate, deliberation, information exchange, and political engagement (Habermas, 1989; Pariser, 2011; Sunstein, 2017; Williams & Delli Carpini, 2011). An alternative line of inquiry has focused on audience fragmentation from a marketing and business perspective. These scholars and commentators describe the modern media environment as one that allows advertisers to profile individuals based on demographic attributes, inferred either directly or indirectly through digital surveillance techniques, creating specialized audiences for different products, thereby “segmenting” what was hitherto a “whole” national audience (Anderson, 2008; Turow, 1998, 2011). Moreover, these two lines of research have converged in recent years with the rise of political advertising in the context of news consumption on digital platforms.

Thinking of audience fragmentation along these lines has been instrumental in furthering our understanding of audience behavior in the contexts of advanced democracies like the US or the UK and this is evidenced in a multitude of studies that have sought to measure and assess the extent of audience fragmentation using several different techniques. However, the preponderance of these Western-centric perspectives in the literature has also limited scholarly imagination into other ways in which audience fragmentation may manifest in contexts outside of western democracies. This paper aims to broaden the scope of existing theories of audience fragmentation by contributing new comparative evidence that focuses on the case of India, the largest democracy in the world. In doing so, it adds to other lines of work that advocate for a more global perspective in communication research (Gunaratne, 2010; Iwabuchi, 2014; Kuo & Chew, 2009; Waisbord & Mellado, 2014) – to bring the discipline more in line with a “multipolar world” (Thussu, 2018). To that end, this paper uses novel evidence from India to inform and propose a theoretical framework, that builds on several existing frameworks for understanding news consumption and audience fragmentation and extends them to make them more globally applicable outside the western contexts in which they were conceived. The case of India is “not just intrinsically important, but also of broader relevance as an example of a market in the global South” (Majó-Vázquez et al., 2019), and theory building informed by empirical evidence from such a context is crucial if we are to generalize how we think of audience fragmentation today.

Audience Fragmentation and News Consumption

Like the process of news consumption itself, scholarly attempts that seek to understand it, have evolved, hand in hand with innovations in communication technology. These innovations have time and again, transformed media environments and changed the way people navigate

media landscapes (Baum & Kernell, 1999; Mitchelstein & Boczkowski, 2010; Stroud, 2008).

Yet, because technological innovations tend to originate in western democratic countries, efforts to build theories that account for these innovations tend to constrain themselves to the experiences of the same. This results in an over-abundance of western-centric perspectives in a field that otherwise has more global and diverse aspirations (Thussu, 2009; Waisbord & Mellado, 2014). India represents an interesting case study because it offers us an opportunity to identify and circumvent some of the limitations of existing theories that prevent us from understanding news consumption as a more global socio-political phenomenon. The notion of audience fragmentation lends itself particularly well to this exercise. This is because the normative use of the term presupposes a societal condition when large sections of a national citizenry shared a common media experience (Prior, 2007). This is true in the case of the west, where developed democracies like the US witnessed a relatively long and stable period of broadcast media, with the majority of the population tuned to one of the big three television networks (Prior, 2007; Williams & Delli Carpini, 2011). Therefore, when towards the end of the 20th century, cable television, and then later the internet, resulted in a multiplicity of options for the consumer, audiences have been said to “fragment” by distributing their attention selectively to only a few of the available options. Moreover, this fragmentation was largely understood to be happening along “cracks” or dimensions that were germane to the American socio-political context. One such dimension was provided by decades of research on partisan selective exposure (Sears & Freedman, 1967; Stroud, 2014; Zillman & Bryant, 1985), which viewed one’s partisan identity to be the prime determinant of their news seeking behavior. An alternate dimension was provided by scholars studying the advertising industry that segmented audiences demographically or generationally instead of along partisan lines (Turow, 1998; Zeithaml, 1985).

Such lines of thinking have since permeated audience research in the age of the internet, as is evidenced by a plethora of studies since the turn of the 21st century. Most of these studies aim to understand online news consumption through the lens of partisan identity and political polarization, not just in the United States (for egs. Allcott & Gentzkow, 2017; Barberá et al., 2015; Garrett & Stroud, 2014; Levendusky, 2013; Messing & Westwood, 2014; Peterson et al., 2019), but elsewhere as well (Cardenal et al., 2019; Chan & Lee, 2014; Del Vicario et al., 2017; Siegel et al., 2018; Tsftati & Chotiner, 2016).

These notions of a gradual turn to fragmentation simply do not apply in the case of a developing country, that never had a stable or long period in its history during which their population was united in their consumption of media products. Particularly in India, a country with over 20 official languages (See Table A1 in the Supplementary Information), where television penetration was yet to cross the 70% mark in 2018 (Laghate, 2018), and newspaper readership has historically been low owing to low literacy ratesⁱ, media audiences scarcely witnessed a shared media experience that unified them. Moreover, the presence of vernacular regional media industries in different parts of the country in different languages precluded any chance of a shared media experience in the first place. When India had only a couple of television channels (till the 1980s), few people in select cities had access to the television – this meager audience was fragmented by geography. Since then, as television has grown to be the most popular media format in the country, audiences remain fragmented, but by language. Thus, media audiences in India have always been fragmented to begin with, either owing to the lack of access to media products, or the linguistic divide, or both, and this has precluded any opportunity for the Indian citizenry to ever share a common media experience like citizens in more mature democracies.

Given the manner in which the developmental arc of the media environment in India differed from that in the west, traditional theories of fragmentation – that along partisan or demographic lines – are unable to paint a holistic picture of news consumption in India, or other non-western democracies for the matter. For truly global audience research, there is a need for a general framework for understanding news consumption as a global phenomenon that can scale beyond a single country, and that can be used to compare audience dynamics between countries. This paper is motivated by the need to refocus theories of media consumption and offer a framework that does not make such normative assumptions. In the next section, I introduce a plausible theoretical framework – a theory of news reading publics – that draws from existing theories in the communication and psychology literatures and synthesizes them in the context of news consumption. In subsequent sections, I describe how news reading publics can be theoretically situated at the intersection of these existing frameworks., by applying them to the context of online news seeking behavior in India. I further argue that such a framework should make us think of theories of news consumption in the US or any other western democracy *as special cases* of a more general model instead.

News Reading Publics

A news reading public can be defined to be a group of individuals who share substantial overlap in their news consumption patterns. The shared consumption patterns could reflect one or more attributes that unite them, either making them actively seek out or inadvertently exposing them to a common set of media products. A news reading public thus, can also be defined as a set of news (or more generally media) outlets that are consumed by certain groups of people who either seek specific gratifications, or automatically gravitate towards by virtue of shared societal experiences. These can exist in a variety of contexts and can theoretically be

found at all resolution levels of analysis, be it international, national, sub-national, and regional. Moreover, a news reading public is not a rigidly defined entity with clear boundaries, but rather, a loosely organized collective that is understood conceptually, often overlapping with other news reading publics. A certain individual may for instance, belong to the liberal news reading public in their own country (comprised of sections of the citizenry who consume similar news), as well as to a sports news reading public, comprised of individuals across the world that supports a certain sports team, or follow a certain sport. Similarly, a certain media outlet can also be shared by different news reading publics. The BBC for example, may attract certain people seeking news about the UK (primarily composed of people living in the UK), but also a large number of people globally who follow English soccer.

Conceptualizing news consumption in this manner aims to understand the organization of different audiences (each with a unique set of shared expectations and consumption patterns), and the resulting fragmentation, within a larger national context. The framework departs from existing approaches by not making any assumptions about what the dimensions of audience fragmentation are, instead, relying on the data to inform what those dimensions *could* be. Another example lies in the theory of selective exposure to partisan information, which has proven to be particularly useful for understanding news consumption in the United States. Most studies that seek to understand audience fragmentation in the US, assume a partisan divide in consumption patterns to begin with (see, for e.g., Iyengar & Hahn, 2009), before presenting evidence for or against fragmentation along this divide. In marketing research, similar approaches are applied to drive and understand demographic segmentation – and advertising audiences are typically thought of in these terms as well. The news reading publics framework

flips this idea on its head, by not imposing a preconceived model on the data, but instead, allowing the empirical evidence to inform and validate what such a model could be.

Seen in this light, selective exposure to partisan information or the demographic segmentation of advertising audiences in the US turn out to be special cases of this framework. Despite being empirically grounded in the context of a pluralistic and non-Western democracy like India, news reading publics offers a robust foundation to pursue comparative research – allowing us to identify the structural similarities and differences in the consumption landscapes between countries.

Unfortunately, the identification of news reading publics from behavioral trace data can be difficult. This is because, even though news reading publics may exist in almost all contexts, large scale news reading behavior usually entails randomness. In general, to identify news reading publics, at least one of two conditions must be met: first, there must be sufficient outlet specialization in the given media environment, with certain outlets appealing to specific and significantly large sections of the citizenry. Second, empirical data must be available at a sufficiently granular level. Most large-scale audience data are typically available at the outlet level, which makes the identification of these publics difficult owing to the lack of outlet specialization in most countries: a few mainstream media outlets are extremely popular, and therefore attract different kinds of news reading publics, whose individual existence gets obscured. This makes the case of India, a country with significantly high linguistic heterogeneity, particularly useful.

The Indian Context

One of the primary differences that sets the Indian media environment apart from its Western counterparts stems from the extent of the linguistic diversity in the country that creates a

media environment that is variegated and poly-centric (Chakravartty & Roy, 2013). There are 23 languages that are recognized as official by the constitution (See Table A1 in the Appendix), and while Hindi is spoken as a first language by over 40% of the population, it remains geographically restricted to the densely populated northern states, with scant penetration in the south (Ministry of Human Resource Development, n.d.). The different states, with their own native languages, have thriving regional media industries that publish and broadcast in their respective vernaculars.

The presence of regional media systems in parallel with the “national media” results in a very high degree of outlet specialization that is rarely seen in large democracies. This is because Indian citizens tend to identify with their state as well as their country, both culturally and politically. The cleavages that arise between the regional and the national are echoed in the power-dynamics between the regional media and the national media as well. Either set of media has to deal with overlapping but often distinct issues while managing very different consumer expectations. This points to a news consumption landscape that is potentially fragmented owing to the presence of *linguistically defined* news reading publics in the India citizenry, comprising people who share certain identities and interest in issues as well as positions in society with some others, but not with everyone.

As a first step towards the development of a new framework, one can therefore hypothesize that the average news consumer in India plays two “roles” – one, as a consumer of “regional” news, and the second, as a consumer of “national” news. Such behavior should be evident in the existence of multiple linguistic news reading publics in empirical data, with each such public corresponding to a different region in the country, sharing relatively small overlap with each other, but heavy overlap with a “national” public. This media experiences shared

within these news reading publics could be the manifestation either of shared underlying commonalities that make them seek out specific media, or a reflection of shared societal structures that they co-inhabit and the underlying social divisions that they navigate.

Situating News Reading Publics Theoretically

In this section, I describe how news reading publics can be situated within communication theory by drawing from several existing frameworks and applying them in the context of news consumption. It is imperative to note that these frameworks are certainly not the only theoretical approaches that can be used for understanding news reading publics but are among the most useful and widely applicable that are available in the literature.

Uses and Gratifications

Our first theoretical strand for understanding commonalities in news consumption comes from the uses and gratifications (UG) theory (Blumler & Katz, 1974; Katz et al., 1973). UGT is a user-centric approach to understanding why and how people actively seek out specific media content to satisfy individual needs. As opposed to asking what the “media does to people”, a UG approach focuses on asking “what do people do with media” (Katz, 1959). Since it was first proposed, the UG framework has seen extensive application for understanding media consumption patterns in several contexts around the world such as Hong Kong (Chan, 2015), Chile (Valenzuela et al., 2019), Australia (Rodrigues & Paradies, 2018), Nigeria (Saleeman, 2016), Greece and Turkey (Yanardağoglu, 2020), Spain (Cuesta-Cambra et al., 2021), and Malaysia (Freeman, 2013) among others. The framework also lends itself particularly well to the variegated media environment in a country like India’s because the linguistic differences in the different parts of the country create a nested media structure that is significantly determined by the linguistically selective media demand that exists in the various regions. It is for the same

reason that English newspapers are circulated throughout the length and breadth of India, but vernacular newspapers are not. The very first Hindi newspaper, for instance, was the *Udant Martand*, and it began publication in 1826 from Calcutta, the then capital of British India.

However, Calcutta, in West Bengal, being a Bengali speaking city in a Bengali-majority state, had a very small market for news in Hindi. Thus, the newspaper struggled to sustain itself and finally stopped publication the very next year (Free Press Journal, 2018).

In other words, if we use language as a marker for what makes connects people to news sources, the Indian media consumption landscape can be considered to be one that is shaped by a *linguistic familiarity* gratification. Moreover, because language reflects cultural and regional differences that run much deeper, one can expect this to be symptomatic of a more general gratification of familiarity: i.e. people seek out and consume news they are familiar with and block out news they are not. We can now hypothesize that Indian citizens consume national news and regional news because both these consumption activities satisfy these gratifications – a familiarity with the regional, and a familiarity with the national. It is important to note here that by focusing on uses and gratifications, the proposed theoretical framework, in no way, discounts the structural aspects of the news consumers' position in society. This is because familiarity, be it linguistic, or more deeply cultural, is largely the product of the meaning that news consumers assign to their position in society, and how they evaluate the media products that are available in their immediate environment.

Thinking about Indian news audiences using the UG framework thus helps us understand why regional media have thrived in the various parts of the country alongside English media that have operated at a national scale. It helps us to begin conceptualizing the duality of identity of Indian citizens as news consumers. These gratifications of familiarity (which translate into

parallel demands for regional media and national media in the country) thus reflects a complex dynamic of social identities that characterizes an individual Indian citizen. This allows me to segue into the second theoretical strand for understanding news reading publics.

Social Identity Theory

Social identity theory stems from the idea that “a social category (e.g., nationality, political affiliation, sports team) into which one falls, and to which one feels one belongs, provides a definition of who one is in terms of the defining characteristics of the category” (Hogg et al., 1995, p. 259).

In the context of news consumption, individuals indicate their different levels of salience for their different identities by seeking news and information about issues and topics that they deem relevant in their hierarchical conception of their selves (see, for eg. Georgiou, 2006; Storey, 1999). Self-conceptions are largely determined by the structural embeddedness of the individual in their social network. News consumption can thus be understood to be a behavioral manifestation of their role identities – that they fulfill by assigning meanings to their position in society. The higher one positions their identity in a particular role in society within their self, the more likely they are to seek information pertaining to that role. Studies have also demonstrated this by showing how people’s preference for media can be closely associated with their ethnolinguistic identity (Harwood & Vincze, 2015), racial identity (Schieferdecker, 2017), partisan identity (Wischnewski & Krämer, 2020), and national identity (Wojcieszak & Garrett, 2018). Social identity theory has been particularly useful for understanding media choice in minority populations such as Latinos in the United States (Salzman, 2014) and Syrian refugees in Canada (Mohamed & Bastug, 2020). Recent research has also demonstrated links between self-

identity and perception of the media people consume (Schulz et al., 2020) which in turn could influence their media consumption patterns

For many Indian citizens, who also strongly identify with their respective states by virtue of their cultural upbringing, it is easy to see why they would take on two roles as news consumers: the first being a consumer of regional news, and the second, being a consumer of national news. This existence of multiple news consuming roles, however, is not specific to India, even though it may be more prominent in India than in a country like the US. More generally, every individual in any society plays multiple news consuming roles (each corresponding to an identity). What makes the case of India useful is that these roles can be empirically identified, isolated, and analyzed from large scale news consumption patterns, owing to the high degree of outlet specialization – as I shall demonstrate in subsequent sections. This in turn crucially helps in complementing the framework with a robust set of methods and measures.

Issue Publics

The concept of issue publics provides yet another conceptual lens to understand how news audiences organize. First coined by Converse (1964), the term has come to mean groups of citizens who “who follow particular issues with close and relatively continuous attention” (Price et al., 2006). Like any “public” defined in the sociological sense, it does not refer to any specific geopolitical entity; instead it is used to define a loosely organized collective, formed out of a shared interest in issues (Price, 1992). While limited in its application to non-American contexts (an exception being Melki & Kozman, 2020), the concept of issue publics has been used to understand how interest in certain topics makes news seekers overcome selective exposure along partisan lines (Brenes Peralta et al., 2017; Iyengar et al., 2008; Mummolo, 2016).

In the context of India, issue publics can be theorized to be split along the political divisions of the state boundaries, while also simultaneously existing at a national level. This also maps on to the dual identity of Indian citizens discussed earlier. Because the political system in India is characterized by a large number of regional parties that only operate within certain states, as well as national parties that operate throughout the country, political manifestos that parties run on for elections, and political issues that voters vote on, can be very distinct and diverse in different states. Moreover, the cultural differences between states also make various aspects of daily life very different. For example, different states celebrate different festivals and observe different holidays. These variations in political and cultural issues across the country give rise to regionally fragmented issue publics, who, during the process of news consumption, seek out news that is of specific relevance to them. It is again important to note here that issue publics are not solely the result of individual agency of the news consumers, but of the societal context they are embedded within – that allows them to assign meaning to certain issues and not to other issues. Different regional issue publics are also nested within a national issue public – because as citizens of India, people living in the various states of the country are structurally socialized to assign meaning to issues relevant to the country at large as well.

Cultural Proximity

Our final strand of theory for developing the framework of news reading publics comes from the cultural communication literature. The Indian media environment has historically been shaped by forces of media imperialism, and subsequent Indianizing pushbacks (Athique, 2012; Guha, 1997; Thussu, 1998, 2007). Cultural theorists argue that the mechanism underpinning these dynamics lies in an indigenous preference for cultural proximity that acts as a natural gatekeeper for foreign media in non-Western countries: “viewers tend to actively privilege

national or regional programming over its imported counterpart and in fact rarely turn to imported programs when local alternatives are available” (Chadha & Kavoori, 2000). In other words, when Western imperialistic powers (either nation states or corporations) enter new markets, they encounter local competition as the market saturates. At that point, audiences in these markets tend to automatically prefer to consume the locally produced content to the Western content because of their cultural proximity to the former (de Sola Pool, 1977). Other cultural effects studies (ones, for example, done in Saudi Arabia (Boyd & Najai, 1984), South Korea (Kang & Morgan, 1988), and the Philippines (Tan et al., 1987), have also found how “Western media differentially affected foreign audiences” (Salwen, 1991). More recent research has shown how cultural proximity is an important determinant of news consumption among minority populations in foreign countries (Mohamed & Bastug, 2020; Salzman, 2014). Moreover, there is also many instances of foreign media outlets adopting transnational content production strategies to engage local audiences with “culturally proximal” news (Chyi et al., 2019).

In the context of India, a preference for cultural proximity is reflected in the division of consumption patterns between English media and vernacular media. As Rajagopal (2004) opines, English has been the language of the elite, that has always excluded the vernacular speaking masses since independence from British rule, continuing a “colonial practice of aloofness and unfamiliarity with local traditions”. For the swathes of Indians living in rural areas, English media, despite being “national”, are too unfamiliar, when compared to the more “culturally proximal” vernacular media products. This points to the existence of theoretically distinct news reading publics – defined in terms of cultural familiarity and language, which in turn are yet again determined by the structural organization of Indian society.

The proposed framework of news reading publics thus, recognizes that uses and gratifications, social identity, interest in issues, and cultural proximity all represent the many complex ways in which the agency of the Indian news consumer interacts with their structural embeddedness in society. The theoretical angles presented here are therefore *structurationist* in nature (Giddens, 1984), that neither privilege agency nor structure in helping us understand news consumption. Moreover, while these theoretical considerations only provide *plausible* explanations for how news reading publics can form, it is imperative to note that they correlate heavily with each other. A person can therefore consume certain media products not just because they are interested in certain issues, or because they subscribe to a certain social identity, but also because they are culturally limited to consuming products in languages they are familiar with, or all of these. It is important to note here, that these four theoretical approaches are only four of a larger number of factors that determine how national audiences form. Other factors, both individual, such as trust and ideological alignment, as well as socio-structural, such as social endorsement and popularity, also guide news seeking behaviors. These could in turn also influence the creation of news reading publics that look very different to those formed along ethno-linguistic lines, as hypothesized. However, in the absence of data that can help operationalize these variables, I use language as the most easily identifiable attribute that unites media outlets with specific audiences in the country. Linguistic familiarity is, therefore, not only a big predictor of what news an individual consumes, but also a reflection of how cultural proximity, social identity, and shared interest in issues shape consumption behavior. This paper does not attempt to test nor tease apart the causal effects of these socio-cultural attributes on the overall structure of the news consumption landscape. Instead, it seeks to describe the large-scale

patterns of news consumption, to see if the structure of audience behavior that emerges, is in line with what we would expect if these theoretical considerations were valid.

Identifying News Reading Publics in India from Observational Data

In this section, I describe an analytical technique for identifying news reading publics from web-browsing data. The subsequent sections describe the results of applying this technique to the context of India. The news reading publics here, thus relate specifically to the online Indian population, which, despite being a relatively small portion of the Indian citizenry (34% as of 2017 (Statista, 2017)) , is the second largest online population in the world, after China's. In fact, in absolute numbers, the online population of India (around 450 million as of 2017) is larger than the entire population of the United States. From the perspective of political communication research, an online population of that large a size can certainly impact the political process. If news consumption patterns do associate with attitudes and behaviors (and there is enough evidence in the literature to suggest that it does), then understanding the manner in which 462 million people consume online news is certainly very important as well – especially for shedding light on an understudied, yet rapidly digitizing society like that of India's. I explore the limitations regarding the generalizability of findings from an online-only panel in the Discussion section.

Data

I used a dataset obtained from ComScoreⁱⁱ that tracks the desktop browsing behavior of a panel of more than 50,000 online Indian users over a period of 45 months, from October 2014 to June 2018. This dataset offers two statistics that allow me to measure exposure and co-exposure: the audience reach, and the cross-visits. The former is the number of unique individuals that visit a particular website, while the latter is the number of unique individuals that visits *every pair* of

outlets. Thus, while audience reach for website A for the month of December 2017 can tell us how many unique individuals visited website A in December 2017, the cross-visiting estimate for websites A and B can tell us how many unique individuals visited *both* websites A and B in December 2017.

Audience Overlap Networks

Using the cross-visits data, I built co-exposure or audience overlap networks for each of the 45 months in the dataset (see Figure 1). The nodes in these audience overlap networks are news domains (outlets), and the ties connecting each pair captures the number of unique users who visited that pair of outlets in that month. I then follow prior studies in controlling for statistical noise and eliminating non-significant edges from the network (Mukerjee et al., 2018). Similar methodology has been used in past research, both with ComScore cross-visiting data (Mukerjee et al., 2018; Taneja & Webster, 2016) as well as Facebook (Schmidt et al., 2017) and Twitter data (Grinberg et al., 2019). The monthly networks are therefore undirected and weighted, with the weight of edges between nodes capturing the strength of the monthly audience overlap between them. I then construct the aggregate network, by only keeping the nodes that occur every monthⁱⁱⁱ, and calculating the edge weights as the average of the corresponding weights for all 45 months.

Figure 1 The construction of audience networks (adapted from Mukerjee et al., 2018).

This yields an aggregate network with 174 nodes, each of which was classified manually along three dimensions, based on information provided on their websites: regional or national, Indian or foreign, and whether it is published in English or in a vernacular (or both) (See Table 1). As is evident from the tables, there are substantially more national outlets, more Indian outlets, and more English outlets in the dataset.

Table 1 *Breakdown of the 174 outlets that appear in every month in the data*

A		B		C	
National	118	Indian	109	English	125
Regional	56	Foreign	65	Vernacular	45
Total	174	Total	174	Both	4
				Total	174

News Reading Publics and Network Communities

A news reading public is a theoretical group of news consumers who share some commonalities in gratifications, expectations, and/or identities while reading news. These commonalities translate into them consuming news from a set of news sources that reflect not

just their own agency but also the ways in which they are constrained by cultural experiences and technological affordances in seeking out news. In the context of India, I have described how these commonalities and differences manifest themselves primarily along linguistic lines. Language, then, owing to its geographic distribution in the country, serves not just as a proxy for people's social identities, but also for regionalism. People consume media in their own vernacular either because the regional issues that they care about are reported in their own vernacular media, or more trivially, because their vernacular is the one language they are most familiar with. Because the presence of every news reading public would be manifested in a set of news outlets specific to that news reading public, one would expect the audience network to show evidence of clustering – with news outlets corresponding to a single news reading public to be more tightly connected to each other, than to outlets corresponding to other news reading publics. Such groups of tightly clustered nodes in a network are known as communities. Communities, if identified in the network, would imply the presence of certain outlets sharing significantly higher audience overlap than two outlets selected at random. Thus, in order to identify the various news reading publics, I analyze the aggregated audience overlap network using a technique known as *community detection* (Fortunato, 2009). Various community detection algorithms exist, but I use WalkTrap (Pons & Latapy, 2006) as it performs the best on the audience overlap network (see Supplementary Information for methodological details). Note that these communities – the set of media outlets that cluster together – are not the news reading publics themselves. However, the presence of news reading publics is reflected in these clustered communities. While this distinction is important, I use “communities” as a proxy for news reading publics in subsequent sections for TODO.

The WalkTrap algorithm should, in theory, be able to find both; communities in the network that represent various distinct vernacular media outlets in India – reflecting the prominent regional news reading publics; and communities that represent the national media – reflecting any national news reading publics. Moreover, there could potentially be other communities that reflect other news reading publics beyond just the national and regional ones: for instance, international news consumers – a very specific demographic of the Indian middle class – that constitutes a substantial part of the online public in India.

The Community Structure of the Audience Overlap Network

The findings (Figure 2) from WalkTrap reveal a distinctive community structure within the network, with the nodes partitioned into six communities (A to F).

Figure 2 Network of communities obtained by running WalkTrap on the network.

Four of these communities (Communities C through F) are linguistically homogeneous. C for instance, has only Tamil language outlets; D and E, only Malayalam language outlets. Similarly, F has only Telugu language outlets. The three aforementioned languages are all South Indian languages, which points to the linguistic fragmentation being particularly stark in the south, specially *within* the Keralite news reading public. This is in contrast to the northern states, where Hindi dominates. This is represented by one community (A) that remains linguistically heterogeneous, comprising of Hindi, English, and other North Indian languages. This community in essence, contains all the mainstream media outlets in the country – such as the national English media that are popular across the length and breadth of India, as well as the Hindi outlets that are popular in the northern Hindi speaking states. The last community (B) contains only international outlets and a few digital-born Indian ones in the English language.

Simulation Analysis

Given the set of outlets in the network, to what extent does the community detection algorithm reveal a statistically significant community structure, in line with the expectation of ethnolinguistic fragmentation? To answer this question, I use a measure of average linguistic homogeneity (H_C), as defined in equation 1, to characterize the “goodness” of the resulting community structure C along linguistic lines.

$$H_C = \sum_{c \in C} \frac{\sum_{l \in L} \frac{|o_{lc}|}{|o_c|}}{|C|} \quad (1)$$

In this equation, o_c is the set of all outlets in community c , o_{lc} is the set of outlets in language l in community c , and L is the set of all languages represented in the data. A “perfect” community structure would be one where outlets of each language are sorted into their own

community; as a result, in this ideal case, the inner summation $\sum_{l \in L} \frac{|o_{lc}|}{|o_c|}$ would be 1 for each community c , and the average linguistic homogeneity H_C would be 1 as well. Thus, if H_C for the audience overlap network is significantly closer to 1, than the corresponding H_C of a comparable but randomly rewired network, it would provide evidence in support of the hypothesis that the online news consumption landscape is indeed segregated along linguistic lines, that audiences in India demonstrate significant selectivity in preferentially visiting online news websites based on language.

Figure 3 shows the results of a simulation analysis. WalkTrap on the aggregated network yields a community structure with a statistically significant $H_C = 0.709$ (one-sided $p < 0.05$).

Figure 3 Results of the simulation analysis

This analysis demonstrates how community detection can help us complement the proposed theoretical framework by allowing us to identify meaningful shared commonalities in audiences in an unsupervised manner.

Discussion

Conceptualizing news consumption through the lens of news reading publics offers one key advantage: the methods used to identify them are agnostic to the context in which they are applied, and therefore do not require prior knowledge of the underlying cleavages of the context in order to be useful. Instead, it allows the researcher to query the evidence and observe which commonalities are the most salient in a certain context. Of course, knowledge of the context is then needed to interpret these commonalities, but as a first step, the identification of news reading publics, allows us to compare and contrast the extent to which these similarities govern the consumption landscapes in different countries at different points in time. Even if we only focus on languages as proxy for different news reading publics, we can use the framework described in this paper to inform our expectations of how the consumption landscape can look like elsewhere in the world.

According to a 2009 World Report by the UNESCO^{iv}, India ranks 9th in the world in linguistic diversity with a Linguistic Diversity Index of 0.930. The United States, by contrast, ranks 116th with an LDI of 0.353. Other major western democracies rank even lower, with France (LDI: 0.272), Germany (LDI: 0.189), and the UK (LDI: 0.139), 128th, 139th, and 155th respectively. If we think of linguistic heterogeneity to be a continuum, with India at one end, and the US at the other, then we can begin to understand how news consumption patterns can look like in democracies that lie along the spectrum. Spain (LDI: 0.438), for instance, has five different languages, three of which (Spanish (Castilian), Catalan, and Galician) are spoken by

significantly large numbers of people in some capacity^v (74%, 17%, and 7% respectively).

Knowing how the audience overlap network looks like in the case of India, we can expect a similar community structure (albeit to a lesser extent) to emerge in the case of Spain. By using evidence from multiple different contexts, we can contribute towards making this framework richer, thereby shedding light on the degree to which national audiences are characterized by different kinds of news reading publics organized along different dimensions. More importantly, it also allows us to confirm or refute our prior expectations about news consumption in a certain context. For instance, if the method yields a partition that is *not* in-line with prior theory, then it would require us to rethink how we understand news consumption in that context. This would certainly not be unprecedented, given how empirical evidence in recent years has demonstrated that partisan echo-chambers (conceptually identical to *partisan news reading publics*) in the United States are virtually non-existent (Guess et al., 2018), despite much speculation regarding their deleterious effects in the past (Sunstein, 2017).

The news reading publics framework, therefore, is not constrained to India. . However, the case of India is useful for developing this framework because its ethnolinguistic diversity creates a high degree of outlet specialization, that makes it easier to test the theory using behavioral data. The large number of languages in India allowed me to identify, operationalize and quantitatively define these news reading publics in a manner that few other countries would have allowed. With the US, the UK or any other country where audiences are more segregated along dimensions other than language, one would need more granular data to identify these publics, as there is no such clear attribute that unites the production and consumption of news – at least, at the media outlet level. As a result, news reading publics in these countries are typically thought of along ideological, regional, or demographic lines – leading them to being

interpreted in light of narrower, less universal theories. Network analytic techniques including community detection have already been used in the past to find evidence of polarization in news consumption patterns in the US and the UK (Del Vicario et al., 2017; Grinberg et al., 2019; Schmidt et al., 2017). The news reading publics framework offers a means to unite such approaches under a more general theoretical model. Even within India (or any other country for that matter), this theoretical approach leaves room for future research to try and tease apart the mechanisms behind the formation of observed news reading publics using survey or experimental techniques. Future research can also seek to investigate which of the many community detection algorithms works best in which contexts in successfully identifying interpretable news reading publics.

Finally, news reading publics can also be used to study longitudinal trends in the consumption landscapes, as well as to compare trends in consumption patterns between countries. How for instance, do news reading publics in different countries respond to politically salient events such as elections or referendums? Do certain publics become more or less prominent over time? Furthermore, what effect does the increasing prominence or gradual decline of certain publics mean for an audience? Do they predict voter turnout or vote share? Are there differences in how news reading publics evolve over time in less democratic countries than in more democratic countries? These are some avenues of comparative research that this theoretical framework opens and allows future scholars to address using a theoretically and methodologically sound framework.

There are two key limitations of this research. The first is that the dataset I use only captures desktop browsing activity, thereby ignoring the substantial penetration of mobile devices in rural India, where vernacular media are likely to be more popular than English

language media. The reason behind this is that ComScore did not track non-desktop users in India before 2017. Even after 2017, data from ComScore's Indian mobile panel was only available for a few months. While this is certainly a limitation that prevents us from getting a holistic picture of news consumption of online Indians, it is unlikely to undermine the core finding that Indian online news users are fragmented ethno-linguistically. This is because there is little evidence to suggest that vernacular users in rural areas actually consume news at all. A survey of over 6500 adults in rural Karnataka found that only half the respondents owned a mobile device, and fewer than 14% owned a phone with internet access (Vaijayanti, 2018). Moreover, of the subset of smartphone users in the survey, "the majority (85%) were unfamiliar with internet communication channels including email and Skype, while only 11% were familiar with Facebook, WhatsApp and YouTube, 4% with gaming, and less than 1% with online shopping". In other words, users in rural areas in India are less likely to have an internet-enabled phone, and if they do, then they are more likely to use their phones to access messaging, banking, and digital payment services, than for news consumption or web-browsing more generally.

The second limitation is that it remains to be seen if the findings reported in this study are generalizable to offline platforms like broadcast and print. Indeed, it is very likely that they are, because in the offline space, vernacular legacy media outlets have long dominated audiences' and readers' attention: only two of the ten most circulated newspapers in the country are in English^{vi}, and vernacular news channels on the television garner far larger audiences than their English counterparts (Broadcast Audience Research Council India, 2018). Thus, given the vernacular fragmentation in the country, and barely any overlap in terms of the number of speakers between any two vernacular languages, it follows that ethno-linguistic fragmentation in

offline news consumption would be far greater than online. Thus, while the exact extent of fragmentation between different media formats in the country remains to be compared, it is unlikely that the lack of data tracking the behavior of offline news consumers will undermine the fact that the news consumption landscape in India is linguistically fragmented. If there was no evidence of fragmentation in the online space, then it would indeed be a cause for concern. However, given that there is evidence of linguistic fragmentation online, it is plausible that similar dynamics will be further exacerbated offline. Indeed, the same methods described in this study can be used to appraise the level of fragmentation in those platforms, as and when rich behavioral data becomes available. Given the dearth of evidence of audience behavior in a democracy as large as India, the findings from this study, despite its data limitations, remain an important and timely contribution.

Data Availability Statement: The dataset used for this study is proprietary and not publicly available. It can be obtained from the corresponding author upon reasonable request.

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ⁱ The first census of independent India (1951) recorded India's literacy at 18%; the latest census (2011), at 74%.

ⁱⁱ Further details regarding ComScore's data collection methods are provided in the Appendix.

ⁱⁱⁱ Every node does not occur in every month as ComScore requires that a website registers a minimum threshold of traffic in a month for it to be included. I only keep those outlets that occur every month so as to not bias the aggregate estimates of the long tail of outlets that occur in some months, and not in others.

^{iv} See <http://www.unesco.org/new/en/culture/resources/report/the-unesco-world-report-on-cultural-diversity/>

^v See the World Factbook maintained by the CIA at <https://www.cia.gov/library/publications/the-worldfactbook/geos/sp.html>

^{vi} According to data provided by the Registrar of Newspapers in India (<http://rni.nic.in>) and the Indian Readership survey (<https://mruc.net/studies>).