

Awareness systems or echo chambers? Latin American journalists' usage of Twitter as a news gathering tool by Noah Amir Arjomand and Ali Ghazinejad

Abstract

Twitter holds the potential to help journalists — especially at independent news organizations in the Global South with limited resources — to diversify their news gathering beyond reliance on traditional gatekeepers. However, both Twitter’s design and journalists’ news gathering routines may be reinforcing, rather than breaking, media echo chambers. This study gauges how journalists in developing countries are using Twitter and whether new tools for interacting with the platform might help them access a greater diversity of online voices. To do so, we combine ethnographic observation of newsrooms in Mexico and Venezuela with a pilot test of a who-to-follow recommendation algorithm that seeks to expose Twitter users to new perspectives. We find that journalists’ strategies for using Twitter vary based on their organizational roles, the temporality of their work, and concerns about misinformation, but that some may indeed be receptive to alternative approaches to Twitter as an “awareness system” to generate news story ideas and identify sources.

Contents

[Introduction](#)

[Part 1: Case studies](#)

[Part 2: Rethinking Twitter’s “who to follow” \(WTF\) algorithm](#)

[Discussion: Toward diversified awareness systems?](#)

Introduction

Nearly a century ago, media critic Walter Lippmann argued that journalists inevitably depend upon institutions that collect and organize information. From this information, journalists develop a view of the world, find patterns and anomalies, and decide what will become news:

[T]he quality of the news about modern society is an index of its social organization. The better the institutions, the more all interests concerned are formally represented, the more issues are disentangled, the more objective criteria are introduced, the more perfectly an affair can be presented as news ... The press

is no substitute for institutions. It is like the beam of a searchlight that moves restlessly about, bringing one episode and then another out of darkness into vision. Men cannot do the work of the world by this light alone. [1]

The institutions Lippmann was talking about were statistics bureaus, universities, and other producers of dependable data, but we might now add social media platforms to the list of institutions on which journalists rely for access to information. By institutions, Lippmann meant organizations and networks that collected, processed, and verified information from which journalists could (whether openly or through leaks) produce news. Social media platforms like Twitter aggregate user-generated content and provide search and networking tools that organize that content for users according to their inferred interests. They have become institutions that organize the information from which journalists source news, both complementing and competing with those longer-standing institutions as intermediaries between newsmakers and the world on which they report.

Among platforms, Twitter is especially useful to journalists because of the platform's predominantly public nature: by default, tweets are by globally visible and no permission is needed to follow an account (Broersma and Graham, 2012; Bruno, 2011; Heinrich, 2012; Meraz and Papacharissi, 2013). Twitter has thus come to serve as an "awareness system," meaning a system that provides a user the means to monitor a real-time flow of information, with a great deal of information passing across the periphery of the user's awareness until the latter detects and foregrounds what is most relevant to them. Twitter alerts journalists to newsworthy events and offers tools for the collaborative verification of information, in which anyone with an Internet connection can theoretically participate (Hermida, 2012, 2010; Shirky, 2008; Zhang and Li, 2020).

The journalistic searchlight now scans Twitter in search of information to bring into greater public vision. Twitter serves both as a new institution aggregating information directly from the public and as a meta-institution that allows journalists to more efficiently scan the informatic output of more traditional institutions like government agencies, nongovernmental organizations (NGOs), universities, and political parties, which are themselves active users of the platform.

The importance of such awareness systems is perhaps greatest for the small, independent, Web-based outlets that are coming to play increasingly important roles as news providers in the Global South. At a historical moment when many countries' national media are being captured by authoritarian and illiberal governments and turned into propaganda machines, citizens are increasingly turning to independent news Web sites for reliable and critical reporting (Schiffrin, 2017). These outlets employ fewer reporters to attend traditional, institutionalized information-sharing events such as press conferences, public government proceedings, and demonstrations. Furthermore, an important element of their editorial independence lies in commitment to new models of news gathering that reduce reliance on institutional gatekeepers such as state bureaucracies and corporate public relations machines to tell them what is newsworthy (Fishman, 1980; Gans, 2004).

On Twitter, journalists can, in theory, find a greater diversity of perspectives and interests on which to base their decisions about what to cover and how to cover it (Broersma and Graham, 2013; Bruns, 2018). But whose voices are more prominent in journalists' awareness systems, whose are left out, and what might news organizations and Twitter itself do to maximize the platform's potential as a news gathering tool?

The ability of journalists to access information about diverse communities is vital to their public service role. In a classic mid-twentieth century study of the American press, Gans (2004) called this journalistic orientation *multiperspectivalism* — inclusive of multiple perspectives. However, Gans argued that mainstream U.S. journalism was not multiperspectival enough, in part because journalists routinely relied on a familiar cast of elite sources and institutions for information. Has Twitter changed the balance of access to the news media, or does it have the potential to do so?

There are, of course, limits to the diversity of voices that journalists access via Twitter. On top of the general “digital divide” between those with and without Internet access, Twitter usership skews elite in many countries, with Facebook the more popular platform among working-class Internet users (*e.g.*, Muindi, 2018; Mabweazara, 2013). Furthermore, many have recognized that state censorship of social media and legal actions against social media users can threaten journalists’ and other’s access to information (*e.g.*, Stupp, 2015; Simon, 2017). Others have pointed to impediments to social media’s potential to diversify information sourcing within journalistic culture itself. Studies of journalists around the world have found evidence of their “normalization” of social media: journalists adapting these new tools to fit pre-existing newsgathering and information sharing practices and carry on business as usual, for example by continuing to rely of elite gatekeepers as sources and agenda-setters [2].

Additionally, journalists using social media to source news face the problem that much online content is inaccurate misinformation or deliberately misleading disinformation (Jack, 2017). Over the past decade, powerful state, political, and corporate actors around the world have been increasingly active in organizing disinformation campaigns meant to sway public opinion and drown out dissenting voices (Morozov, 2011; Tufekci, 2018; Al-Rawi and Rahman, 2020). All contemporary political conflicts are now fought in part in the sphere of social media, with journalists wittingly or unwittingly recruited to amplify false information (Patrikarakos, 2017).

In recognition of these threats to the factuality and independence of the news, media organizations have placed renewed emphasis on fact-checking and verification (Neuberger, *et al.*, 2014; Graves, 2016; Thomson, *et al.*, 2022). New outlets have developed guidelines for using user content, which in some cases involve in-house fact-checking and in others involves “vicarious” verification: relying on larger news outlets or even platforms themselves for indicators of accounts’ and content’s trustworthiness and authenticity (Brandtzaeg, *et al.*, 2016; Carlson, 2018).

A trickier and less-understood issue is how social media platforms’ internal processes for organizing and displaying content might also affect news gathering and limit journalists’ abilities to access a diversity of perspectives (*cf.*, Brake, 2017). A key concept for understanding both the potential for and barriers to multiperspectivalism in online news gathering is the personalized allocation of attention. Social media platforms make some of the information they curate more immediately accessible to any given user while other content — based on the personalized profile a platform has built for that user — is invisible or requires more effort to find (Gillespie, 2014; Tufekci, 2017). Algorithms designed to maximize users’ “engagement” usually direct their attention to content and accounts based on the principle of *homophily*: the well-evidenced “birds of a feather flock together” logic that people prefer to communicate with those most similar to themselves (McPherson, *et al.*, 2001). The danger of this policy is that algorithms create or exacerbate the problem of “filter bubbles,” “echo chambers,” or “social silos,” in which closed-off groups of like-minded people rely on each other for information without moderating and diversifying exposure to different perspectives (Bozdag and van den Hoven, 2015; Pariser, 2011; Wihbey, *et al.*, 2019). The establishment of such echo chambers is a direct challenge to multiperspectivalism, which is based on the principle of *heterophily* (“opposites attract”).

To understand whether and how reliance on Twitter as a news gathering tool is affecting journalists’ access to information, it is instructive to look at real-world reporting practices. For case studies, we chose two Latin American online news outlets, one in Venezuela and one in Mexico. These were both practical case study selections — the outlets were small and centralized enough in their operations that we could interview and observe all consenting reporters and editors in the span of a few weeks — and strategic ones. Lightweight, digital-native news outlets are among those most dependent on social media for sourcing information because they lack the resources to engage extensively in some of the bedrock off-line reporting practices of traditional news media, for example dispatching correspondents to routinely attend press conferences or travel beyond their home cities. Examining the news-making processes of independent news Web sites in Venezuela and Mexico is also worthwhile because in both countries, such organizations are having outsized influences in shaping public conversations in political contexts wherein most mainstream media outlets stick to pro-government or apolitical content.

Taking as our case studies two Latin American online news outlets, one in Venezuela and one in Mexico, we conducted observations of and interviews with these journalists in December 2019 and January 2020. In addition to studying how participating journalists used Twitter in their everyday news gathering activities, we offered a pilot intervention by creating an alternative algorithm for recommending new accounts for those journalists to follow on Twitter. Our method of determining recommendations differed fundamentally from Twitter's own "Who to Follow" algorithm in one key respect: instead of recommendations based on inferred similarity to their recipients, we recommended accounts that we inferred were different enough to potentially add new perspective but also similar enough to be relevant to the journalists' professional beats (areas of specialization). We then asked participating journalists to complete a series of follow-up surveys asking whether they found our recommendation useful additions to their Twitter feeds.

The first section of this paper will describe the place of Twitter in the daily news gathering routines of two Latin American online news outlets, one in Venezuela and one in Mexico. The second section will detail the development and testing of our alternative algorithm designed to diversify participating journalists' Twitter feeds.

Part 1: Case studies

Venezuela

Informaciones.Ve (a pseudonym) is a small, online-only, independent, and government-critical news outlet based in a half-empty shopping center in Caracas' business district. A small group of prominent newspaper journalists established the Web site in the 2010s amid an uptick of state censorship and economic pressure on opposition print and broadcast media (Ezequiel, 2014). Informaciones.Ve's readership skews young and urban, with close to a million followers on Twitter (similar to the *Boston Globe* and as compared to some four–five million followers of each of the country's highest-circulation print news publishers: *El Nacional*, *El Universal*, and *ltimas Noticias*). The outlet employs some two-dozen staff journalists, of whom usually 10–15 are in the office during weekdays, with a skeleton crew of four or five on weekends. Most leave the office before dark, sharing rides with colleagues because of the high incidence of violent crime in Caracas and unreliability of public transit, and continue to work from home in the evening.

At the office, almost everyone sits in one big, open room with large desks for collaboration and — except for video editors who need large screens and a fast processor — uses a laptop. This arrangement allows journalists the flexibility to move and sit next to different groups of colleagues to collaborate on stories, and laptops' battery backup power prevents Informaciones.Ve staff from losing their work on the common occasion that a power outage hits. The flexibility of the office floorplan mirrors the flexible division of labor at Informaciones.Ve: though some reporters have their own specialties, everyone shifts to cover a variety of topics as needed, especially when important news is breaking. Except for three senior staff members who direct different aspects of daily operations, all are in their twenties or early thirties.

In a week spent observing Informaciones.Ve's newsroom, Arjomand found that Twitter plays a central role in everyday news gathering activities. Most journalists keep at least one Twitter tab (out of 5–10 tabs usually open) on their Web browser at all times and frequently refresh their homepage feeds, which display tweets and retweets of accounts they follow, as well as "promoted" ad tweets. Almost all Informaciones.Ve employees use their own personal Twitter accounts while at work. Only the two communications managers whom Arjomand observed logged in to the official @Informaciones.Ve account, both to post to Twitter and to monitor the site for breaking news. The communications managers also use Tweetdeck, a browser-based application owned by Twitter that allows a user to simultaneously track tweets related to multiple search terms and apply a variety of filters to content.

The other feature of Twitter that could plausibly serve as an awareness-system element is its "Trends" list,

which by default displays hashtags and words currently trending in the user's country [3]. This list could potentially alert journalists to breaking-news topics and to what Venezuelans with different perspectives are discussing, but *Informaciones.Ve* interviewees told Arjomand that they generally distrusted the Trends list, assuming that it was politically manipulated using bot and troll armies to promote pro-government hashtags and catchphrases. Analysts have indeed found evidence that both pro- and anti-government factions attempt to manipulate Twitter's trending list through both the use of bots and coordinated campaigns (Forelle, *et al.*, 2015; Peñarredonda and Karan, 2019; Gallagher, 2019). One communications manager told Arjomand that she sometimes does come up with news story ideas based on the trends displayed on Twitter, but these tend to be international stories, not news about Venezuela, which is *Informaciones.Ve*'s main focus.

Journalists participating in the study spent relatively little time monitoring the Web sites of other news organizations, and Arjomand never observed any reading of printed newspapers, though a state-owned live news channel TVes played continuously in one corner of the room. Arjomand visited the newsroom during a busy news week, when President Nicolás Maduro's challenger Juan Guaidó was ousted from chairmanship of Venezuela's National Assembly, and journalists would occasionally watch chaotic assembly proceedings on TVes, sometimes filming videos of the television set with their phones to post to Twitter.



Figure 1: Opposition leader Juan Guaidó speaks to reporters as police block him from entering Venezuela's Federal Legislative Palace in January 2020. Photo by Noah Amir Arjomand.

By and large, though, despite *Informaciones.Ve*'s small size and limited resources, it did not depend on larger, more established news organizations as agenda-setters and gatekeepers to nearly the extent observed by scholars who have studied newsmaking in the Global North [4]. Whereas journalists in the United States particularly tend to constantly monitor the outputs of competing and more prominent publications and news agencies (an awareness system predating the Internet), *Informaciones.Ve* journalists do not routinely frequent other Venezuelan news Web sites. The political economy of the country's media shapes *Informaciones.Ve*'s relative disregard for mainstream media. All of Venezuela's major television stations and newspapers, most of which initially opposed Chavismo (the ideology of Hugo Chávez, Maduro's predecessor and an early adopter of Twitter), have been effectively captured by the Maduro government, in most cases through sales to pro-Maduro businesses under intense economic and political pressure (Calderón and Herrero, n.d.; Elser, 2015). *Informaciones.Ve* journalists do not view national news organizations as authoritative and reliable institutions whose outputs *Informaciones.Ve* would be wise to follow, but as part of the state propaganda machine.

Informaciones.Ve journalists do, however, use Twitter to follow individual colleagues working for other news outlets, including prominent pro-Maduro journalists. The news aggregator @ReporteYa, a small Caracas-based, Twitter-native operation continually retweeting and providing links to breaking news from publications, independent, and citizen journalists, NGOs, and the Catholic Church (an important source for information from outside of Venezuela's big cities), is a particularly important social media gatekeeper and element of *Informaciones.Ve* journalists' awareness system.

Twitter thus serves as the platform through which *Informaciones.Ve* journalists access information from both emergent and traditional institutions, both through secondary intermediaries like @ReporteYa and by directly following accounts of state agencies, political parties, church officials, and other organizations and their leaders. According to *Informaciones.Ve* journalists, the latter often serve as more reliable sources than official state Web portals and reports. For example, when researching shutdowns of the Caracas metro system (both due to electrical blackouts and intentionally to hinder anti-government protesters during periods of mass demonstrations), one investigative reporter found that although government-published statistics inaccurately claimed that the system had a nearly perfect record of uninterrupted service, the Metro de Caracas Twitter account had tweeted each time there was a shutdown, which tweets she could tally to produce her own count, much higher than the government's.

Journalists' reliance on Twitter is unsurprising given that approximately a quarter of Venezuela's population uses Twitter, the highest rate in Latin America (Calderón and Herrero, n.d.). Far more Venezuelans use Facebook, but most *Informaciones.Ve* journalists reported using the platform only for personal communications and not as a reporting tool. Arjomand observed that whereas most of the outlet's employees keep multiple Twitter tabs open on their browsers at all times, only a few of their computers routinely display an open Facebook tab. Those journalists who do use Facebook and Instagram professionally find it useful mainly for people-finding, that is, for contacting specific individuals to interview for stories they are already pursuing, rather than as awareness systems to monitor breaking news and generate new ideas for stories to pitch.

A platform that serves as both a people-finder and a significant element of journalists' awareness system is WhatsApp. WhatsApp's group messaging feature is in common usage in Venezuela, with groups ranging from neighborhood associations to networks of NGOs privately sharing information. The benefit of WhatsApp compared to Twitter is privacy: Twitter users and journalists have been arbitrarily arrested for public online speech, especially since the 2017 enactment of a vague but broad anti-hate speech law that the state has applied in partisan fashion (Freedom House, 2020). The audience for WhatsApp messages is private, and so the platform is better suited to sensitive communications [5]. For example, one reporter focused on the Caracas crime beat showed Arjomand the discussion thread of a private WhatsApp group in which police officers leaked information about ongoing investigations and crime reports to him and other journalists. *Informaciones.Ve* curates its own large WhatsApp group in which the outlet communicates with readers and sometimes crowdsources information, especially as a means of independently collecting economic data when information from the government is unreliable, for example asking readers to report

electrical blackouts in their neighborhoods, shortages at their grocery store, or the time they spend waiting in line for gasoline at local stations.

Informaciones.Ve journalists do not rely entirely on social media for information. They leave the newsroom to report from the street — though they rarely leave Caracas — and interview sources by phone. Nonetheless, where Twitter stands out from traditional news gathering methods is in the platform's greater ability to alert journalists to emergent stories and new sources of which they were not already aware. A reporter might be dispatched to cover a political protest, but only after Informaciones.Ve has become aware of that protest through Twitter [6].

Informaciones.Ve journalists are aware of potential limitations to their field of view provided by Twitter and WhatsApp. Information contributors' use of all these media is limited by access to Internet and electricity, which cannot be taken for granted in Venezuela. Power outages are a frequent impediment to digital communications; blackouts are usually short-lived in Caracas, but often last for days on end in provincial cities and rural areas. This reality creates something of a "Caracas bubble," which is exacerbated by algorithmic and social "filter bubble" effects in friend-follower networks on Twitter.

It is important to note, however, that although Informaciones.Ve journalists report critically on the Maduro government, their blind spots on Twitter (*i.e.*, the important content missing from their personalized feeds) are not primarily partisan. Whatever their personal views, Informaciones.Ve journalists see it as their professional duty to maintain awareness of what Maduro supporters are saying on social media, and so follow and otherwise monitor numerous accounts of politicians, journalists, and others associated with Chavismo. Rather, if Informaciones.Ve journalists are in an echo chamber on Twitter, it is because they disproportionately follow the accounts of traditional media gatekeepers: other journalists and news organizations, celebrities like actors and athletes, political elites, government agencies, NGOs, professors and academic institutions, and aggregators like ReporteYa who in turn retweet content from that same familiar cast of gatekeepers. Twitter serves as an efficient means of monitoring those gatekeepers, and it makes sense for journalists to follow such sources.

To provide a rough quantitative picture of whose Informaciones.Ve journalists are most likely to see when they log in to their Twitter home feeds, we collected a list of all accounts they followed. We then selected a random one percent sample of those followed accounts to manually analyze, yielding a total of 201 usernames (The 15 participating Informaciones.Ve journalists followed around 1,400 accounts each on average). We read the users' self-descriptions and followed links found under their profile pictures, reviewed their recent tweets, and cross-referencing names with Web searches in order to determine their primary occupation or the type of organization the account represented [7]. The categories according to which we coded the data offer an admittedly imprecise measure of elite gatekeeper status. President Maduro, municipal-level opposition politicians, and foreign diplomats were all included within the "Politics/State Bureaucracy" category; everyone from European soccer stars to local radical art collectives fit within "Art/Culture/Entertainment". Nonetheless, the oversized presence of other journalists and absence of other segments of the population from journalists' Twitter feeds is evident in this data. For example, an estimated 7.3 percent of Venezuela's labor force is employed by the agriculture sector — which has been under severe and potentially newsworthy strain in recent years — yet not a single one of the 201 randomly selected accounts could be identified as a farmer or as otherwise involved in the sector (CIA World Factbook, 2022; Kurmanaev and Herrera, 2019).

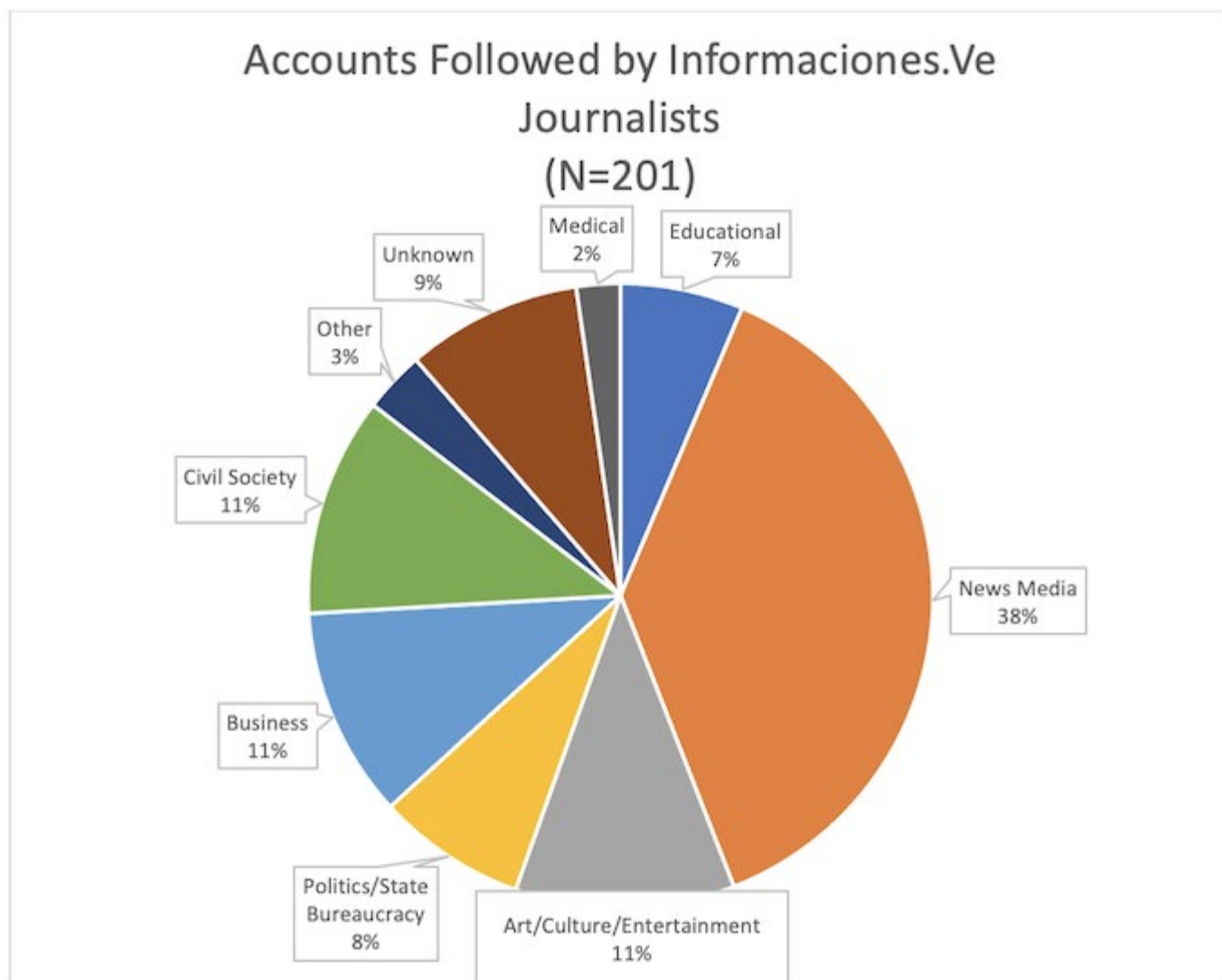


Figure 2: One percent sample of accounts followed by Informaciones.Ve journalists.

Not just unconscious elitism but also well-founded worries about online misinformation also contribute to the pattern of homophily in Twitter following practices. Informaciones.Ve journalists are justifiably wary of following accounts of individuals they do not know outside of social media, especially those lacking Twitter’s blue check badge indicating that the platform has verified that the account is in fact controlled by a “prominently recognized individual or brand.” (Twitter, n.d.-a) To explain her hesitancy to follow unfamiliar accounts, one journalist cited examples to Arjomand of accounts with large follower counts claiming to be radical opposition supporters but later unmasked as government affiliates attempting to goad real opposition Twitter users into extremist and illegal speech, for instance by calling for Maduro’s assassination (see also Puyosa, 2019). Though the pattern of relying on known and verified information sources is understandable, it also undermines the potential for the platform to enlarge Informaciones.Ve’s awareness system to include non-elite information sources who might provide new perspectives and inject new information into the Caracas bubble [8].

Mexico

Occupying a three-story building down a side street from Mexico City’s bustling Avenida de los

Insurgentes, the office of a news Web site we will call Noticias.Mx (a pseudonym) is, unlike its Venezuelan counterpart, in operation 24/7. The outlet was founded in the early 2010s under family ownership and is known for an editorial policy of criticism toward governments of both the Institutional Revolutionary Party (PRI) and current incumbent Morena party, in-depth crime reporting, and relatively high-brow cultural journalism [9]. Noticias.Mx's Web site is highly ranked for traffic among the country's media producers, and the outlet has amassed around 1.5 million Twitter followers (as compared to 5.1 and 6.4 million respectively for leading national newspapers *Milenio* and *El Universal*).

The division of labor is more clearly defined at Noticias.Mx than at Informaciones.Ve and corresponds to the office floor plan. After passing the ground floor reception, kitchen, and meeting areas and climbing to the second floor, a visitor passes the office of the editor-in-chief to find Noticias.Mx's investigative reporting unit. The unit's six reporters variously specialize in their own subjects and methods — political corruption, drug violence, women's rights, labor, the environment, big data, social media analysis — but collaborate with one another on investigations, taking days and sometimes weeks to write feature stories, months to produce thematic series.

Climbing up to the third floor, a visitor reaches the office of Noticias.Mx's deputy director and, under her supervision, a large room divided into desk islands that represent different editorial units, each containing four to five computer work stations: soft news (entertainment, science, celebrity gossip, sport), hard news (crime, politics, the economy), community management (interaction with readers and other social media activity), and the weekend cultural and literary supplement. Two televisions, consistently ignored during Arjomand's observations, are mounted high on the wall on either side of the room and perpetually play the 24-hour news and talk show network *Milenio* and a sports channel, respectively.

The journalists working on the third floor are mostly in their twenties, several years younger and less experienced on average than the investigative reporters of the second floor. Each editorial unit has a leader with the title "head of information;" their subordinates hold the title of "editor," though "aggregator" might more accurately describe the work that most do. The pace of work and deadlines is much faster on the third floor than downstairs in the investigative units. The third-floor editors' orientation toward multitasking and quick work as compared to the more deliberate and focused approach of second-floor reporters is reflected on computer screens: editors tend to have 10–20 browser tabs open at any given time, while reporters average around five tabs at a time, by Arjomand's count.

Editors identify and pitch potential stories to their heads of information, who in turn pitch to the deputy director. Once their story idea is approved, editors take anywhere from a few minutes to a few hours to create a story of a few hundred words using information and images they collect online. During Arjomand's week of observation of Noticias.Mx's newsroom, editors rarely interviewed sources by phone or using social media messaging. The information, pictures, and videos that editors included in stories were sourced almost entirely from Twitter, YouTube, Facebook, and/or other news publications without any communication with the content's producers.

This division of the outlet between investigative reporters and daily news editors is key to Noticias.Mx's business model. Editors create a continuous flow of content on an hourly basis, which is thought to encourage readers to visit the site multiple times a day, and ensure that Noticias.Mx covers the same major breaking news stories as other national publications, albeit without doing much original reporting beyond what they can find on social media, most importantly Twitter. The short daily news stories serve both to secure advertising revenue and to attract visitors, with the hope that their attention is then drawn to the stories of which the editor-in-chief is most proud: the original investigations produced on the second floor, which Noticias.Mx strategically publishes at times of day with the heaviest Web traffic.

Nearly everyone working at Noticias.Mx has at least one Twitter tab open on their browser throughout their time in the newsroom. Though a smaller percentage of the population (<10 percent by Curiel, *et al.*'s [2020] estimate) uses Twitter in Mexico than in Venezuela, Twitter serves as the primary medium for official public communications by government officials (rivalled only by President Andrés Manuel López

Obrador's daily two-to-three-hour morning press conferences), companies, and organizations like the Bank of Mexico. In recent years, it has also become common for ordinary citizens to write testimonials and complaints (*denunciós*) on Facebook and Twitter about their personal experiences with corruption, which sometimes go viral and become stories at Noticias.Mx once "verified" — which in the case of second-floor reporters means *once investigated* and in the case of third-floor editors means *once reported by a different news outlet they deem reliable*.

As with Informaciones.Ve, we collected a random one percent sample of all Twitter accounts followed by 17 participating Noticias.Mx journalists (who followed around 1,050 accounts each on average, somewhat fewer than their Venezuelan counterparts). Reading through the profile descriptions and tweets and searching names associated with these 178 selected accounts revealed the same general pattern evident at Informaciones.Ve: journalists follow colleagues and news organizations first and foremost, followed by cultural, political, educational, and civil society figures and organizations. This aggregate figure does not, however, capture variation based on reporting beat or organizational role. For example, of the 17 selected accounts that Noticias.Mx's literary editor followed, 11 belonged to artists or art institutions.

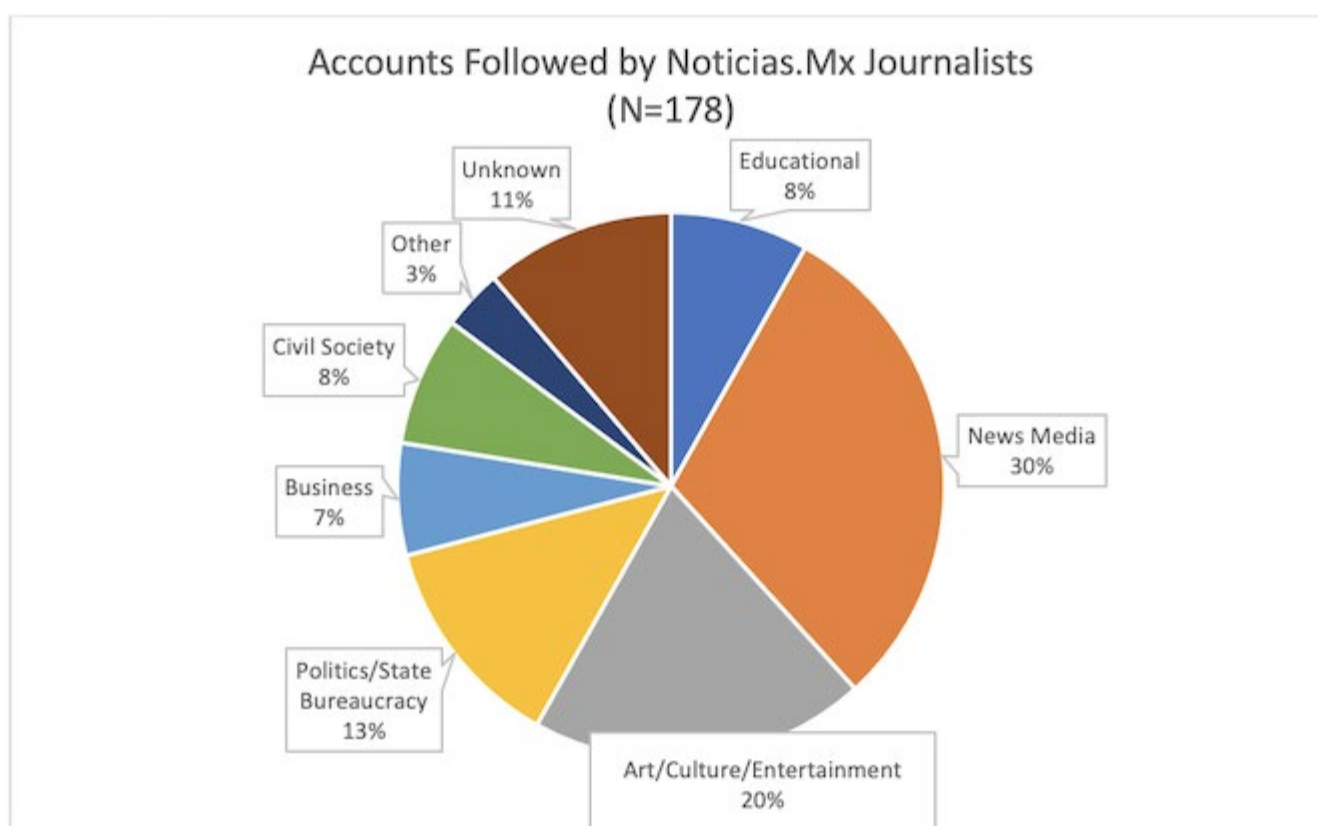


Figure 3: One percent sample of accounts followed by Noticias.Mx journalists.

There is a good deal of variation in how different Noticias.Mx journalists use the platform. Editors follow public figures such as politicians and celebrities, other news outlets and journalists, as well as beat-specific accounts; for example, the entertainment editor follows the accounts of many production companies and prominent figures in the film industry. Unlike at Informaciones.Ve, editors also closely monitor topics that

are trending and often write on subjects specifically because they appear on Twitter's Trends list. Some editors toggle between Mexico, United States, and personalized trends lists as Noticias.Mx frequently produces aggregated stories on U.S.-based topics.

Some editors and community managers routinely use apps including Twitter-owned Tweetdeck and Facebook-owned Crowdtangle as complements to the platforms' user interfaces to detect trending topics and posts. When an editor sees a keyword or hashtag is trending that may be relevant to their beat, they will click it, skim the top tweets (deemed "top" by a Twitter relevance-ranking algorithm), then check if other news outlets have covered the topic yet. For daily news editors, the very fact that a topic is trending or that other news outlets or famous people are paying attention to it is a primary criterion for news worthiness.



Figure 4: A Noticias.Mx editor uses Tweetdeck to monitor Twitter activity related to the uncovering of mass graves of victims of drug cartel violence. Photo by Noah Amir Arjomand.

Compared to their Venezuelan counterparts, Noticias.Mx editors spend much more time monitoring other news Web sites as part of their awareness systems. This difference stems from a combination of political and editorial factors: although Noticias.Mx interviewees criticized mainstream print and TV news for avoiding critical reporting in favor of tabloid-style sensationalism and consistently toeing a pro-government line (despite the recent changing of the political guard from a series of center-right presidents to populist-left Obrador), Mexico does not have the degree of ideological polarization and media capture seen in Venezuela. Furthermore, much of the editors' news aggregation involves relatively apolitical stories on pop

culture, sports, and science. An additional difference between Noticias.Mx and Informaciones.Ve's respective relations with other news outlets is that the former has syndication agreements with a group of other independent online news outlets based around Mexico, which allow partner organizations to focus on their own regions and subjects of specialization while still being able to provide Mexico-wide coverage on their individual sites. Part of the third-floor editors' jobs is to scan those partner Web sites for news stories to copy and paste *verbatim* or with minor changes to Noticias.Mx's Web sites.

Compared to its editors, Noticias.Mx's investigative reporters are more interested in, and have more time to explore, obscure but potentially interesting information that they could be the first in the news media to cover. The reporters are less systematic than the editors in following formal institutions relevant to their beats and instead have Twitter feeds populated most prominently by tweets from NGOs and colectivos: organized groups of citizens affected by an issue that constitute an important sector of Mexican civil society. Compared to the editors, the reporters pay less attention to Twitter's Trends list and spend more time scrolling through their Twitter homepage feeds looking for tweets relevant to their current investigations or that might give them an idea for a new one. During Arjomand's week in Mexico City, for example, a feminist activist group occupied and shut down classes in one department of the city's largest university over #MeToo complaints about faculty harassing female students. The reporter who covers the activism/protest beat saw tweets from a feminist colectivo that was organizing the action and then contacted them to request that they put her in touch with activists staging the occupation.

When it comes to reporting on issues that involve people who are not publicly oriented as activists or professionals in media-adjacent fields, the reporters often use Twitter and Facebook in combination. One reporter who specializes in human rights and particularly in missing persons (forced disappearances, both political and non-political, are shockingly common in Mexico [Wilkinson, 2018]) is often alerted to a disappearance on Twitter by the account of a human rights NGO or colectivo, then searches for the victim and their relatives and friends on Facebook, which is in much more common usage among Mexicans outside the media-oriented elite, to request phone interviews.

While the editors work exclusively from their desks, the investigative reporters do leave the office to conduct interviews or attend events. As at Informaciones.Ve, however, reporters do not leave the capital city for work. Noticias.Mx lacks the resources to support extensive travel; also, much investigative unit reporting focuses on sensitive topics including drug cartel violence, political corruption, and other crimes, and traveling to report from on location could put reporters at risk. Mexico led the world in 2020 in the number of journalists murdered in retaliation for their work, with killers enjoying impunity in most cases (Committee to Protect Journalists, 2020). Several Noticias.Mx employees in fact moved to Mexico City and joined the outlet after they had to leave their hometowns because of threats and dangers they faced because of their journalistic activities for other publications. For first-hand reporting elsewhere in the country, the outlet depends on syndicate partners in other states.

Those partnerships with regional news outlets, as well as the greater reliability of electricity and Internet access across Mexico than across Venezuela, mean that Noticias.Mx may face less of a "capital city bubble" problem than Informaciones.Ve. Nonetheless, the fields of vision of various Noticias.Mx journalists are limited by whom they follow on Twitter. Third-floor editors rely heavily on the tweets of elite agenda-setters including state agencies, national news outlets, and celebrities for story ideas. This focus is, however, not necessarily a bug but a feature of their awareness systems, as those editors' central task is to keep Noticias.Mx's Web site up to date on the topics that are already prominent elsewhere in Mexican news and social media [10].

Second-floor investigative reporters, on the other hand, have a greater interest in cultivating online awareness systems that incorporate a diversity of non-elite voices that could inform their original reporting. They follow accounts further outside the mainstream elite, particularly of organizations and collectives that aggregate and amplify the voices of citizens harmed by crime, environmental degradation, or discrimination. This following practice (amplified, no doubt, by Twitter's recommendations of further accounts for them to follow, based on the pattern they have established) can lead to its own ideological

blind spots, however. One reporter told Arjomand unprompted that she felt that she was trapped in a social media bubble because the people she followed on Twitter nearly all had similar political leanings to her: the *colectivos* and independent journalists who populated her feed were economically and socially progressive, and she had much less awareness of the conversations occurring on social media among users of different political factions.

Discussion of fieldwork findings

Informaciones.Ve and Noticias.Mx differ somewhat in their divisions of labor, the news beats they cover, and their relations with the state and with other professional news media in their respective countries. Despite these differences, a broad pattern emerges when it comes to Twitter as a news gathering tool. Both publications' journalists use Twitter as a central element of their awareness systems, which also include elements such as the national news media (whether accessed through news Web sites or newsroom televisions sets) and other social media platforms like Facebook or WhatsApp groups. In both cases, journalists find Twitter most useful for generating ideas for stories and Facebook most useful for people-finding. In accordance with other studies of digital newsmaking practices, we found that Informaciones.Ve and Noticias.Mx journalists tended to draw on elite sources when using Twitter (Mabweazara, 2010; Nordheim, *et al.*, 2018; Selnes and Orgeret, 2020).

There is some variety to how journalists at the two publications use Twitter, but nearly all can be found refreshing their homepage feeds on an hourly basis in search of new leads that could turn into stories. Because journalists closely monitor their homepage feeds, their own personal friend-followers networks do significantly shape their field of view on Twitter. This “silo” effect is, however, mitigated by their use of additional tools like Twitter's advanced search feature, trending lists (more at Noticias.Mx than at Informaciones.Ve), and Tweetdeck. Apart from the community managers of both publications, all journalists use their personal Twitter accounts while at work.

The facts that journalists relied partially upon their personalized friend-follower networks and used their personal accounts for work made possible the pilot intervention described in [Part 2](#) below. We offered journalists recommendations of new accounts to follow using an algorithm that we designed to increase the diversity of Twitter feeds. We expected the receptivity of journalists participating in the study to those recommendations to vary based on their professional duties. Journalists whose job is to conduct original research over the course of days or weeks would likely be more open to new, less-immediately-relevant perspectives populating their Twitter feeds than those needing to produce short stories about trending topics with maximum efficiency. We thus expected recommendations of unfamiliar sources to be more useful to second-floor reporters than to third-floor editors at Noticias.Mx. We expected to find less variation among Informaciones.Ve journalists, given the less differentiated division of labor and less hierarchical organizational structure that Arjomand found there.

Part 2: Rethinking Twitter's “who to follow” (WTF) algorithm

Homophilic vs. heterophilic algorithms

Before describing our pilot intervention to design an algorithm producing recommendations of new accounts for participating journalists to follow, it is worth explaining how Twitter itself determines which accounts to suggest users follow. First, three definitions: a “seed account” is our term for the Twitter account to which recommendations are provided; a “follower” is an account that has signaled to Twitter that they would like tweets from another account to appear in their main homepage feed; and a “friend” is an account whom a given user has followed [[11](#)].

Twitter provides its users with two different kinds of “Who [sic] to Follow” (WTF) recommendations. Each

relies on homophily (“similar users also make good suggestions”) but infers similarity using a different measurement. The first is for what Twitter’s design team calls “authorities”: accounts with many followers that tweet about subjects that Twitter’s algorithm infers the seed account user will find interesting, based on whom else they follow and the hashtags and keywords used by those friends. These “authorities” tend to be large organizations, celebrities, and other opinion leaders with many followers. The second kind of recommendation Twitter offers is for what their team calls “hubs”: potential friends whom Twitter’s algorithm infers are within the seed account’s “circle of trust” because they share numerous friend-follower interconnections. These “hubs” tend to be less prominent people and organizations with whom Twitter thinks the seed account would want to join in an online community and with whom the seed account user is likely to already be in the same social circle outside of Twitter (Gupta, *et al.*, 2013). Additionally, Twitter recommends “promoted” accounts whose owners have paid Twitter to be so recommended.

Originally, Twitter used only internal data on friend-follower networks and tweet contents to produce WTF recommendations. Since then, they have introduced more complex and external variables, depending on the permissions a user grants Twitter, which can include users’ address book lists of contacts outside Twitter, location, and interactions with third-party Web sites that share data with Twitter (Twitter, n.d.-b). Nonetheless, the basic logic of homophily has remained the guiding principal for Twitter’s WTF recommendations.

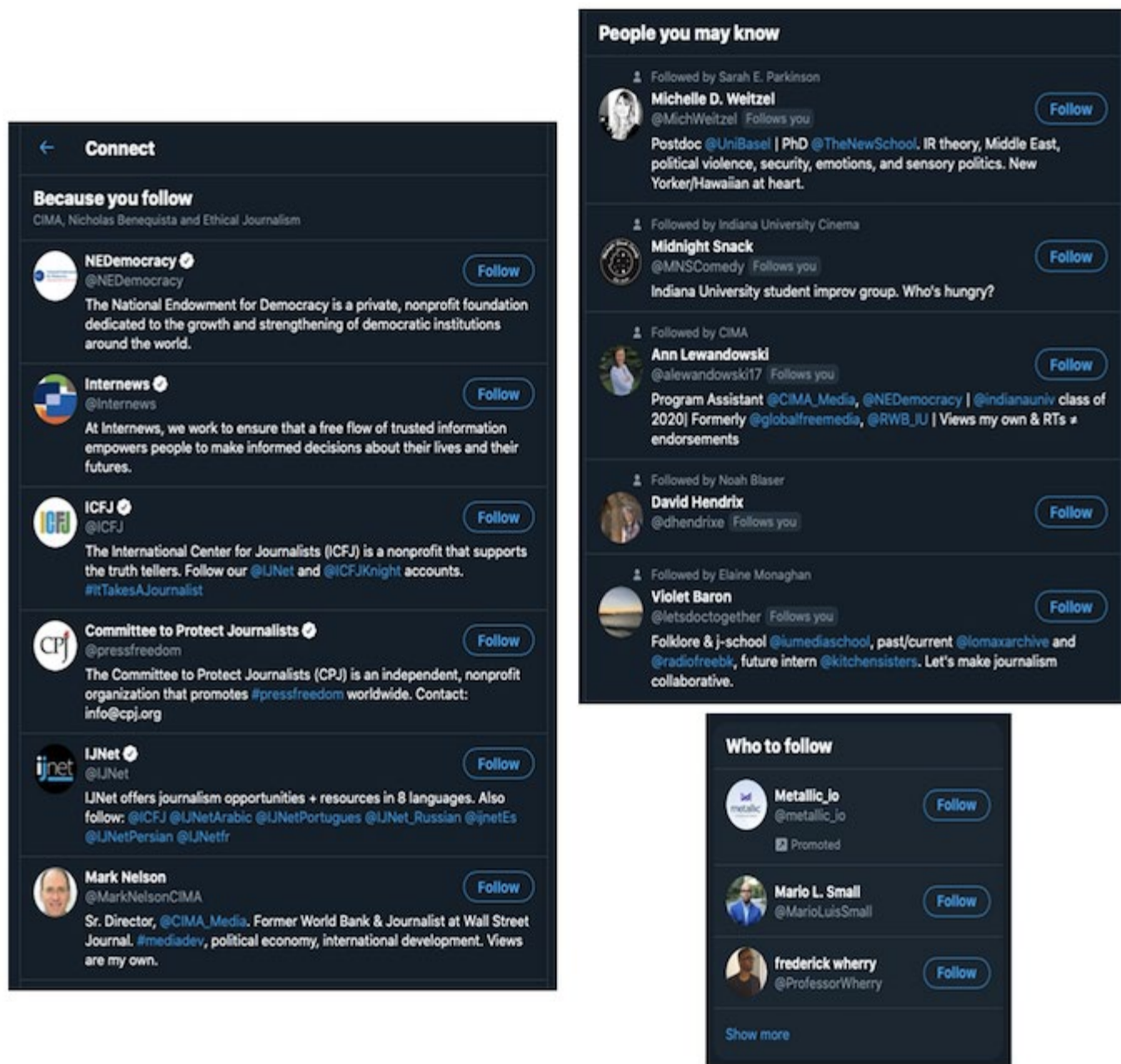


Figure 5: Examples of Twitter WTF recommendations provided to Arjomand.

In contrast, we designed a heterophilic algorithm that goes in the opposite direction by introducing the seed account to potential friends who are different rather than similar, in order to encourage a multiperspectival awareness system. Our approach is based purely on the structure/topology of a seed account's (*i.e.*, a participating journalist's) friendship network. The main intuition is to find friends of the seed account who could possibly serve as a "bridge" between the community/bubble that the seed account is part of, and other communities/bubbles in its topological vicinity, *i.e.*, removed by only two degrees of separation from the seed account.

The decision to constrain our recommendations to topologically close accounts was informed by the theory discussed in the introduction that journalists are best served by a balance of similarity and difference among

sources who inform their awareness systems. If we had recommended accounts that were simply as different as possible from each seed account journalist, they would likely be entirely irrelevant to the journalist's work and possibly incomprehensible, as they were contributing to entirely different online conversations from those the journalist knew. By selecting heterophilic recommendations from within a seed account's topological vicinity (which we, following Twitter's lead in its "hubs" recommendations, infer to be similar to the seed account), we hoped to produce recommendations different enough to offer new perspectives but similar enough to be newsworthy, in their recipient's judgment.

A hypothetical example: journalist Juana followed friends Fernando and Fatima; Fernando follows Juana, Fatima, Ricardo, and Reynaldo; Fatima follows Rebeca, Reynaldo, and Regina. The algorithm infers that Fatima is more different from Juana than is Fernando, because Fernando follows a higher proportion of Juana's immediate network of contacts. Then, in determining which of Fatima's friends would provide the best heterophilic recommendation for Juana, the algorithm compares the list of Rebeca, Reynaldo, and Regina's friends to the list of accounts Juana follows. The heterophilic algorithm recommends Juana follow Regina, because her network of friends has the least similarity to Juana's. The inference is that Regina is likely party to different conversations on Twitter than Juana, and thus that her tweets and retweets on unfamiliar issues or offering alternative views might enhance the multiperspectivalism of Juana's Twitter feed. Twitter's homophilic algorithm, by contrast, would have offered Reynaldo as a "hub" recommendation because of his connections with Juana's "circle of trust."

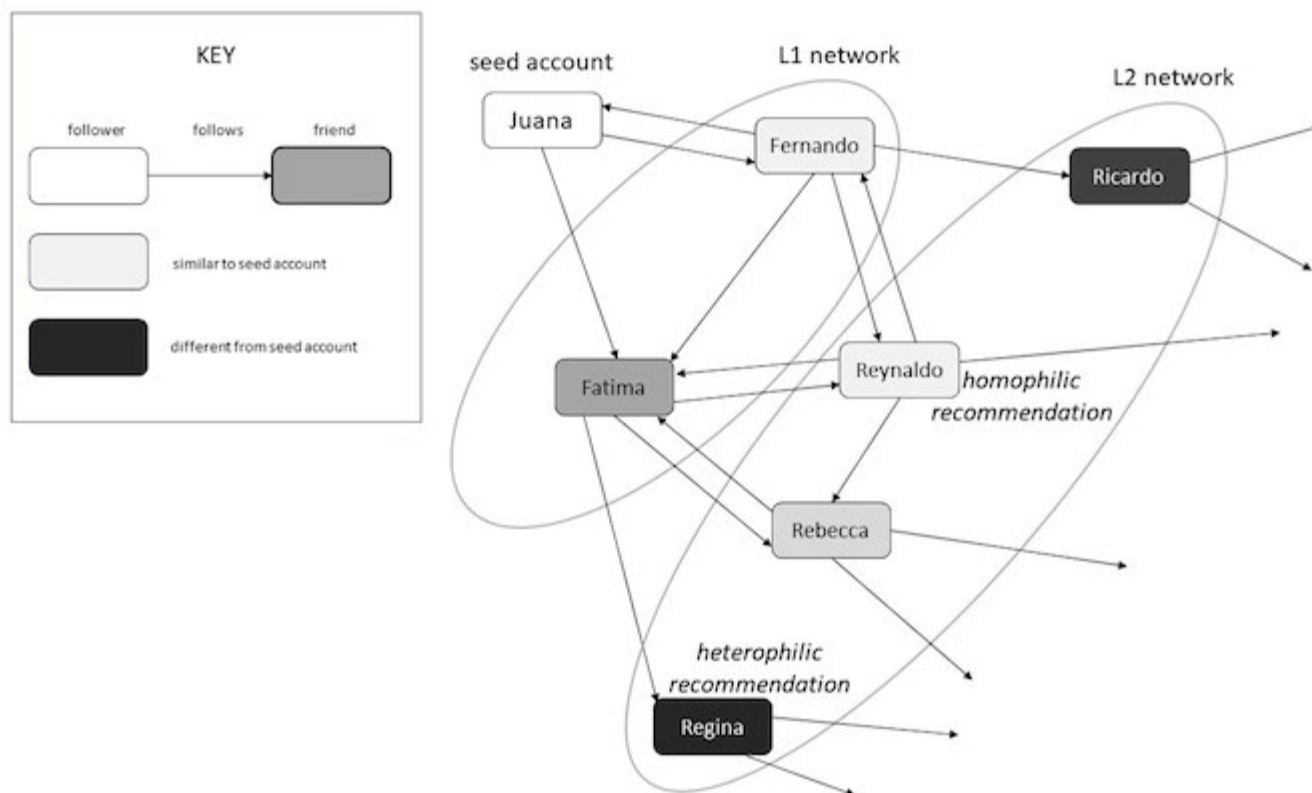


Figure 6: Hypothetical diagram of journalist Juana's friends-followers network on Twitter.

A more technical, detailed, and caveat-laden explanation of our algorithmic design is as follows (see also

the [Appendix](#) for step-by-step instructions). The algorithm starts from the friend list of a given seed account (publicly available data through Twitter's application programming interface [API]), which we call the seed account's Level-1, or "L1 original", as in one degree of separation. For every node (friend) in the L1 original, we collect its Twitter profile and only keep the friends that have tweeted at least 10 times, have tweeted at least once in the last seven days at the time of data collection, are not "verified" or "protected", and have between 100 and 5,000 followers and follow 5,000 or fewer accounts (the "L1 set"). The purpose of this limitation is to weed out accounts that are unlikely to be useful as sources and offer new perspectives because they are infrequent users of the platform, as well as accounts with friends-and-followers networks that are impractically large. We instituted the latter policy for pragmatic reasons due to our limited data collection and computer processing resources: as it was, it took us days to collect each L2 network (defined below) and run the algorithm to sort its nodes into a short list of recommendations.

We then use Twitter API again to collect the friends of the L1 set, which we filter according to the same criteria with which we filtered L1 nodes. We call this list the L2 set of the seed account, *i.e.*, the accounts followed by the selected sub-set of accounts which the seed account follows. This allows us to calculate a quantity we call the *Outgoing Ratio (OR)* for each member of the L1 (*i.e.*, the seed's friends). For each account X that belongs to L1:

$$\text{OR score} = 1 - \text{InFriends}/\text{AllFriends}$$

where *InFriends* is the number of friends X has in the set containing L1 nodes and the seed account, and *AllFriends* is the total number of friends of X . The intuition behind OR score is that when Friend X of a seed has a higher OR score, a greater ratio of the nodes it follows are not part of the seed account's immediate friends network. As such, there is a higher probability that X would be a bridge to other bubbles/communities unfamiliar to the seed. We sort the L1 nodes in a descending order of their OR scores, keeping only the L1 nodes with the top 20 OR scores, which we call "L1 bridges". As with limitations on the L1 nodes' friends count, this was another arbitrary decision to keep our dataset manageable given our limited resources while allowing us to produce an appreciable number of recommendations for each journalist.

Our recommendations are drawn from L2 nodes who are linked (via two degrees of separation) to the seed through one of the L1 bridges. L1 bridges link to thousands of L2 nodes, which we again sort following the heterophily principle, with similarity again inferred by the overlap between two nodes' respective networks of friends. For every node in L2, we calculate the pair-wise similarity score between that node and its respective L1 node. The notion of similarity here is defined as the number of common friends between two nodes:

$$\text{Similarity score (L1,L2)} = \text{Friends(L1)} \cap \text{Friends(L2)}$$

The purpose of this quantity is to determine how much similarity we would like to allow between any given L1 bridge and its L2 friends, which could potentially be party to online conversations different from those occurring in the L1 network that populates the seed account's Twitter feed. After calculating similarity scores, we only keep those with the similarity scores of 0 or 1. This allows some minimal similarity between L1 and L2 nodes as acceptable. At this point we compile a list of the L1 bridges and their respective L2 nodes with similarity scores 0 or 1. In some cases, we found only one L2 node for an L1 bridge, but other L1 bridges were linked to more than a hundred L2 nodes with low similarity scores. This meant that we needed a further mechanism for choosing top recommendations among L2 nodes. We decided to rank associated L2 nodes in decreasing order of the number of followers they had (with the intuition that more-followed accounts would be of more interest to participating journalists) and then to manually select the top-ranked account that listed its "home location" as a place in Mexico or Venezuela, depending on whether the seed account was a Noticias.Mx or Informaciones.Ve journalist (based on the fact that both outlets report primarily on their own countries), or the overall top-ranked account when none identified themselves as based in the country (account location is optional for users to input).

As with previous semi-arbitrary decisions, these ranking and filtering choices would ideally be made adjustable in any end product so that users could find recommendations (with themselves as the seed account) to fit their particular needs. The algorithm that we designed was an admittedly blunt instrument for a fine-grained job, reliant upon our intuition based on fieldwork as to the kinds of recommendations that could, in general, be most useful and diversifying to journalists participating in the study. Our ultimate recommendations were the top L2 nodes, filtered for dissimilarity and location and ranked by follower count, for each L1 bridge.

Our recommendations

As compared with the accounts that journalists at *Informaciones.Ve* and *Noticias.Mx* already followed (see Figures 2 and 4), those we recommended to them were less likely to belong to other journalists and news organizations. Whereas 38 percent of sampled accounts followed by *Informaciones.Ve* journalists and 30 percent of those followed by *Noticias.Mx* journalists were associated with the news media, those percentages dropped to 10 percent and 13 percent, respectively, in accounts recommended based on their inferred dissimilarity from our research participants. Anecdotally, the recommended news media accounts tended to be more specialist than those already followed, for example covering news about gold, computer hacking, niche lifestyles, or even hardware fasteners. Such specialized news might be relevant less often to participating journalists, but also redundant less often. These findings suggest that following recommendations based on a logic of heterophily could indeed help journalists to escape “echo chambers” of their peers on Twitter.

Accounts Recommended to *Informaciones.Ve* Journalists
(N=284)

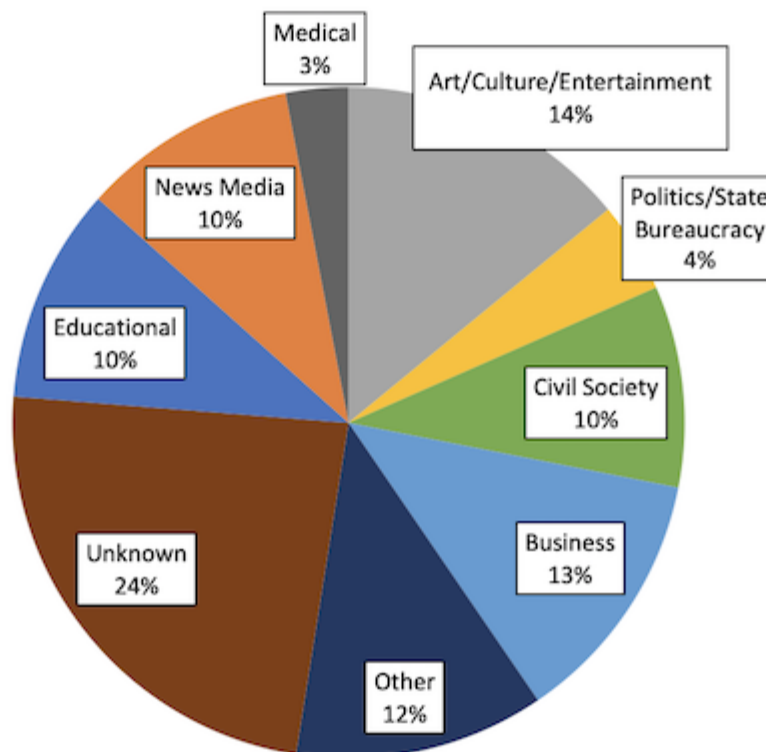


Figure 7

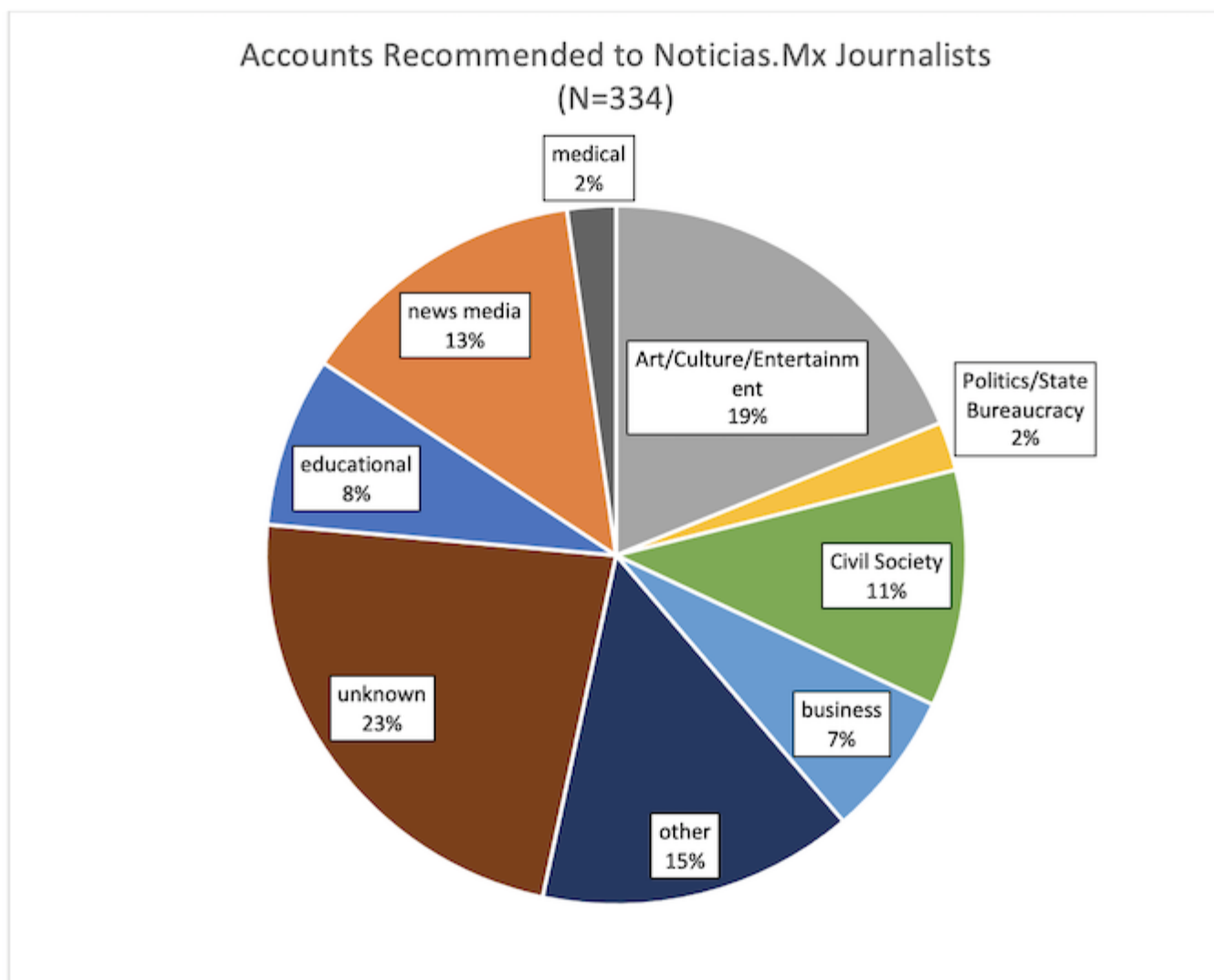


Figure 8

In the case of both news organizations, the largest increases from followed to recommended accounts were in the “other” and “unknown” categories. There were numerous students, satirical accounts, spiritualists, sex workers, and individuals tweeting about very specialized subject matter like cryptocurrencies or handicrafts. The greater proportion of “unknown” accounts, *i.e.*, those whose users we were unable to confidently identify or classify through individual inspection, is actually an indicator of less elite status among account holders. Ordinary people are, we inferred from reviewing these hundreds of accounts, less likely to post abbreviated resumés or links to professional or organizational Web sites than are elite media gatekeepers. The question was whether these recommended accounts, while diverse and more representative of non-elite Internet users, also met the criteria of being useful to participating journalists, or

whether the information they tweeted would simply be irrelevant noise cluttering journalists' Twitter feeds. The question also remained whether journalists would trust or even bother to verify information from unfamiliar, and often unidentifiable, accounts.

Journalists' responses

In September 2020, we provided a personalized list of 20 recommendations (in a few cases, less than 20 because multiple L1 bridges linked to the same L2 node) to each of the 32 total journalists from the two news outlets (17 from Noticias.Mx; 15 from Informaciones.Ve) who provided Arjomand with e-mail addresses during his fieldwork and agreed to continue to participate in the study. We requested that journalists follow those accounts and distributed an online survey in which we asked them to evaluate their initial impressions of the potential for the accounts we recommended to provide them with information that could inform their journalism. Over the next three months (October through December 2020), we sent an additional three surveys to participants through which they could notify us if and when they did come across items of interest from those recommended accounts in the course of their routine monitoring of their Twitter feeds.

Several factors unfortunately limit our ability to draw conclusions from journalists' survey responses. The small number of study participants made it impossible to produce statistically significant findings or use control groups provided with random recommendations or recommendations taken from Twitter's WTF lists. This was the trade-off of mixing ethnography with network analysis and being able to observe in person how each of the participants was using Twitter on a daily basis.

Furthermore, we underestimated the challenge of convincing busy journalists to repeatedly fill out online surveys, even with a small financial incentive of US\$10 per survey response and with reminders after each month's survey was sent. The low response rate may have been exacerbated by the COVID-19 pandemic: journalists at both outlets who did remain in communication informed us that they found that remotely collaborating with their colleagues increased their workload and burnout, and with staff working from home, we could not depend upon the directors of either publication to make announcements in the newsroom about surveys on our behalf.

Just 10 out of 32 responded to one or more survey: eight from Informaciones.Ve and only two from Noticias.Mx. Though outnumbered by third-floor daily news editors, both Mexican respondents were second-floor investigative reporters, which we speculate is an indication that, as expected, the editors did not find heterophilic recommendations useful.

Respondents' completed surveys do at least provide anecdotal hints as to the potential fruitfulness of our alternative approach to recommendations. An investigative reporter at Informaciones.Ve responded that two academic institutions recommended to her publicized online webinars and workshops of interest. Multiple journalists responded that they found news aggregators and journalists who appeared on their recommendation lists to be the most potentially valuable sources. Such accounts fit their existing pattern of following other media gatekeepers, but if they are gatekeepers to bubbles/communities with which our journalists are unfamiliar, they may nonetheless promote multiperspectivalism. One journalist specializing in politics reported noticing interesting content from an account tweeting exclusively about climate change, a subject she had not previously covered, pointing to the potential for such recommendations to expand journalists' fields of view beyond the traditional institutions of their beat in productive ways.

In a few cases that provide the best evidence of the promise of follow recommendations meant to add diversity to social media feeds, journalists found useful, newsworthy information in unexpected places. For example, one Informaciones.Ve journalist specializing in health and humanitarian issues noted with skepticism in her September survey offering her first impressions of the value of our recommendations that one account on the list, a Cuban diplomat, "only retweets things about Cuba." In the November follow-up survey, however, that same journalist reported taking an interest in information from that diplomat about COVID-19 vaccine candidates developed in Cuba for a potential Informaciones.Ve story about vaccination

(Venezuela and Cuba enjoy close ties economically and in health care).

Discussion: Toward diversified awareness systems?

Observations of *Informaciones.Ve* and *Noticias.Mx*'s online newsgathering operations illustrate that independent, online news organizations in Latin America rely heavily on Twitter as a news gathering tool. The positive but limited responses of participating journalists to heterophilic who-to-follow recommendations suggest that 1) alternative, diversity-oriented algorithmic design may fruitfully serve newsmakers, but 2) efficiency-oriented cultural and organizational routines may make some newsmakers less receptive to initiatives meant to increase multiperspectivalism.

Our ability to draw authoritative conclusions to this effect or to continue to tweak the algorithm to maximize its utility to journalists was admittedly limited by the size and participation of the studied population, as well as our computing resources and access to collect and analyze Twitter data. A further study — at a larger scale, with greater ability to access and process data, and with more sophisticated monitoring tools to measure the impact of variation in journalists' friends networks — would be required to compare the effect on news coverage of exposure to heterophilic recommendations to that of Twitter's native WTF recommendations.

Further design efforts might also be made to create tools for journalists and other Twitterers curious to engage with different perspectives, ideally with user-friendly interfaces and user-customizable criteria for producing follow recommendations. Rather than a single, one-size-fits-all algorithm, designers could hand the reins to users. Users could best find accounts to follow based on their particular needs if they could control parameters such as the number of followers, location, languages, degrees of separation, level of similarity, or verified status of candidate friend accounts. Such a user-controllable tool would potentially enhance Twitter's utility as a news gathering tool, much as advanced search tools and customizable Trends lists have.

The central intention of this pilot project was to demonstrate that alternatives can be imagined to using homophily as the uniform basis for social media relevance-ranking algorithms, including WTF recommendations. Homophily-based filter bubbles are not inevitable on social media, but depend of platform design and policies, as well as user behavior (Bozdag and van den Hoven, 2015; Bruns, 2019).

Others have recognized and critiqued social media platforms' homophilous allocation of attention. Activists and news organizations have protested against opacity, bias, or unexpected change in the way algorithms promote some contents while demoting others; investigators have attempted to audit of algorithms already in use; policy advocates have made efforts to increase the accountability and transparency of social media platform operations (Angwin, *et al.*, 2016; Sterina, 2020).

These engagements with platform governance and transparency might be complemented by work in algorithmic and user-interface design. Journalists and their advocates should ask for a seat at the table with social media platforms so that they can propose concrete design suggestions that would help allow the Internet to be used to its full potential as a multiperspectival forum. Such input is not necessarily antagonistic to the interests of the platforms themselves. Twitter in particular has a history of receptivity to input from users and outside developers, from incorporating hashtags as topic makers in its infrastructure to acquiring Tweetdeck, which was originally an independent app (Halavais, 2014).


An emphasis on personalizability of information flows is central to the business models of the most prominent of the platforms, yet when it comes to WTF recommendations, they have adopted a one-size-fits-all homophily model, with the dubious assumption that all users look for similarity in potential news friends. Twitter has allowed customizability in other features, for example whether the Trends/Whats

Happening/Explore list displays are algorithmically personalized or display general trends for a selected country. Granting users greater personalization over the degree to which they want their recommendations to be homophilous versus heterophilous and the power to apply custom filters to the recommendations they receive would be a potential selling point for advanced users including journalists. Platforms could thus promote the ability of journalists, particularly those reporting for independent media in the Global South and significantly reliant on platform-mediated connections to information sources, to inform their publics with more multiperspectival news.

In the meantime, journalists can manually expand the diversity of their online awareness systems by consciously seeking out Twitter accounts that offer unfamiliar perspectives on relevant topics. As Bradshaw (2016) argues, journalists are complicit in the limitation of their own fields of view online insofar as they “resort to the path of least resistance” and choose to return to the same familiar cast of sources over and over as they gather news online, establishing a pattern that social media platforms track and use to train the algorithms that then promote certain content and suggest certain accounts to follow. Journalists might instead consciously seek out diversity as they navigate social media, and in so doing increase the likelihood that platform algorithms will direct them outside a small circle of elite media gatekeepers.

Algorithmic design alone will not fix central problems with the journalistic gatekeeping process, though. Concerns about hoaxes, fakery, and disinformation campaigns make *Informaciones.Ve* and *Noticias.Mx* journalists understandably hesitant to trust or even devote significant resources to investigating the claims of potential sources who lack the bona fides of Twitter’s blue check and/or corroboration from a larger news organization.

Depending on their reporting culture and the speed with which they are expected to work, journalists may be unreceptive to attempts to diversify their social media feeds as inimical to efficiency. They may not have interest or time in carefully sorting through seemingly irrelevant content in the hope of uncovering hidden gems. This was likely the case with *Noticias.Mx* pressed-for-time editors. *Noticias.Mx* is, however, an interesting case and potential model: those editors’ frantic efforts generate advertising revenue and draw an audience, making it possible for the outlet’s reporters to devote resources to potentially multiperspectival investigations and to have a public impact.

Through a combination of technological and managerial innovation, news organizations can create enabling environments for at least some of their journalists to consciously increase the diversity of their social media feeds and direct their searchlights beyond their usual fields of view. If journalists are already primed and encouraged to seek out alternative perspectives, they will be more receptive to tools, such as the alternative algorithm designed in this project, meant to increase multiperspectivalism. 

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Notes

1. Lippmann, 1997, pp. 363–364.

2. Bruns, 2018, pp. 243–246; Mourão and Harlow, 2020; Saldaña, *et al.*, 2017: pp. 398–399; Kozman and Cozma, 2021, p. 1,002.

3. In September 2020, after this fieldwork was conducted, Twitter updated its Trends list to add more context to a trending word or hashtag, usually in the form of a short sentence from Twitter's curation team explaining the topic under discussion in most posts using that word or hashtag (Lee and Oppong, 2020).

4. Fishman, 1980; Gans, 2004; Shoemaker and Vos, 2009, pp. 76–96.

5. See Musgrave's (2017) discussion of the rise of "dark social" in contexts of punitive state surveillance.

6. To avoid overstating the importance of Twitter, it is worth recognizing that story ideas also come from journalists' everyday experiences as denizens of Caracas: they may witness firsthand when a blackout occurs, the service is suspended, or traffic is backed up by a street protest. See also discussion of the "enterprise channel" in news gatekeeping in Shoemaker and Vos (2009).

7. "Educational" included individual academics and educational institutions; "News Media" included journalists and news organizations; "Art/Culture/Entertainment" included artists and art institutions, athletes and sports organizations, and other cultural institutions; "Politics/State Bureaucracy" included individual politicians, political parties, government agencies, and individual bureaucrats; "Civil Society" included nongovernmental organizations, NGO workers, and rights activists who did not fit aforementioned categories; "Medical" included medical professionals and institutions; "Business" included business organizations and representatives that did not fit aforementioned categories; "Other" included individuals and institutions that did not fit aforementioned categories; "Unknown" accounts were those that could not, based on a review of profile information, recent tweets, and Web searches of user names, be classified. Some accounts were coded as belonging to multiple categories.

8. For discussion of the possibility that "in developing their own close networks of regular interactants on social media journalists are simply replacing one elite network of colleagues and sources with another in-group of privileged social media contacts," see Bruns (2018, p. 197) and Paulussen and Harder (2014).

9. For example, more than one arts and culture journalist stressed that the outlet reviewed books and Netflix prestige series rather than providing play-by-plays on telenovelas like lower-brow mainstream news outlets.

10. For cases of expressions of similar sentiment among South African journalists, see Bosch (2014).

11. The term "friend" is not commonly used to describe a "following" relationship because one user can follow another without the latter's permission (unless their tweets are "protected"), as opposed to on Facebook, where becoming "friends" requires mutual consent. However, Twitter's own Twitter's Application Programming Interface defines "friends" as "every user the specified user is following," and we adopt that technical definition for the benefit of researchers and journalists interested in collected data from Twitter API for their own analyses (Twitter, n.d.-c).

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Appendix: Steps to heterophilic account recommendations

For each "seed" account:

1. Collect all of its "friends" (*i.e.*, accounts it follows). Call these "L1 (Level 1)-Original".

2. Collect the Twitter bios (profile information) of the accounts from step 1. Keep those friends who: a) have tweeted at least 10 times; b) have tweeted at least once in the last seven days at the time of data collection; c) are not “verified” or “protected”; d) have between 100 and 5,000 followers; and, e) follow 5,000 or fewer accounts. Call these “L1”.
3. Collect all the friends of the accounts from Step 2. Filter them based on the same set of criteria laid out in step 2. Call these “L2”.
4. Calculate Outgoing Ratio (OR) scores (*i.e.*, the ratio of L2 friends of a particular L1 account who are not themselves L1 accounts) for the accounts from step 2, keeping only the top 20 accounts with the highest OR value. Call these “L1 Bridges”.
5. Collect all friends of the accounts from step 4.
6. Collect the Twitter bios (profile information) of the accounts from step 5.
7. Filter the accounts from step 6 based on the criteria laid out in step 2.
8. Collect all the friends of the accounts from step 7.
9. For every node in L2, calculate the pair-wise Similarity Score between that node and its respective L1 node (*i.e.*, the number of accounts followed by both the given L1 and L2 account), keeping only L2 nodes with a similarity score of either 0 or 1.
10. Calculate the “Bridge” accounts: Rank associated L2 nodes from Step 9 in decreasing order of the number of followers they had and then manually select the top-ranked account that listed its “home location” as a place in Mexico or Venezuela. This step is specific to our dataset and may need to change when using other datasets.

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Awareness systems or echo chambers? Latin American journalists' usage of Twitter as a news gathering tool

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