



Data Journalism in *favela*: Made by, for, and about Forgotten and Marginalized Communities

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ABSTRACT

In Brazil, inequalities are visually represented in its *favelas*. These neighborhoods are usually comprised of low-income informal settlements neglected by governments and often forgotten by mainstream media. The pervasive nature of information and communications technology (ICT) has brought new ways to produce news content in the media industry, giving voice to these communities. Thus, small, alternative, community, or non-mainstream media became a vital terrain of opposition activism. Drawing on user participation, collaboration, and data journalism theories, this article analyzes three alternative media organizations (Agência Mural, data_labe, and Favela em Pauta), which proposed producing data-driven content by, for, and about *favelas* through a mixed-method research design. Results show that four contributing factors tend to help these organizations to produce data stories despite these challenges: citizen participation, activism, collaboration, and humanizing data. The article concludes by demonstrating how elements developed in these initiatives and presents an agenda for future research.

KEYWORDS

Data journalism; *favela*; alternative media; Brazil; collaborative journalism; participatory journalism; audience participation

Introduction

The pervasive nature of information and communications technology (ICT) has brought new ways to produce news content in the media industry. Likewise, investigative reporting has been deeply challenged by new forms of conducting investigations that have emerged with data journalism (Carson and Farhall 2018). The emergence of the internet and society's datafication has made a large amount of data available to be interpreted by news outlets. Simultaneously, open data movements across the world have focused on improving the accessibility of data and metadata, and in doing so, have also contributed to the overall quality of the data to support transparency goals to serve essential social, economic, and democratic functions for the society (Knight 2015; Lewis and Usher 2013). However, data journalism has shown to be a very Western-centric practice, engaging mostly early-adopter nations in data storytelling production (Appelgren and Nygren 2014; Borges-Rey 2016).

Indeed, scholars suggest that the effects of globalization have brought specific limitations to journalism (Reese 2008). As a homogenized discipline, it would not describe

the peculiarities in the journalism practiced in each territory (Eldridge 2017). As a result, the Western models were not usually reproduced in less developed nations (Hanitzsch et al. 2019). Conversely, recent studies have shown that data journalism is flourishing outside these developed nations, becoming a global phenomenon (Mutsvaire et al. 2019). However, data journalism has developed a thriving path in the Global South, undertaking its own patterns and particularities that, at least to some extent, set it apart from the Western model (Borges-Rey 2019; Constantaras 2021).

Despite the growing awareness of data journalism in the Global South, there is evidence of unequal development of digital technologies that have conditioned media markets' evolution in these countries, further widening the gap between global and local practices. Brazil, for instance, presents a complex national reality due to continental proportions with high geographic, economic, and media ecosystem diversities (Paiva 2018). With the concentration of media ownership, the Brazilian media undermined its capability of sending the message from the periphery to the mainstream media and society, contesting prejudices and established views of these groups by ruling classes (Paiva 2018).

Data skills in Brazil are, for the most part, limited to traditional media organizations that capture a great proportion of audiences' attention (de-Lima-Santos 2019), limiting the access of peripheral actors. This is even more problematic under the circumstances of the COVID-19 pandemic, where the absence of data on specific groups, particularly marginalized ones, has resulted in severe shortfalls in the development and implementation of actions to address the needs of all. Furthermore, the complex national political and educational contexts make it extremely difficult to overcome the lack of data skills (Shields 2018). A new approach is therefore needed to increase data-driven reporting on issues relevant to the local, rural, and less educated audiences within the country (Constantaras 2021).

Moreover, in countries where there is an inequality in the distribution of power, structural inequalities emerge in the access to an extensive variety of resources, including access to mainstream platforms by marginalized societies (Levy 2018). In other words, marginalized communities are settled and persist at the margins through their economic and communicative lack of access to media. In Brazil, these inequalities are visually represented in its *favelas* (slums). These neighborhoods are usually comprised of low-income informal settlements neglected by governments. Yet, in Brazil's two major cities, *favelas* are populated by around 3.4 million inhabitants¹—about 2 million in São Paulo and another 1.4 million in Rio de Janeiro. However, data around these populations are relatively scarce.

Similarly, most of the time, individuals living in *favelas* are not heard and represented by the country's mainstream media ecology (Levy 2018). Injustice, inequality, and discrimination are ubiquitous, insidious, and overlooked in most countries, but they are especially prevalent in these areas. Peripheral (or independent) media have attempted to solve this issue by overcoming this void of data and giving tools to this audience. Therefore, small, alternative, community, or non-mainstream media is becoming more persistent and piercing in the media landscape. Conversely, these organizations were vilified and intimidated by mainstream media and governments. These outlets represent a diverse cultural realm, most often relying on audience participation (Holt et al. 2019).

Drawing on user participation, collaboration, and data journalism theories, this article analyzes three initiatives –Agência Mural, data_labe, and Favela em Pauta– that proposed

producing content by, for, and about marginalized people in *favelas*. This research uses a mixed-method that combines a devised analysis of documents followed by in-depth interviews with co-founders to understand the challenges to producing data-driven stories by these peripheral news organizations. Thus, our ultimate goal is to answer the following questions:

RQ1. How do cooperation and co-creation work as modes of production for these organizations?

RQ2. How have novel collaborative journalism efforts over the last decade, driven by the emergence of new technologies, helped these non-mainstream organizations to produce data-driven stories?

RQ3. How do these organizations produce data stories by, for, and about forgotten and marginalized communities moving away from the traditional archetypes of data journalism in the literature?

This article intends to address the practical application of data journalism for a diverse group in the Global South, in particular, focused on the *favelas* of Brazil. We theorize that this emerging journalism is conceptualized as a place of resistance and power, where voices are threatened to be silenced, but activism, creativity, and collaboration occupy the center stage in these marginalized spaces. To conclude, we expect this study to contribute to the scholarly work of data journalism, specifically those focused on the democratization of access to data by excluded and underrepresented communities, by understanding the challenges of datafication and data collection in specific groups.

Theoretical Background

Cooperation and Co-creation as Modes of Production

Continued technological transformations coupled with fundamental changes in characteristics and attitudes of the news players have profoundly affected the configuration of the media industry. This has created a long-term crisis that has translated into less advertising, collapses in share prices, and reductions in consumption that changed the traditional business models of media organizations. Hence, media organizations have found themselves under intense pressure to maximize their efficiency and seek new forms to relate with the public (Franklin 2014).

Through different forms of media innovations, such as product, process, paradigmatic, and social, news outlets embraced different degrees of novelty amid these transformations. The type of communication commonly found in “old” media, one-to-many, in which journalists were information gatekeepers, changed toward a model where information is generated from and received by multiple sources, the many-to-many system (Belair-Gagnon et al. 2019). Consequently, journalistic work has changed to include new practices, routines, norms, and strategies that shape “new” forms of news production. Among them, media outlets found that audience participation constitutes an essential characteristic of digital journalism (Loosen and Schmidt 2012; Singer et al. 2011).

Previous studies have argued that the rise in the so-called network society (Deuze and Witschge 2018; Van der Haak et al. 2012) is a consequence of technological advances and

the emergence of the internet. Described as a community in which the social structures are “made up of networks powered by micro-electronics-based information and communications technologies” (Castells 2005, 3), the network society is characterized by horizontality and interaction across all levels. Thus, news media organizations transform their production model toward a network model that collaboratively operates with local, national, and international communities. In other words, the media ecosystem is shifting from one dynamic-steady state to a more cooperative mode, in which the processes of production, decision-making, and leadership are shared to foster collaborative innovations. Consequently, in a network society, the boundaries are unknown, influencing the way that media organizations interact with their audiences.

Historically, the remarkable proliferation of peer-to-peer (P2P) networks democratized access to information and resources toward a collaborative economy, which became fundamental to the rethinking of news production. This was only possible thanks to technological means that enabled features for audience participation, changing from a vertical paradigm of a “one-to-many” message to a “many-to-many” horizontal flow. In this way, not only have the boundaries between journalists and their audience changed to the point of affecting the control and power over the news production process (Engelke 2019), but part of the control has also shifted from journalists to technologists who deploy these technological tools (Loosen and Schmidt 2012).

In this context, scholars have defined audience participation in journalism through a series of related terms, such as participatory journalism (Singer et al. 2011), citizen journalism (Lasica 2003), collaborative journalism (Sambrook 2018), networked journalism (Van der Haak et al. 2012), peer-to-peer journalism (Bruns 2016), open-source journalism (Deuze 2001) and, most recently, engagement journalism (Schmidt and Lawrence 2020). These characterizations have different foci, but their essences are equivalent: the inclusion of the audience into the news process.

This collective knowledge found its basis in other dimensions, which includes new practices of co-creation, co-production, cross-checking, and further forms of cooperation in distinct parts of the news industry’s value chain. However, even with a great production of collective knowledge and co-creation derived in a network society, the information still requires interpretation (Van der Haak et al. 2012). On the one hand, inaccurate information shared by the audience could potentially result in risks to public safety, harassment, and violence (Lasica 2003; Singer et al. 2011). On the other hand, it makes essential the role of journalists to guarantee the quality of news outputs, thus, ensuring editorial and production success. The values of news media, such as perseverance, public pressure, and legal support, are crucial to preserving and protecting democracies (Downie and Schudson 2009; Kperogi 2011).

In spite of this limitation, all these forms of co-creation and cooperation in news production have broken the institutional barrier to achieving a more collaborative mindset in the news ecosystem. The collaboration created a culture across different news media organizations and nations to tackle larger issues and problems that no single group could tackle on their own, compensating for the lack of resources and staff shortages (Heft 2021). Therefore, these cultural revolutions and changes of mindset enabled journalism to encapsulate the different forms that participation and engagement in journalism might take, leading the way toward transnational cooperation within and outside of

the industry that turned into powerful global means of communicating the local, national, and global stories (Heft et al. 2019).

The Emergence of Collaborative Journalism Efforts

185 There is an agreement that collaboration has always been part of journalism (Sambrook 2018). However, recent theoretical developments have revealed that collaborative journalism has become more common and adopted in this new era due to the ubiquity of the internet, the digitalization of society, and globalization (Serna 2018). Therefore, the
190 current cooperative efforts are substantially distinct from other kinds of collaboration performed before. The main argument is that collaborative work in newsrooms empowered journalists to do quality work, even while facing myriad challenges—for instance, drains on resources and staff (Carson and Farhall 2018).

195 Most of the recent outstanding investigative journalism projects worldwide were based on cooperation (Buzenberg 2015). Those investigations, such as the Panama Papers, Paradise Papers, and Swiss Leaks, have produced long-lasting global effects that can still be seen in society today, years after their release (Graves and Shabbir 2019; Konow-Lund 2019). For example, the Panama Papers are considered one of the
200 most successful collaborative efforts ever performed in journalism and would never happen in the competitive media model. The investigation was possible thanks to the work of more than 300 journalists from more than 100 countries, coordinated by the International Consortium of Investigative Journalists (ICIJ), who dug into the enormous amount of data leaked from the Panamanian law firm Mossack Fonseca by an anonymous source, leading to prosecution and convictions of multiple defendants around the globe
205 (Lück and Schultz 2019).

Aside from these global efforts, there are other highly relevant examples of collaborative projects in journalism at the regional, national, and local levels. In particular, Latin American collaborative projects have been increasing in scale and scope. As a result, these projects have been recognized with awards from well-respected organizations,
210 such as the Lava Jato case (de-Lima-Santos and Mesquita 2021). On the other hand, these projects still face challenges to integrate into journalistic communities, mainly hampered by digital literacy barriers and structural factors (Cueva Chacón and Saldaña 2020).

215 Meanwhile, economic struggles impacting the media industry in Latin America have caused difficulties for traditional investigative journalism, with many such teams having been diminished or disbanded. Thus, investigative journalism has turned increasingly to collaborative journalism to create and nurture a culture of intensive fact-based reporting and powerful storytelling. This has created public awareness about the dangers of corruption and violence faced in Latin America (de-Lima-Santos and Mesquita 2021).

220 Nevertheless, a prior study has warned that even with this cooperation between journalists and news outlets, there is an ongoing decline in the number of investigative stories that journalists are producing (Carson and Farhall 2018). Arguably, this might be explained by a single-topic collaboration and that these efforts tend to use all journalists' time in a unique story. It could be argued that this is partially due to the very nature of investigations being more complex today than ever before. Even with advanced technologies, investigative journalism is time-consuming and more complex, due to big data.
225 Thus, the very nature of the data and information has made it impossible for journalists

to work alone (Sambrook 2018). Beyond that, collaborative projects are, by their nature, networked structures, which means that there are complex power structures and interaction patterns, limiting access to journalists outside these networks and empowering the organizations on the top (Alfter and Căndea 2019).

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Between ~~Data Journalism~~ and ~~Data Activism~~

The ever-growing availability of data, processing power and automation of processes are phenomena that have their origins in the datafication and digitalization of society (Kitchin 2014). Consequently, journalism has entered into a brand-new era of technological development, especially thanks to data-driven reporting. Data journalism has risen in the news industry as a new style of engaging audiences both in print and digital media. The term gained a reputation in the 2010s, after the launch of *The Guardian's Datablog*, but its origin lies in the work of the US journalist Philip Meyer (de-Lima-Santos et al. 2020). He used statistical and quantitative methods to investigate journalistic questions, which was known as CAR, an acronym for computer-assisted reporting (Coddington 2015). With the evolution of computer language and fields, data journalism became a fad in the media industry, which saw new ways to tell stories and found new forms to engage with audiences (Hermida and Young 2019).

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A major milestone in the data journalism industry was the Panama Papers project, which empowered a new kind of journalism using data and collaboration. These collaborative efforts helped to shape journalism practices in two ways: first, with improvements in data collection and analysis techniques, and second, by developing a culture of sharing and collaboration that was not common in news outlets, mainly in investigative journalism where they operate as packs of lonely wolves (Carson and Farhall 2018; Lück and Schultz 2019).

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In a time of transformation, other newsrooms expanded their practice beyond these significant dataset leaks toward crowdsourcing in data projects. Prior research suggests that digital developments have brought benefits to investigative journalism in Latin America, which involves the public in different phases of the news cycle (Palomo et al. 2019). Hence, newsrooms found ways to deploy data-driven news products that were favorable to improve audience engagement and were capable of echoing their complex realities.

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The persistent unequal levels of development and access to technologies in the Global South (Jamil 2019), led news organizations in Latin America to innovate and pave their own way, often featuring their unique characteristics. An example of this is the role that non-profit and civic tech organizations had in data democratization and bridging the knowledge gap to transform the news ecosystem. In Latin America, these initiatives, such as the local chapters of the School of Data, the ICFJ (International Center for Journalists), the ABRAJI (Brazilian Investigative Journalism Association), and the local offices of the Open Knowledge Foundation and W3C (the World Wide Web Consortium), were responsible for the formation of a community of data-driven storytellers.

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Furthermore, other open data groups across the region have focused on improving data and metadata's accessibility, and in doing so, have also contributed to the overall quality of the data to support transparency goals and to serve essential social, economic, and democratic functions for society (Lewis and Usher 2013). Over the years, this

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commitment and dedication have been recognized by the increasing amount of data journalism awards received by news organizations across Latin America (de-Lima-Santos and Mesquita 2021).

275 Looking in particular to Brazil, prior research suggested that alternative or non-mainstream media represent one of the major data journalism producers in the country (de-Lima-Santos 2019). Some of these initiatives are built their business strategies on three distinct pillars: data justice, data decolonization, and data activism movements. In a datafied world, data justice examines the tangled link between the way people are made visible, represented, and treated by highlighting the politics and impacts of data-driven processes in society. Concerning the rising availability of digital data as a result of economic and human development, Taylor (2017) argued that data “has both political and practical implications for the way people are seen and treated by the state and by the private sector” (1). This is especially true for marginalized groups, like those living in *favelas* in Brazil, which did not have space in the country’s media ecology and are usually forgotten in the statistics (Levy 2018).

280 Hence, data justice has also raised the call for other movements. The movement of data decolonization, for instance, is seen as part of the fight for data justice. Based on the “opposite” concept of data colonization, it can be explained through the lens of colonialism. In the same vein that colonization entails predatory extraction practices, data colonization performs this exploitation through computational and quantification methods. Decolonization is the process of deconstructing colonial ideologies of the superiority and privilege of Western society (Coudry and Mejias 2019).

290 Thus, data colonialism is understood by capitalism’s current dependence on this new type of appropriation based on data and digital infrastructures (Coudry and Mejias 2019). As colonialism has dominated economic relations, especially between the Western and the Southern worlds, and served as an impetus for the industrial revolution, data might also be used to perpetuate these forms of domination and exploitation of this “new” or renovated form of capitalism. Likewise, the media ecosystem across Brazil is built on the exploitation of big conglomerates and “clientelism” culture (Hallin and Papathanassopoulos 2002). Therefore, there is a need for data decolonizing in Brazil, as a tool to fight against biased data that is commonly found in the Global South as a byproduct of Western democracies.

300 This leads to another movement that rejects the logic of “universalism” (see Milan and Treré 2019) to embrace a non-Western viewpoint of data usage. This field follows closely the paradigm of possibilities for the South’s epistemological context, in which the core and the periphery should think and act more as a whole rather than as different parts (Milan and Treré 2019). In this sense, data activism movements challenge and resist existing power relations. They attempt to take the socio-technical power of data from the control of dominant groups to foster social and economic fairness. In doing so, activists are drawing on data as a tool to give means for social transformation. Therefore, we contend that data activism is about data justice, as these groups act within “the trans-individual milieu to deconstruct, create, and realign specific articulations of the social and the technical in order to enact change” (Renzi and Langlois 2015, 208).

310 In fact, the alternative media works as a source of activism that helps to understand society’s historical and current structures. These organizations fundamentally change the way of thinking about datafication by giving voice and opportunities for developing

novel forms of handling data from the margins. Thus, alternative media challenge the domination carried out through the unintended use of data and counteract the asymmetries in terms of data usage and distribution, mainly concerning minorities. These new forms of doing journalism help to move toward a world where data is provided and managed by marginalized peoples for the improvement of their lives, offering tools for “(re)creating conditions of possibility for counter-imaginaries and social justice claims to emerge” (Dencik et al. 2019, 875). Conversely, scholarly literature has stressed the negative aspects of alternative media, such as the absence of professionalism, financial and organizational uncertainty, and low levels of technological resources and know-how. Hence, these organizations have also fragmented audiences and made it difficult to reach consumers efficiently (Holt et al. 2019).

In this article, we discuss three cases of Brazilian alternative media that are deploying data journalism in marginalized communities, which governments have historically failed to serve equitably. In doing so, these organizations serve as an inspiration to all committed to making a difference in the world and fulfilling local needs caused by a shortage of data and media content.

Methodology

The literature on data journalism has typically focused on early-adopter nations and mainstream media organizations (Young et al. 2018). More recently, this has expanded to news organizations based in the Global South, but has yet been limited to organizations with national reach. This article addresses the use of data in news reporting by, for, and about marginalized people, a focus that has thus far been lacking in the scientific literature.

Therefore, this study looks at three organizations designed specifically to write stories about and for this population: Agência Mural, data_labe, and Favela em Pauta. We understand that by pursuing this study, we may reveal the process behind the production of data stories about and for marginalized groups that challenge the status quo and give voice to people who have traditionally been silenced. By reporting the challenges that these organizations face in producing data stories, this investigation sheds light on the possibilities to engage peripheral audiences in a type of journalism that involves analyzing and explaining key issues through data.

A mixed-method research design was applied in this study through a two-step approach. First, we specifically devised a document analysis, which includes reviewing public speeches, white papers, technical reports, point-of-view papers, websites, magazine essays, and promotional marketing pieces. These documents were then coded to serve as the basis for our interview guide. Four topics relevant to data journalism emerged in this analysis: news production, collaboration, audience participation, and funding.

Second, semi-structured interviews were conducted with co-founders of these initiatives, as shown in Table 1. It is worth mentioning that one of the main limitations of this

Table 1. Interviewees and organizations.

Code	News Organizations	Headquarter	Positions	Gender
R1	Agência Mural	São Paulo	Co-Founder and Director	Male
R2	data_labe	Rio de Janeiro	Co-Founder and Coordinator	Male
R3	Favela em Pauta	Rio de Janeiro	Co-Founder and Coordinator	Female

study was the reduced number of players in this niche. However, this is a phenomenon that is still not totally unfolded. There is an increasing interest in data journalism and marginalized communities in the region, as we could see by the number of grants and funds offered by philanthropic institutions and big tech companies. Although the number of organizations covered by this study might seem limited, it is representative because the number of players is reduced, and their staff is few.

Interviews were carried out in Portuguese between November and December 2020 via Google Meets and WhatsApp. The latter app was chosen due to its popularity in the country. On average, interviews lasted 60 min. All interviews were transcribed verbatim and analyzed by a thematic analysis approach to identify categories and themes, a common method applied in qualitative data analysis to identify, analyze, organize, describe, and report on themes that emerge within a data set (Braun and Clarke 2006). We argue that thematic analysis is a useful method to be applied here, as the authors want to explore the distinct perspectives of participants and highlight similarities or differences to generate unanticipated insights (Nowell et al. 2017). This local empirical evidence was then contextualized with the global and local theoretical frameworks of this study.

Findings

Agência Mural: From Citizen Journalism to FOI Culture

In the early 2010s, the Agência Mural started to become a hub of information for citizens living in the peripheral areas of the city of São Paulo. This project was conceived after a training course about citizen journalism promoted by the journalist Bruno Garcez when he was a fellow at the International Center for Journalists (ICFJ). His idea was to offer a “view from the inside” of this peripheral area, which was not covered in the traditional media. After three rounds of training courses, some participants decided to create an organization that initially served as a blog about their neighborhoods hosted in the portal of the *Folha de São Paulo*, a legacy media outlet.²

The blog has still existed in the legacy media, but since its foundation in November 2010, the Agência Mural has transitioned into a ground-breaking alternative media organization. In 2015, the institution shifted gears into an agency that provides content not only to *Folha* but also to other news media organizations interested in diversifying their voices and presenting content from marginalized voices.

Drawing on the idea of citizen journalism, the organization has always trained and brought to the newsroom new generations of citizen-journalists, who contribute to the organizational ethos by bringing new ideas and novel forms of producing content. According to R1, the freedom of information (FOI) culture that the organization has in present days was in part due to a former journalist who was very interested in the topic and usually evangelized her peers about its importance. For example, she helped to train newcomers in the process of translating FOI legislation into practice. Her persistence resulted in the data-driven news product 32xSP, which for the organization “was its first major project, and it even precedes the Mural news portal itself” (R1). This project was for R1 the first experience working with data journalism while he was a reporter for this special project.

Since 2016, 32xSP has provided the public with daily news concerning the 32 regional administrative entities of São Paulo.³ In it, the organization covers information about the citizens' viewpoints on topics, such as inequality, access to public services, and infrastructure, among others, mostly relying on FOI requests, subject to data journalistic scrutiny. The idea behind this is "to bring public administration a little closer to the citizens" through local journalism (R1). As an example, 32xSP used data to explain limitations in mobility observed in residents of peripheral areas. With these data, Agência Mural "could understand the mobility issues around the city. This includes not only how many hours are spent [on public transportation] but also other aspects related to it, such as death by a bicycle accident. This shows a little bit of our DNA" (R1).

To make 32xSP possible, Agência Mural joined forces with Rede Nossa São Paulo (RNSP), a civil society organization, to coordinate this project with financial support from the Ford Foundation. In doing so, 32xSP gained attention from other traditional media channels. Before the pandemic, the organization had a space on the newscast of the television network Band, entitled "Giro da Quebrada,"⁴ in which local journalists tell stories about their communities in the video.

In the same vein, the news radio network CBN established a partnership with Agência Mural for content dedicated to reporting on these 32 regional areas during the 2020 Brazilian municipal elections. "We did an 'elucidative portrait' of the city through 32 episodes, one for each of the regional administrative units. This was made before the mayoral debate, which brought an x-ray of the city [for the voters], showing the inequalities of each region using data" (R1). This experience of reporting data on radio was important for R1 because he saw the new opportunities for telling data stories beyond the digital. "Partnering with CBN was very important because we managed to bring data in another form to the public, to the radio, by speaking and presenting these figures in a very explicit way" (R1). For example, R1 mentioned that in the radio newscast, it was common to give voice to the people affected by a public policy to illustrate the data, as a way to humanize the data (Kostelnick 2019).

This experience gave them tools to develop other projects that brought innovative ways to tell stories. In collaboration with Énois, a Brazilian NGO dedicated to changing the communication market through diversity and inclusion of teenagers from *favelas*, they produced a series of news stories that "used a sound-equipped car to play the podcast 'Em Quarentena,' especially during the elections" (R1). Notably, the podcast was a product that was financed in its first season by the Institute Unibanco, an endowment fund dedicated to supporting educational projects. The second season had the support of the Embassy and Consulates of the United States in Brazil.

Funds from philanthropic foundations are the main revenue source to develop these projects and the organization itself. Therefore, to overcome the lack of staff and resources, cooperation and partnerships with other organizations become the operational norm for Agência Mural. This result correlates well with previous studies where collaboration emerges among stakeholders aligned in terms of interests (Franklin 2014; Konow-Lund 2019).

Data_Labe: Cqcozap Between Data Journalism and Data Activism

Based in Maré, a neighborhood grouping of several *favelas* in the north of Rio de Janeiro, data_labe defines itself as a laboratory of data and narratives about this region. The

455 initiative was founded in 2015 in the dependencies of Observatório de Favelas, a civil society organization and research institution where R2 worked at the time. His interest in data and technology spurred him, along with a friend, to found the laboratory in partnership with the School of Data, a project coordinated by the Open Knowledge Foundation. The first stage included the recruitment of five young people from different *favelas* who would look at data from their community's perspective. After this experience, the organization has undergone a lengthy restructuring process. Since 2018, the organization is considered a licensed association that, as of December 2020, has 18 members.

460 During this transformation process, they saw the importance of having members from a diverse range of backgrounds and from distinct regions of Rio de Janeiro –according to R2, only five currently live in Maré. By combining the experiences, these professionals can enhance their audience's information intake, which includes topics such as race, gender, sexuality, environmental justice, and the right to communication, all from the perspective of *favelas*.

465 The organization is assembled around three axes: journalism, training and monitoring, and citizen generation of data. One project that unites all these features is CocoZap,⁵ a data project developed in association with Casa Fluminense, a non-profit organization. This collaboration was formed to compete for the DataShift Community Seed Funding Challenge proposed by CIVICUS, a global alliance of civil society organizations and activists. The challenge was based on developing a project guided by principles of citizen-generated data (CGD) and sustainable development goals (SDGs), which is exemplified by CocoZap, a channel for reporting, debate, and proposals for basic sanitation. "This project involves the generation of data in Maré, where we collect and monitor public policies from the territory perspective" (R2).

470 During 2016, the team received the DataShift prize that was used exclusively for studying, mapping, and collecting data related to basic sanitation in Rio de Janeiro. One year later, the organization raised funds to launch the data project. Using a WhatsApp number to collect data from citizens of two *favelas* from Maré, the organization gave the community a critical role in encouraging people to report violations of the health law. By including the audience in the news production, data_labe includes mobilization, activism, and training in its workflow. In the dissemination of this WhatsApp number, the team went to the streets in Maré to explain the project and its goals. According to R2, people tend to think that by sending photos and information about places where sanitation is lacking, the government will take action. "Most people have a very high expectation of solving the problem, so it requires a lot of conversation about the data culture. The public needs to understand that they only make a complaint that goes to a database. It will not solve the problem, unfortunately" (R2).

480 Thus, data_labe found that the engagement was shallow because people did not understand the role of audiences' contributions. Consequently, the team found that "this biggest challenge" was to mobilize people and found a way to do it "through workshops, being present at popular health clinics, schools, beyond the streets" (R2). However, the COVID-19 pandemic outbreak made these approaches impossible, and during 2020, a new strategy was required. Virtual meetings were designed, but these proved a challenge because "the engagement is very low" (R2) due to the lack of the population's technological literacy. Despite these challenges, the public contributed to CocoZap, which reached 490 more than 50 points regarding basic sanitation issues. These points in the map have also 495

turned into stories. As R2 indicated, the idea is to expand to other forms of mobilization. For example, local influences were used to explain and disseminate the importance of this data project in 2020. Also, a meeting was held with “residents and environmental activists that live in Maré to produce a better articulation with politics about the theme” (R2). In line with previous studies, data activism has political and practical implications for the way people are seen and treated by the state (Taylor 2017), echoing the activities promoted by data_labe.

Furthermore, data_labe is always producing stories and crossing datasets to shed light on issues relevant to these communities. “We look at a specific database and cross it with others to find common denominators between two or three datasets; as a result, we can look at a context that has to do with topics that are important to us, such as territory, gender, and race” (R2). In doing so, R2 bemoaned the difficulty that was found during the COVID-19 pandemic, in which the government did not have enough information about the territory, especially because the favelas are still designated as “informal” communities, and “this racist [informal] name that ends up giving a very unreal portrait of the reality [of the area] by not having actual data. We go through this a lot in Maré, which is a gigantic neighborhood, with 140,000 people but which still has half of the zip codes linked to Bonsucesso, a peripheral neighborhood but not a *favela*” (R2).

It was possible to collect COVID-19 data by associating with other organizations distributing basic food supplies and goods baskets to people in need. In this process, these different organizations could survey the population about symptoms and any confirmed cases in their families. In fact, this finding echoes with the principles of decolonizing data of deconstructing ideologies of data about only superiority and privilege of people (Couldry and Mejias 2019).

At the same time, this shows another feature of data_labe. Similar to Agência Mural, collaboration and partnerships are essential to its success. An example of this is the cooperation with the social organization Olabi to promote workshops for elderly people, improving their data literacy skills. In the same vein, the alliances with other organizations allow for the promotion of their work, like publication in cooperation with a local newspaper *Maré de Notícias*. Also, these collaborations, in some cases, serve as revenue streams, such as the publication of content with the digital native outlets UOL and Elástica, which works “to supplement the funds from philanthropic foundations that represent the majority of our income” (R2). According to R2, these funds were increased during the pandemic, which permitted data_labe to deploy more projects, although they usually focus on health crisis issues.

Favela em Pauta: The Pandemic Outbreak as an Opportunity for Data Journalism

Favela em Pauta was founded in 2017 by three journalists who are residents of *favelas* in Rio de Janeiro. Coming from the three major shantytowns neighborhoods—Complexo do Alemão, Rocinha, and Maré—these practitioners met through a network built after an experiment produced by the British news outlet, *The Guardian*, during the 2016 Olympics. This experience gave them the perception that there was a need to build an alternative media outlet where the “journalism that comes from the *favelas* but does not necessarily

focus on speaking or informing these communities” (R3). Thus, they frame the initiative on three strategic pillars: content, actions, and network.

In the first pillar, *Favela em Pauta* has the mission to cover topics about politics, society, and culture under the lens of the *favela*. In doing so, the team always uses “freedom of access law to request information” (R3) when there is potential to bring new eyes from data to the story. An example is a story about the number of nurseries that could be found around *favelas* in Rio de Janeiro, which was produced using FOI requests. According to R3, *Favela em Pauta* covers a broad range of topics, but it is “very inspired by data_labe’s work that knows how to use data on its stories” (R3).

Furthermore, R3 argues that she feels like a “data repository, with all the experiences that I lived [in Complexo do Alemão]. For instance, when I was a kid and I was running out of shootings” (R3). For all these experiences in life, R3 sees the importance of data journalism in these peripheral communities to tell the real stories. “The perception was that data, even public data, when interpreted, was not interpreted from the perspective of *favelas*. [We aim to bring] elements that correspond to this desire, to respond and listen to this public opinion” (R3). According to our respondents, because everyone is also involved in other activities, it is hard to dedicate time to produce data stories. Still, they see this as a possible path for the journalism that they produce.

Consequently, it has supplied an impetus to launch the #MapaCoronaNasPeriferias (“#CoronavirusMapInThePeripheries”), its biggest project using data so far. Part of the organization’s second pillar, actions, this initiative united journalists from all regions of the country to report COVID-19 actions that were happening in *favelas* and peripheral neighborhoods. In this way, the organization could solicit data to give reporting on the pandemic a new dimension and also serve as a channel to promote volunteering and charity activities. This project was possible due to a partnership with Twitter and Institute Marielle Franco, a non-profit organization dedicated to developing projects for black women, LGBTQIA+, and peripheral communities. Using Google tools, the platform received data from more than 550 projects tackling the COVID-19 effects, which covered 645 peripheral neighborhoods.⁶ By mapping this, the initiative could write stories with journalists from distinct organizations to shed light on the issues brought by the pandemic to peripheral communities.

Collaboration is a core component of *Favela em Pauta*’s business models. When we asked R3 about other collaborative projects involving data, she mentioned that *Favela em Pauta* has also worked with fact-checking organizations to debunk content disseminated in *favelas*. The content has been published in partnership with Comprova and Agência Lupa, two important fact-checking initiatives in Brazil. Other cooperative efforts happen with the production of stories through grants, like the series published in association with Colabora. Thus, these collaborative efforts associated with foundation grants are part of the revenue strategy that has been put in place by *Favela em Pauta*.

These alliances are also translated into networks, the third pillar of the initiative. In particular, the first training promoted by R3, before the launch of *Favela em Pauta*, in association with the Brazilian Investigative Journalism Association (Abraji - Associação Brasileira de Jornalismo Investigativo, in Portuguese) boosted these collaborations. She built a network with journalists from low-income communities and peripheral areas around the country over the last decade, which “exchanges experiences, information, resources,

and tools” (R3). This network also serves to promote actions in different communities and grants from foundations that help most organizations finance their activities.

Despite the challenges, many journalists who work at Favela em Pauta “do not perceive themselves working in media companies because they do not include us. Because if you are a journalist and live in a *favela*, you are necessarily an activist. You are usually connected to that space and see the need to talk about specific topics” (R3). Thus, these journalists imbue themselves with the mission of reporting and giving voice to the voiceless.

Discussion and Conclusion

In summary, the findings have demonstrated that data journalism is not restricted to mainstream media. These alternative media, even with few resources and a small staff, have found ways to deploy data storytelling in news reporting. This result ties well with previous studies that detect a dichotomy in data journalism between its popularization and promotion, especially in Western societies, and its hurdles and limitations, particularly for the Global South (Constantaras 2021; Jamil 2019).

Furthermore, inequality, injustice, and discrimination are insidious in the Global South. Thus, data are scarce about marginalized people from official sources, which can also bring risks of perpetuating historical inequalities. This has been a challenge for the three organizations studied here, but it did not prevent them from succeeding as upstart journalist-activists. Looking to answer the research questions posed by this study, we can argue that four contributing factors tend to help these organizations produce data stories despite these challenges: citizen participation, activism, collaboration, and humanizing data.

First, citizen participation takes many forms in these organizations. Two primary examples include the production of data for news stories or the illustration of the data behind the stories, as mentioned by R1. CocoZap is an interesting example of citizen participation, in which these marginalized people produce the data by, for, and about their communities. In the same vein, #MapaCoronaNasPeriferias mapped projects that tackled the effects of COVID-19 in peripheral communities. These two projects illustrate some of the decolonization practices that deconstruct ideologies imposed by producing data only from a superior and privileged perspective (Couldry and Mejias 2019). In a case where no data was forthcoming from public authorities about, for instance, public health in marginalized communities, these organizations found ways to supplement the data available for use in compiling information from citizens using technological means, such as WhatsApp or Google Forms (both belonging to big tech companies).

Thus, this data serves to inform decision-makers to make better policy decisions, which is a form of data activism (Taylor 2017), the second factor. Activism takes many forms in these organizations. An example comes from data reporting, which also covers the lack of answers after filing FOI requests. Furthermore, data that is received from official sources often lacks specific information on data, such as gender and race. As bemoaned by the interviewees, the country has been under a regime that is considered authoritarian since 2016. Consequently, the government tends to minimize and distort information to undermine the press and civil society. Using techniques like excessive or unnecessary secrecy of documents or alleging that due to the pandemic, it is impossible to process

data, our interviews determined that this government has impaired Brazil's transparency and data access (R1, R2, R3).

635 Another form of activism mentioned by the interviewees is that, although their organizations might not be considered part of the mainstream media, they are certainly pressuring the authorities and policy-makers onto a better representation and fighting against their lower representative in the public sphere using data decolonization and data activism (Couldry and Mejias 2019). These actions include collaboration and cooperation between organizations from different perspectives, such as civil society, the public, and governments. In fact, this strategy reveals that partnering leads to a combination of
640 resources and ideas in unique ways that promote their ability to reach a wider public and create awareness of this population that is often forgotten. This leads us to the third point, collaboration.

645 Collaboration is widely spread in the organizations' culture and takes many shapes, ranging from cooperation with civic-tech organizations and news organizations to partnerships with tech companies. To illustrate this, data_labe collaborates with *Maré de Notícias* (local newspaper), while Agência Mural broadcasted their project 32xSP on CBN (radio station) and Band (television channel). Favela em Pauta has also partnered with fact-checking organizations, such as Agência Lupa and Comprova. Therefore, there is
650 no discrimination or dominant form of cooperation; the important denominator is a potential partner's respect for their organizational values, as mentioned by the interviewees.

Moreover, these alliances represent, in some cases, revenue sources that allow these organizations to produce data projects and sustain their business models. However, novel revenue strategies will be imperative for these organizations to evolve to
655 support their business's independence. In the meantime, funds from foundations, such as Open Society and the Ford Foundation, and grants from big tech companies, such as Facebook and Twitter, are vital to the success of these organizations (Harlow 2020). Additionally, much financial support came from COVID-19 emergency grants. This particular phenomenon led us to think about the possible editorial implications and whether the
660 mission of these organizations would ever be compromised to align to grant proposals in order to access financial support. Furthermore, these grants are limited to a predefined period, inviting the question as to how these organizations will support their data projects in the long run.

665 Last, the fourth strategy is humanizing data. As data journalism requires specialized skillsets –such as data, statistical, and visual literacies– that are not common to most people, these organizations endeavor to produce data stories that are more “digestible” to anyone. This is evidenced by making simple use of figures to illustrate people's stories. Another approach is seen through what we call “data meets the streets,” in which these
670 practitioners speak directly to the population in the streets to explain their data projects and the goals of their work, and in some cases, the methods behind it. Furthermore, using sound-equipped cars or broadcasting these stories via radio help to reach people who do not have smartphones or the internet, echoing the findings of the importance of humanizing data (Kostelnick 2019).

675 We can conclude that although there is an increasing movement toward the adoption of more data-driven narratives in these alternative media organizations, it is still a challenge for them. Despite their approaches, they yet feel unprepared to take advantage

of data journalism in its full capacity. Limitations to their functioning include a lack of training, specialized personnel, and money, echoing other studies' findings (de-Lima-Santos et al. 2020; Jamil 2019). On the other hand, they advocate by bringing more data from, by, and for these communities that are often marginalized by the authorities and the mainstream media.

From another perspective, this study presents limitations regarding the perspective of the organization's co-founders. It is, therefore, an initial approach to the subject. Thus, we leave out of the conversation people who are consuming the content and projects produced by the organizations (audiences' perspective) as well as the relationship between public power and such outlets. Future studies could fruitfully explore these issues. Additionally, this study looked at these organizations when they had more financial incentives due to the COVID-19 emergency grants. It will be important that future research investigate how these grants influence the data projects that these initiatives are deploying.

In addition, ongoing data colonialism and the lack of professional training to deal with information technologies result in another limitation of this study. As no technology is free from political or ideological biases, the fact that alternative efforts to produce data journalism use these tools and financial resources owned by large technology companies, whose business models benefit on data collection of users, poses a dilemma that would be worth discussing in future work. We also believe that apart from looking for marginalized groups in Brazil, further study is certainly required to look at other projects focused on low-income communities around the world.

In conclusion, we were able, despite the limitations discussed, to highlight some relevant aspects of data journalism practices on marginalized communities and organizations and to relate these topics to existing literature. Our study contributes to scholarly literature by positioning itself in a spectrum of de-Westernization epistemologies and shedding light on experiences and realities of specific groups that were not discussed before. The main achievement demonstrates how these organizations are deploying data practices in marginalized communities as a tool to advocate for and give voice to this underserved public.

Notes

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2. Agência Mural's blog online website of *Folha de S.Paulo*. Retrieved from https://mural.blogfolha.uol.com.br/projeto_mural/. Accessed in January 2021.
3. 32XSP. <https://32xsp.org.br/>. Accessed in February 2021.
4. "Da quebrada" is a slang that means something around "alternative place," also means "in the corner", but, in general, is used in the context of slums of peripheral areas. Giro da Quebrada. Retrieved from <https://www.agenciamural.org.br/parcerias/giro-da-quebrada-band-sp/>. Accessed in January 2021.

5. CocoZap is a project of mapping, incidence and citizen participation on basic sanitation in Maré, a Rio's *favela*. <https://cocozap.datalabe.org/>. Accessed in February 2021.
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Disclosure Statement

Q3 No potential conflict of interest was reported by the author(s).

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Funding

Q2 Q1 This project is funded by the European Union's Horizon 2020 research and innovation program under the Marie Skłodowska Curie grant agreement No 765140.

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