Original Research Article

Folk theories of algorithmic recommendations on Spotify: Enacting data assemblages in the global South

Ignacio Siles[1] [ORCID], Andrés Segura-Castillo[2], Ricardo Solís[3] and Mónica Sancho[3]

Abstract

This paper examines folk theories of algorithmic recommendations on Spotify in order to make visible the cultural specificities of data assemblages in the global South. The study was conducted in Costa Rica and draws on triangulated data from 30 interviews, 4 focus groups with 22 users, and the study of "rich pictures" made by individuals to graphically represent their understanding of algorithmic recommendations. We found two main folk theories: one that personifies Spotify (and conceives of it as a social being that provides recommendations thanks to surveillance) and another one that envisions it as a system full of resources (and a computational machine that offers an individualized musical experience through the appropriate kind of "training"). Whereas the first theory emphasizes local conceptions of social relations to make sense of algorithms, the second one stresses the role of algorithms in providing a global experience of music and technology. We analyze why people espouse either one of these theories (or both) and how these theories provide users with resources to enact different modalities of power and resistance in relation to recommendation algorithms. We argue that folk theories thus offer a productive way to broaden understanding of what agency means in relation to algorithms.

Keywords

Agency, algorithms, audience research, folk theories, Latin America, music streaming services, surveillance

Algorithmic recommendations are key in contemporary processes of surveillance and anticipatory governance. Scholars have envisioned algorithms as technologies of "ideological control" (Cohn, 2019) and crucial pieces in the production of "data subjects" (Prey, 2018). In both academic and journalistic discourse, there is a fundamental concern that "algorithms are everywhere" and that they are "ruling our lives," as the writer of a recent article put it in *Wired* magazine (Turk, 2019).

Critical data studies have helped situate the study of algorithms within the operation of "data assemblages" (Kitchin and Lauriault, 2014), that is, sociotechnical networks in which "systems of thought, forms of knowledge, finance, political economy, governmentalities and legalities, materialities and infrastructures, practices, organisations and institutions, subjectivities and communities, places, and marketplaces" mutually constitute each other (Kitchin, 2014: 20). Thus, modes of thinking, rationalities, and theories have been a concern for critical data scholars. However, the study of

these systems of thought has focused primarily on the production of data. Concurring with Milan and Treré (2019), there has been relative disproportionate "attention to technical aspects to the detriment of appropriations, practices, and the human agency around and behind data" (p. 327). From this perspective, an investigation of data assemblages around issues like dataveillance and prediction would invite questions such as: How do users actually make sense of algorithms? How do they think that algorithmic recommendations work?

[1]School of Communication, Universidad de Costa Rica, San José, Costa Rica
[2]Universidad Estatal a Distancia, San José, Costa Rica
[3]School of Communication, Universidad de Costa Rica, San José, Costa Rica

Corresponding author:
Ignacio Siles, School of Communication, Universidad de Costa Rica, CP 11501-2060, San José, Costa Rica.
Email: ignacio.siles@ucr.ac.cr

In this paper, we follow Iliadis and Russo's (2016) call for critical data studies that investigate "meta-theoretical modes of conversation and styles of [...] thinking" (p. 2) but argue that this form of investigation also needs to focus on the users of media technologies. We seek to understand how people make sense of datafication processes such as algorithmic recommendations in daily life (Kennedy, 2018). To this end, we examined how a group of Spotify users in Costa Rica formulated "folk theories" of how this platform and its algorithms work. Folk theories are "intuitive, informal theories that individuals develop to explain the outcomes, effects, or consequences of technological systems, which guide reactions to and behavior towards said systems" (DeVito et al., 2017: 3165). This case is relevant for critical data studies for various reasons. First, it focuses on a platform for which algorithms occupy a crucial position in its technological and economic models (Eriksson et al., 2019). Second, it brings to the fore how people make sense of streaming—a defining practice and technology of present media infrastructures (Thibault, 2015).

The focus on Costa Rica is significant given Spotify's recent growth in Latin America. According to the company, this region experienced the fastest growth in the worldwide number of subscribers in early 2019 (Iqbal, 2019). Examining the Costa Rican case also helps going "beyond data universalism" (Milan and Treré, 2019) by making visible the cultural specificities of data assemblages in the global South rather than assuming that they inevitably reproduce the patterns and processes identified in other places. In this way, we seek to "question the notion that engagement with digital media is based on and informed by a single culture" (Toff and Nielsen, 2018: 638).

Our analysis draws on triangulated data from 30 interviews, 4 focus groups with 22 users, and the study of "rich pictures" made by individuals to graphically represent how they make sense of algorithmic recommendations on this platform. We found two interrelated theories: one that personifies Spotify (and conceives of it as a social being that provides recommendations thanks to surveillance) and another one that envisions it as a system full of resources (for which Spotify is a computational machine that offers an individualized musical experience through the appropriate kind of "training"). Whereas the first theory emphasizes local conceptions of social relations to make sense of algorithms, the second one stresses the role of algorithms in providing a global experience of music and technology. We analyze why people espouse either one of these theories (or both) and how these theories provide users with resources to enact different modalities of power and resistance in relation to

recommendation algorithms. In this way, we argue that folk theories offer a productive way to broaden understanding of what agency means in relation to algorithms.

Enacting data assemblages through folk theories

We turn to the notion of folk theory to operationalize the "systems of thought" held by users in data assemblages (Iliadis and Russo, 2016; Kitchin, 2014). Folk theories are intuitive ways of thinking about things or issues, which are rooted in evolving practices and experiences, and are functional for individuals who adopt them (Rip, 2006). They are malleable ways to explain and act in the world. Folk theories matter because of how they shape the behavior of those who adopt them: they "organize experience, generate inferences, guide learning, and influence behavior and social interactions" (Gelman and Legare, 2011: 380).

We use folk theories to integrate (and expand) insights and concepts employed in critical data studies to theorize how people make sense of media technologies. For example, we see important links between folk theories and Bucher's (2018) "algorithmic imaginaries" or the "ways of thinking about what algorithms are, what they should be, how they function, and what these imaginations, in turn, make possible" (p. 113). Like "imaginaries," folk theories contemplate what people think and feel about algorithms and how this leads to specific ways of acting. In a similar manner, folk theories incorporate "data valences," that is, the "wide range of people's expectations of and values for data that emerge from their discourses and practices across different contexts for data" (Fiore-Gartland and Neff, 2015: 1468).

When scholars have employed the concept of folk theories in the case of media technologies, they have usually focused on the mechanisms and affordances on which platforms rely to recommend content (Rader and Gray, 2015). Eslami et al. (2016) thus found at least 10 theories held by users to explain how they thought that Facebook chose content for their News Feed. These theories centered on mechanisms such as how frequently users interacted with others on Facebook, how many reactions a post had generated, what formal features characterized a post, and when was a given content posted, among others. DeVito et al. (2018) noted that people also draw on information that is "exogenous" to platforms to explain how they work.

Although we share such interest in people's explanations of mechanisms and affordances, we take a somewhat different approach. We envision folk theories as

ways to enact data assemblages, that is, to bring into being a particular "data ontology" (Kitchin and Lauriault, 2014: 8). The notion of "enactment" points to how people forge and sustain specific realities (Mol, 2002; Siles, 2013). As Seaver (2017) explains, "actors do not act on pre-given objects, but rather bring them into being" (p. 4). We argue that folk theories enact data assemblages by forging specific links between their constitutive dimensions. Seen in this way, algorithms stand as a synecdoche of larger data assemblages (Gillespie, 2016). For this reason, we think it is necessary to go beyond an exclusive focus on how users think that Spotify works and also contemplate how they make sense of other dimensions of data assemblages, such as the platform's place in their daily lives and social relations, how they think it makes money, what their typical appropriation practices are, what other platforms and devices they use, in what places they typically appropriate them, what kind of social groups they belong to, etc. This approach helps to situate systems of thought about datafication within the wider context in which the mechanisms and affordances of platforms acquire certain cultural meaning.

If users enact data assemblages through folk theories, then it becomes crucial to understand why people espouse certain theories over others. To account for this, we draw on the work of Swidler (1986, 2001) (cf. Toff and Nielsen, 2018). For this author, culture is "a bag of tricks or an oddly assorted tool kit [...] containing implements of varying shapes that fit the hand more or less well, are not always easy to use, and only sometimes do the job" (Swidler, 2001: 24). Culture provides individuals with certain kinds of *capacities:* to perform specific identities, internalize habits, negotiate belonging to social groups, and express certain worldviews (Swidler, 2001). In Swidler's (2001) words, "Culture equips persons for action both by shaping their internal capacities and by helping them bring those capacities to bear in particular situations" (pp. 71–72). We argue that users espouse specific folk theories (as opposed to or alongside others) as they seek to develop cultured capacities through the use of technologies such as Spotify.

The notion of enactment also emphasizes the centrality of user practices in bringing into being certain data assemblages through folk theories (Seaver, 2017; Siles, 2013). Put differently, folk theories also matter for how they speak to issues of agency: they allow people to act in certain ways. Swidler's notion of "strategies of action" helps understanding how people act *through* folk theories. She defines these as "general solutions to the problem of how to organize action over time, rather than specific ways of attaining particular ends [...] [They] provide [...] one or more general ways of solving [...] difficulties" (Swidler, 2001: 82–83).

Through particular practices and strategies, people enact specific modalities of power and resistance in relation to algorithms. This, we suggest, enables a better understanding of what agency means in the age of algorithms.

Research design

This study was carried out in Costa Rica, a country that illustrates the interest that digital platforms such as Spotify have in Latin America: it has a relatively large middle-class, high Internet connectivity rates, and a reliable telecommunications infrastructure (Gao, 2015). Spotify arrived in the country in late 2013, and its user base has grown steadily since. A recent study showed that Spotify is among the most-used entertainment apps on mobile phones in Costa Rica (Red 506, 2018).

We opted for a research design of the qualitative kind to "delve into the workings of assemblages" from the perspective of users (Kitchin and Lauriault, 2014: 14). This type of methods have proved a valuable asset for critical data studies in that they allow to understand the centrality of "social context [...] in both the production and interpretation of meaning [and the] ever-present cultural regimes of interpretation [that] structure the analysis of all data, 'big' or small" (Dalton and Thatcher, 2014). They also help to "map different values for data evoked in different discourses of and contexts for data" (Fiore-Gartland and Neff, 2015: 1471). Our findings come from triangulated data (by using multiple sources), methods (by combining different strategies), and investigators (by employing various observers of the same phenomenon).

Our study employed three methods: interviews, focus groups, and rich pictures. We began by selecting a sample of Spotify users for interviews. Similar to previous studies, we shared a call for participants on social media profiles associated with the university where the research was conducted (DeVito et al., 2018). Beuscart et al. (2019) have shown that "heavy" users tend to explore more features in music streaming platforms than casual users. For this reason, we selected individuals who identified themselves as "heavy" users of Spotify, in order to identify people with more experience and a deeper understanding of the platform. This strategy allowed us to interest many individuals who had reflected specifically on how algorithmic recommendations work (thus enabling the formation of intuitive theories) but could have prevented us from identifying theories that come from more casual uses of the technology.

We selected 30 individuals among respondents for semi-structured interviews through a criterion strategy that fostered diversity in sociodemographic profiles.

Our sample included 15 men and 15 women, 19–52 years old, mostly educated, and from a variety of professional backgrounds. We interviewed this group of people between August and November 2018 at the University of Costa Rica for an average of 40 min. Since this university is located in the country's capital (San José), this sampling strategy also allowed us to talk with individuals who lived in several provinces of Costa Rica's Central Valley, where the majority of the population resides. Interviews focused on the history and practices of music consumption, but also included conversations about people's backgrounds and social contexts, and their use of various media technologies. Using an adapted version of the "think aloud protocol" (Fonteyn et al., 1993), we asked participants to open their Spotify account on a computer, which was projected on a screen. We then asked participants to explain the content shown on their accounts and the context of the recommendations displayed. We specifically requested explanations of how they thought that Spotify works and how it recommended this music to them. Interviews were recorded and transcribed in their entirety.

Second, we conducted four focus groups with 22 additional individuals (aged 18–62 years old) between August and October 2019. We employed the same sampling strategy described in the previous paragraph. That is, we fostered sociodemographic diversity in our sample (although almost all our participants have received higher education in various fields). Focus groups are ideal for exploring the *social* nature of folk theories, that is, how they form as people share them with *others* (including the researchers). Thus, in addition to gathering data on how individuals accounted for algorithmic recommendations, during the focus groups we also examined the dialogues, discussions, and collective construction of folk theories (Cyr, 2016). We focused on both the responses to our questions about the use of Spotify and the debates that unfolded to answer these questions. Focus groups were also recorded and transcribed.

We carried out a third research method, namely rich pictures. Rich pictures are a building block of the so-called soft systems methodology, an approach that emerged in the late 1970s to help actors in conflict reach agreements using a variety of visualization techniques (Checkland, 1981). We argue that some of these techniques, most notably rich pictures, can be used in the context of scholarly research as a tool for analyzing "complex situation[s] [and to] provide a space by which participants can negotiate a shared understanding of a context" (Bell et al., 2019: 2).

Rich pictures consist of diagrams or drawings made by individuals to graphically represent a specific phenomenon. We employed this technique as a method for making more explicit the unstated and taken-for-granted nature of users' knowledge of algorithms and data assemblages. We provided participants in focus groups with blank sheets and a set of pens. We then asked them to individually draw how they thought that Spotify worked and how it provided them with specific music recommendations. After explaining the exercise and allowing for sufficient time for the making of the pictures, images became the starting point of conversations during focus groups. Participants explained their own pictures and discussed aspects of other participants' drawings. The research team functioned as a facilitator of these conversations. We then analyzed these pictures by identifying the main patterns in relation to three specific questions: how did users represent Spotify? How did they express a relationship with the platform? How were algorithmic recommendations explained? We used Bell and Morse's (2013) guide to this end and thus coded for patterns in descriptive features and structures (such as use of colors, shapes, thickness, relationships, and arrangements, among others).

We drew on grounded theory to analyze and integrate the findings from different methods and sources into theoretical constructs. We fostered investigator triangulation by mixing individual coding and team analysis during three rounds of coding. First, we identified the variety of ways in which people made sense of algorithmic recommendations. This round was conducted individually by each member of the research team. The second round was conducted collectively and focused on comparing similitudes and differences in how each member of the team had coded users' accounts of algorithms. Finally, the third round of coding sought to aggregate the data into broader categories that captured the main patterns and relationships.

In this way, we identified two main folk theories. We focus specifically on these two theories because of how representative they are of the data and because they were the most coherent ones in the sense given by Gelman and Legare (2011), that is, they reflected the strongest interrelationships between concepts and beliefs in our data. The next section presents the results of this analysis. We integrate into our discussion excerpts from interviews and focus groups, as well as examples from rich pictures. (Interviews and focus groups were conducted in Spanish. All translations are our own.)

Folk theories of algorithmic music recommendations

Most participants in our study defined themselves as heavy and satisfied Spotify users. They have domesticated this platform into a regular component of their
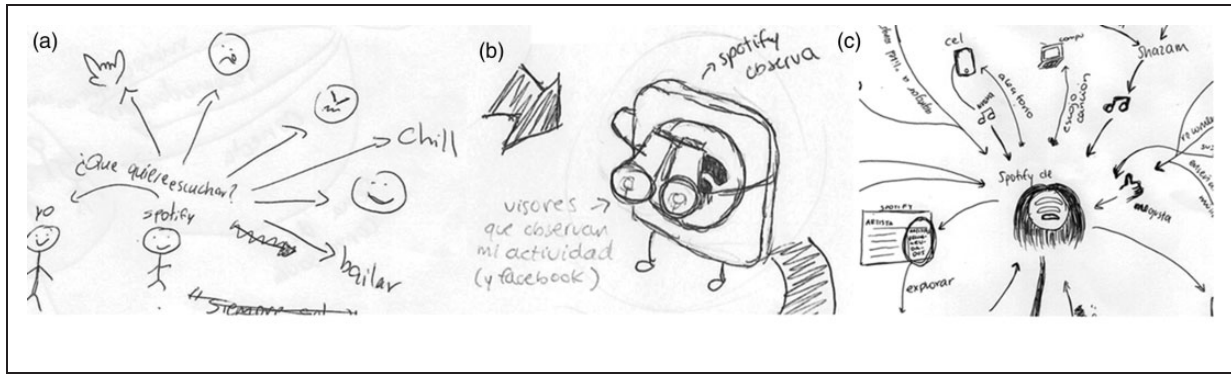
Figure 1. Representations of Spotify as a human-like being. (a) Spotify and user are drawn the same way. (b) A surveillant Spotify with eyes, arms, and legs. (c) Spotify has the user's hair.

daily lives. How users think of Spotify's algorithms stems in part from how they conceive of infrastructures and technologies other than this platform. Users typically incorporate their experiences with other algorithmic devices into their understanding of Spotify.

Links to other algorithms were established through two main dynamics. On the one hand, users aggregated their experiences with a variety of technologies into a general imaginary or stock of beliefs from which they draw to interpret *all* algorithms. Juliana, a 45-year old PhD student in environmental studies, thus assumed that Spotify's and Netflix's algorithms shared a common logic toward standardization: "Over the years, I've seen what the [Spotify] algorithm offers to me and, it's just like with Netflix: it keeps recommending me always the same [content]." Similar comments were made in relation to platforms such as Facebook.

But, on the other hand, users establish patterns of difference when they compare platforms that they think accomplish the same purpose (in this case, recommend music). Mario, a musician, thus noted during one of our focus groups: "[My understanding of Spotify] is built by contrasting it with Apple Music, which is completely different. [Apple Music] is more like 'my music.' I don't want anybody else to have access to it." Similarly, users compared Spotify and YouTube repeatedly. For this reason, folk theories need to be understood as part of larger data assemblages.

In what follows, we discuss the main theories that explain how they think Spotify makes recommendations and why they think these recommendations are successful (or not).

Dealing with a surveillant "buddy"

A common theory is to conceive of Spotify as a person-like being that engages in surveillance to provide a higher good: music recommendations. This theory is based on the premise of "mutual personalization" (Siles et al., 2019a): while users turn the platform into a reflection of their *personality*, they also *personalize* the platform by treating it as an entity that has human-like characteristics. In this process, people draw on local conceptions of friendship and public behavior to make sense of the platform and its algorithms.

Users employed expressions such as "a little dummy" or "toy" (*un muñequito*), or "my little buddy," to refer to Spotify. As Figure 1 exemplifies, the most common way to depict the platform in this theory was by characterizing it as having features such as eyes, hands, legs, hair, and even a (smiling) face. In Figure 1(a), there is no major distinction in how humans and Spotify are represented.

An exchange between participants during focus groups helps to further understand the features attributed to the platform:

> Interviewer: How do you define Spotify? What do you think it is?
> Mariana: Someone very intense.
> Laura: Yes, a stalker.
> Gloriana: But I wouldn't want to humanize it. It is better to say that it is an online hacker.
> Maria: Like a little ghost or weird little thing who says to you: "I saw that yesterday you were driving home and were listening to this. [Raises voice] I THINK YOU WILL LIKE THIS." And then just leaves...

During this conversation, Gloriana realized the underlying dynamic of the theory, that is, the personification of Spotify. Her immediate reaction was to tone down this tendency by expressing a desire not to "humanize it." Yet, as an alternative, she still put forth the notion of a person whose face is always hidden from plain

sight or who is not easy to recognize. As this conversation reveals, users also employ human-like characteristics to conceptualize those features they don't like about Spotify. Thus, they criticize receiving unrequested algorithmic recommendations constantly by defining the platform as "a very annoying dude" or "the most intense of your friends."

How to determine when a person has become "annoying" or too "intense" is of course a cultural process. It is not surprising that these terms are mentioned in Costa Rica, a country where "the importance of the collective and maintenance of harmony are valued over personal satisfaction" (Rodríguez-Arauz et al., 2013: 49). As a human-like being, Spotify's algorithmic recommendations thus need to comply with local rules of friendship and public behavior. Users thus prefer that algorithms hide their "face" rather than draw attention to them by providing one too many unsolicited recommendations that disrupt harmony.

Users invoked human-like characteristics also to refer to the financial dimensions of this data assemblage. In this way, they questioned the motivations behind the platform's recommendations. According to Maria, "I know that *he* wants us to be friends because *he* is making money. *He* laughs with me, but *he* is not feeling anything behind that smile" (emphasis added). In this account, Spotify is an insincere male counterpart who is primarily motivated by greed.

Personifying Spotify is a crucial way to naturalize issues of surveillance. There is a generalized belief that Spotify is watching everything users do on the platform. Users typically captured this by drawing Spotify as an eye. Gloriana, a 20-year old student, gave the following explanation of Figure 1(b): "Spotify watches my life, it is there watching us. I've connected my [account] to Facebook, and [Spotify] thus has lots of information to process." Yet, more than a "Big Brother," Spotify is seen as a "Dear Brother." It is, after all, a "buddy." Users conceive of surveillance as a necessary condition for receiving the benefit of useful recommendations. They envision algorithmic recommendations as a constant reminder that one is being observed for a reason that seems justified. Pablo, the 23-year old electric engineer who referred to Spotify as "a little dummy" and depicted it as a stick figure with a smiling face, explained Figure 1(a) thusly: "I heard that electronic gadgets listen to us and that's how [companies] can learn our tastes, what every person likes…That's a bit scary, but that's how things are."

As Segura and Waisbord (2019) argue:

> In Latin America […] the politics of data surveillance work differently than in the United States and other Western countries insofar as states historically did not develop massive, effective large-scale operations for gathering, analyzing, and managing data about populations during the past half century. (p. 417)

This is particularly salient in Costa Rica, which has built a national identity around the idea of peace since 1948—when the military was abolished (Sandoval, 2002). In the absence of historical precedents to evaluate its consequences, surveillance seems like less of a threat (it is only "a *bit* scary").

Moreover, according to users, surveillance is the precise factor that endows the platform with its great capacities. For example, people think that this allows Spotify to *know* users and, as a result, to better *understand* them. Pablo further explained:

> Spotify, the little dummy, asks: 'What would you like to listen?' It knows my tastes a little bit and [adjusts] if I want something heavier, if I'm sad, or upset, or happy, if I want something more chill or something for any occasion…it *always* knows what I want. (Emphasis added)

In this example, Spotify acts like a psychologist who not only recognizes the user's moods and desires but also helps him recognize his own emotions and affective states (Siles et al., 2019b).

As a human-like entity, users conceive of Spotify as part of their most intimate social relations and daily activities. Laura, an architecture student, explained: "[Spotify] is very much ingrained in my social relationships. It influences a lot how I interact with people around me." Like Laura, users interpret the possibilities offered by the platform to share music with others, learn what they are listening to, and talk about music with them as a means to shape their relationships. Maria, who created Figure 2, noted: "[Recommendations] generate shared interests and a form of bonding with someone else." In this way, users envision Spotify as a privileged social intermediary: its algorithmic recommendations are not only a way to form or strengthen a tie but also an intrinsic part of that relationship.

People mentioned three kinds of factors to account for how Spotify makes recommendations: practices of music consumption (such as frequency and listening rituals); the moods and affective states surrounding these practices; and the singularities of the music itself (meta-data about music genres, styles, tempo, etc.). As the next section shows, these criteria are not unlike what other folk theories suggest. What is distinctive is the logic that explains how these factors are combined and turned into personal recommendations. For people who think of Spotify in this way, the main criterion employed by the platform to recommend
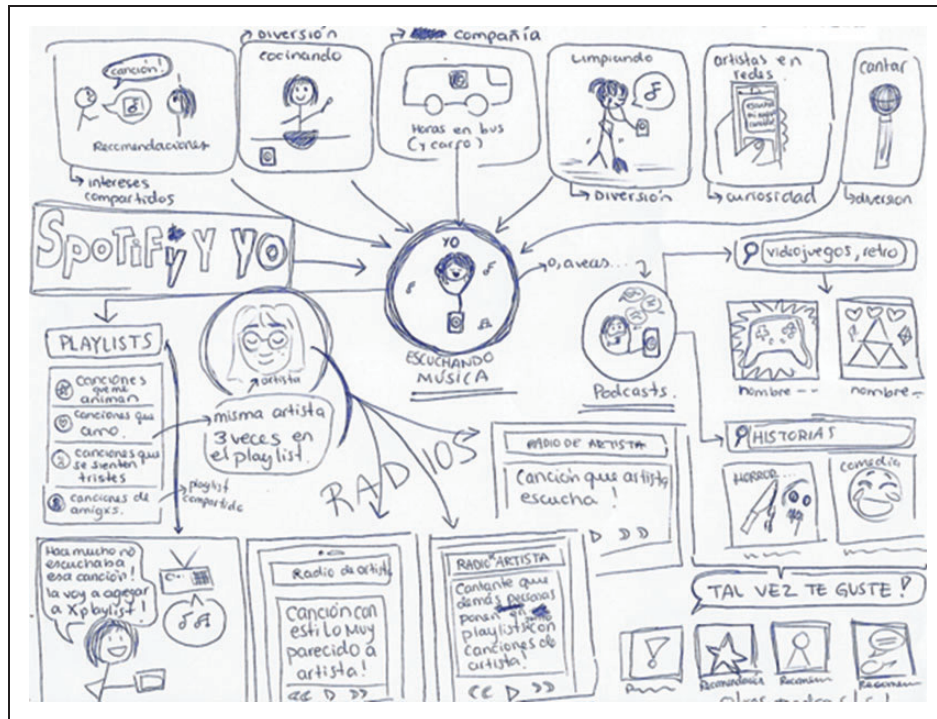
Figure 2. Representation of Spotify as embedded in social relations and daily life.

music is the construction of patterns based on similarity with users who share sociodemographic characteristics with them. This is consistent with the belief in Spotify as a central social intermediary. Leo, an audiovisual producer and self-taught musician, aptly summarizes this view: "I imagine that what the platform wants is to *average* between factors" (emphasis added). For Leo and other users, algorithms recommend the most typical or common music heard by particular social groups (of which Spotify is an intermediary) so that they can reveal the preferences of *most* people.

Training the algorithms of a "feedback control system"

Another common folk theory is to conceive of Spotify as a non-human yet responsive entity that can be trained to obtain results (in the form of algorithmic recommendations). Some users see it as a computational machine that provides expected results if appropriate input is given. These users employed terms such as "a very long code" or "a feedback control system" to define it. As Figures 3 and 4 show, most users who espoused this theory turned to basic geometric figures, such as squares, rectangles and circles, or simply Spotify's logo, to graphically represent the platform. Others preferred metaphors that stressed the abundance of resources: "a mine of minerals," "an encyclopedia," a "catalog," "a database," and a
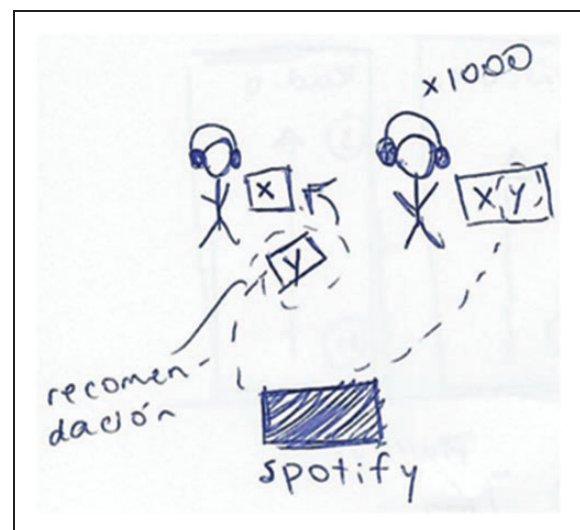
Figure 3. Use of basic geometric figures to represent Spotify.

"world." The notion of "resources" is central in Costa Rica's imaginary of national identity. By using expressions such as "No Artificial Ingredients" and "Only the Essentials" as international marketing campaigns in the past, the country has consistently emphasized the notion that the kind of resources available is what makes a place unique. These definitions thus create a view of Spotify as a machine that offers valuable and exclusive resources.
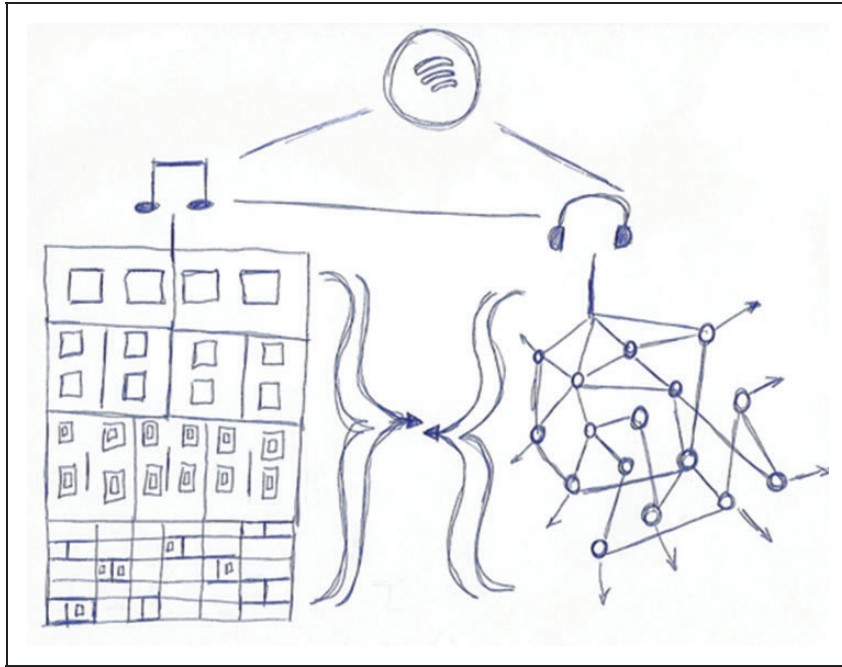
Figure 4. Distinction between Spotify (technology) and users (society).

This theory reproduces some of the main premises of the discourses that have surrounded music streaming platforms in other parts of the world. It emphasizes ideas aptly expressed by Harvey:

> streaming platforms aim to zero in on the tastes of the *individual* listener. [...] the recording industry is [...] betting on a future of distribution and discovery dictated by *quantification* [...] to execute the recording industry's century-long mission: suggesting with *mathematical* detail what a listener wants to hear before they know they want to hear it. (Harvey, 2014, emphasis added)

By adopting this logic almost word by word, users suggest that data assemblages in a place like Costa Rica are not necessarily different than in other countries. Moreover, it signals that users are strategically establishing equivalences among the operations of data assemblages around the world.

Whereas the first theory emphasized the notion of surveillance as the root of appropriate recommendations, this theory focused on the properties of technological systems in ways that are reminiscent of cybernetics. Users conceived of Spotify as a machine that aims at improvement through increasing specificity and precision in music recommendation. As Rubén, an electrical engineering student, put it: "Obviously, [Spotify] will never be perfect. You may like its recommendations or not. If you do, that's a positive feedback. It will give you more things like that and it will become more and more precise." For Gabriel, a political scientist, this requires time and repetition. He thus explained the process of improving algorithmic recommendations as "a system that is cyclical."

This theory asserts that appropriate "feedback" (through endless iterative loops) is what improves the Spotify machine. By feedback, users referred mostly to engaging in certain practices and using certain features to help Spotify's algorithms capture what counts as an appropriate recommendation and what does not. The preferred metaphors to label these feedback-giving practices were "training" or "teaching" algorithms. Referring to the streaming services she uses, Juliana explained this with words that could have been used to describe pet training:

> Out of nowhere, [they] 'throw' [recommend] something that I don't like and I'm like: 'But, what is this? That's a no, no, no.' I go ahead and delete them [these songs] and tell them [streaming services]: 'Not this.' I am thus training them a little bit so they won't recommend me such things. These last few years have been of training and there is not as much surprise [in music recommendations].

The theory discussed in the previous section conceived of Spotify as embedded in social relations. In contrast, these users think of data assemblages as divided in two clear-cut dimensions: on the one hand are humans (and

their ideas, practices, and relations) and on the other are technologies (and their materialities, infrastructures, business models, marketplaces, etc.). Figure 4 provides a graphic representation of this common belief. Mario, the musician who created this picture, explained: "I split it into two categories: First, the corporation [Spotify] itself, which provides the catalog. Second, the users. These are all connected and you can even see in real time what someone else is listening to." In this account, social relations are a strictly human dynamic.

Similarly, Viviana, an engineering student, decided to draw two different pictures during the focus group. When pressed to explain why, she indicated: "Because to me these are two completely independent things; [one] is how they designed the platform, its code; and [the other one] is what every person feels." This theory frames the use of the platform as a long-term relationship between these two different domains (human and technological). Mario thus reinterpreted the metaphor of feedback: "Users feed the platform and the platform gives them content in return." Algorithmic recommendations are seen as evidence that this relationship is evolving over time.

Users invoked the same factors to account for how they received algorithmic recommendations than those discussed in the previous theory: music consumption practices; the moods and affective states surrounding these practices; and the characteristics of music itself. However, this theory provides a distinct rationale to explain how these factors are combined or, more precisely, *calculated* by the Spotify machine. Here the logic is one of individualization, rather than average. Individualization results from the power of quantification. Says Rubén, "This is a system based purely on numbers. If I choose a song, that's a number. What the software does is take the data and make a comparison [between numbers]." Viviana added: "What I feel is that [Spotify] has databases and generates a code so that each person can follow a trail." For these users, algorithmic recommendations are codes that can only be cracked individually by each person. These codes (or "trails") are the product of computational capacities that aim to provide recommendations with mathematical precision.

For users, individualization means refinement in music recommendation or, as Viviana described it, "purification." Mario explained his rich picture, shown in Figure 4, in the following way:

> On the side of the artists and the catalog, it seems to me things are a bit more structured, and not so messy or chaotic [as humans]. I did it gradually smaller, through smaller boxes. There are big categories (genres, artists, etc.), which keep getting smaller and smaller...

The premise behind this statement can be stated thusly: although at first Spotify offers users songs that could be recommended to anybody, with the appropriate feedback the platform will gradually "add and subtract" data input (as a user put it) until it recommends music that is only appropriate for each individual.

Folk theories and cultured capacities

These two theories point to somewhat different cultural directions: one emphasizes the need to make algorithms fit into prevailing conceptions of friendship and social behavior, while the other suggests that algorithms (and the data assemblages they represent) do not operate differently in countries like Costa Rica. To further understand why people espouse either one of these folk theories (or both), we turn to Swidler's (1986, 2001) approach to culture. We argue that people adopt folk theories "to construct, maintain, and refashion the 'cultured capacities' that constitute actors' basic repertoires for action" (Swidler, 2001: 71). People draw on specific folk theories as resources that allow them to foster certain cultured capacities. Users in our study mobilized these two folk theories to strengthen three specific capacities: to be a specific kind of person, to negotiate a sense of belonging in certain social groups, and to sustain or strengthen ongoing social relations.

One of the most prevalent reasons that led users to espouse a specific theory were issues of identity. People think of Spotify and its recommendations as a way of performing a self, of being or becoming a certain kind of person. During an interview, Roberto, a 39-year old psychologist, described his relationship with the platform in the following way: "[Using it] suggests that you can have a refined taste, it is not only for others but also for yourself." Roberto thus considered that specific parts of the self (such as "taste") were at stake in how he used the platform. Both theories discussed above operated as markers of identity in this way. Like Roberto, those who personified Spotify integrated recommendations into definitions of the self. This is captured with precision by Laura's words: "Each thing that Spotify recommends to me is very much mine; when other people see it, I feel naked." Behind this assertion lies the premise that Spotify is embedded in social relationships and, as a result, it provides a window for others into the most private aspects of the self.

It was common for interviewees and participants in focus groups to justify their theory to others based on their academic major, profession, or trade. Roberto argued that his conception of the platform was "a very social psychology thing." Some of those who thought of Spotify primarily as a computational system quickly clarified that their understanding of

the platform was a product of their academic training. For example, Rubén noted that the term "feedback control system" came from the field of electrical engineering. Gabriel also indicated that his conception of Spotify as a "system" was a product of his training in political science. In this way, folk theories become an expression of who the person is and wants to be seen. To be a "good" psychologist or engineer is to think of the platform and the self in particular ways. Confronted by a clear articulation of the Spotify as social being theory given by another participant in a focus group, Viviana—the engineering student—asked: "Are you an Arts major or something similar?"

It would be misleading to interpret that people hold folk theories based exclusively on their profession. In our sample of informants, there were examples of engineers who personified Spotify and artists who thought of it as a system. Instead, we argue that ideas associated with specific majors (such as skills and professional routines) allow users to bring specific capacities to bear in certain situations, such as defining themselves by how they appropriate the platform. Established understandings of professions offer useful symbolic resources to obtain self-forming capacities.

Folk theories also operate as a way to negotiate group membership. This is by no means a minor issue in Costa Rica, where more importance is usually placed on "group affiliation (as opposed to personal achievement)" and where "interpersonal bonds are highly valued" (Rodríguez-Arauz et al., 2013: 49). The premise here is that knowledge of certain phenomena (bands, styles, artists, etc.) is shared by all members of a group. Adopting those phenomena thus becomes a way to signal membership. This cultural capacity is of key concern for those who personify Spotify. To be sure, people have traditionally seen music itself as a means of being part of certain groups. But how users achieve this capacity now rests on how they specifically think that Spotify's algorithms work. For example, for Carla, a 52-year old audit specialist, believing that Spotify recommended music by *averaging* collective preferences was crucial in following recommendations or not. She explains, "[I began using it] maybe to not feel so outdated that sometimes I have to ask what young people are doing these days. They feed me a lot in that sense so I don't stay behind." In this way, she argues, the platform allows her to "understand what are today's tendencies" in music consumption. This explanation combined both matters of content and issues of technology (Siles and Boczkowski, 2012), that is, an idea of how algorithms capture certain substance (the music of "young people") and a belief of how this is achieved (averaging what most users listen to into group "tendencies").

A similar example comes from those who have adopted the logic of individualization and quantification to explain how algorithms work. As noted above, this theory reproduces the main tenets of how various platforms promote their services and algorithms (Prey, 2018). By incorporating this rationale into their system of thought, users suggest that, despite the geographic distances, they can enact (and thus inhabit) the same data assemblage than those in other parts of the world. Many users in Costa Rica interpret differences in catalogs (that is, the substance of what is being recommended) as a form of exclusion (Siles et al., 2019a). They typically react against not having the same content available in other countries (despite paying the same fees).

This form of thinking also applies to technological infrastructures (that is, how recommendations work). Users expect that technologies will function the same way *everywhere*. Explaining how he became a Spotify user, one interviewee recalled, "A friend who lives abroad said to me: 'This is what everyone is using now and you have to use it!' He was referring to using Spotify on the computer and on the phone." Porter (1995) famously argued that quantification is a technology of "distance" that allows seeing phenomena from afar. Yet users in this case tend to value it for the opposite reason: it makes them feel closer to a world that they aspire to be a part of. They value algorithmic recommendations as a technology of "proximity" that helps them feel connected to global conversations about music and technology.

Users also adopt certain theories to foster the capacity of keeping or strengthening social relations that are meaningful to them. This capacity is aptly captured by Levy's (2013) notion of "relational big data": "people *constitute* and *enact* their relations with one another through the use and exchange of data" (p. 75, emphasis in original). Considering social relations as central to music consumption is a key in personifying Spotify. Carla, the audit specialist, explains:

> I prefer the personal over the digital. I feel like I can put a face [to recommendations]. That's a trigger for me. It makes me say, 'I have to look at this song because it was someone [who recommended it]'. Emotionally, it's not the same.

Personifying Spotify thus creates fertile grounds for accepting its recommendations. It also solidifies the view that Spotify is an ideal intermediary of social ties. As Pablo, the electric engineer, put it, "Spotify [is a matter] of social relations with my friends because it gives us conversation topics, it connects you even more with the people you love."

A specific instance of this dynamic is the use of Spotify to maintain certain social relations through music. Many users indicated that they began listening to certain artists or songs because they reminded them of those who helped discover this music. This means that they acquired the habit of listening to certain music because they were exposed to it through another person. In these cases, the music stands in for the relationship as a form of "inheritance." Personifying Spotify is a way to keep musical inheritances and relationships alive.

Cultured capacities are thus central to understanding why users espouse certain theories on specific occasions and why they can oscillate between them. The next section explains how these theories and capacities are linked to specific user practices and ways of relating to or resisting algorithms.

Agency, power, and resistance

Folk theories provide people with means to act in certain ways. In the case of Spotify, these theories provide users with resources to carry out a specific set of strategies of action through which they enact different modalities of power and resistance in relation to recommendation algorithms.

Each folk theory posits that agency is distributed differently between users and technologies such as algorithms. Users who personalize Spotify tend to attribute it a form of power that is difficult to elude. This power stems from the platform's place in their interpersonal lives and from the knowledge it has acquired from users through surveillance. Leo, the audiovisual producer, stated:

> [Once you begin using the platform] you sign the agreement. There is no turning back. It is a demon. It takes control of everything. When [Spotify] is over, it's going to be a shock. We'll think: "Remember when it existed and there were all those data that [we] gave to it?"

Not only does Leo describe the platform as a kind of being, but he also emphasizes how powerful he thinks its surveillance is: it ends up *possessing* the user in both the sense of ownership and invasion. At that point, Spotify stopped being a "buddy" and became a devil.

Instead, the theory that envisions Spotify as a machine distributes agency in more symmetrical ways. During a focus group, two individuals arrived at this conclusion. Rubén began by stating: "I think the algorithms feeds on the person"; Viviana immediately finished his response: "It needs it. And then vice versa."

People mobilize different strategies of action based on the theory they hold (and the agency they attribute to the platform). The first theory we discussed oscillates between two distinct action strategies: submission and resistance. Users shift between these two strategies based on their perception of surveillance. Studies have shown a fundamental tension in people's response to surveillance, best captured by Lyon (2006): "the more stringent and rigorous the panoptic regime, the more it generates active resistance, whereas the more soft and subtle the panoptic strategies, the more it produces the desired docile bodies" (p. 4). This conundrum aptly describes users' strategies of action in relation to Spotify.

On many occasions, users think they are unable to resist the platform. As Marcia, an Arts student, put it: it is just too "addictive." Her rich picture portrayed a data assemblage oriented toward financial goals. In this account, the objective of Spotify is to get users addicted to the platform in order to make them pay a monthly subscription. Yet, once again, users emphasize the benefits of submission rather than the costs. For example, people typically stress Spotify's role as a social intermediary to justify their inability to resist the platform. When they do this, they downplay issues of surveillance and normalize the appropriation of features that afford a sense of being in contact with their networks of social ties. Leo explained a strategy of action he employs regularly:

> I can't finish one week without listening to my 'Discover Weekly' [an algorithmically curated set of recommendations that changes on a weekly basis] and the one from three more people. If not, I wonder: 'What could I be missing?' It has to be people whose music I admire or [who I follow] for emotional reasons.

Leo described this strategy as a ritual he is *unable* to stop practicing. By considering algorithmic recommendations as a neutral window into other people's lives, people normalize the use of specific technological features. Other affordances that allow this strategy are watching what others are listening on the platform (through the "Friend Activity" feature) and using the "Charts" tab to listen to "Top 50" artists in the country or other parts of the world.

Conversely, strategies of resistance tend to take place when the surveillance of the Spotify being is more explicit. For some, algorithms disrupt Costa Rica's much-valued social harmony when they "fail," that is, when they recommend songs that users deem outside of their musical interests. At this point, algorithms show their surveillant "face" rather than remain hidden. According to one interviewee, "It always fails. Let's just say that, of all the times Spotify has recommended something to me, I only like one song and that's the only song I like from that band."

For others, surveillance becomes evident because of the way algorithmic recommendations are presented on the platform: they are explicit, arrive constantly, and have neither context nor explanation. Mario clarified this point during a focus group:

> I hate apps that suggest things to me! Do not tell me what I need to listen to! If I do want to listen to something new, I just ask another *real* person. [...] And there's something else: I don't like the interface. I feel like I'm in a labyrinth, like I'm getting inside a hole. (Emphasis added)

In a similar manner, Luis, a 19-year old college student, indicated:

> If an algorithm recommends it to me, I don't know if I'm going to listen to it, because it is always giving me music, whether I like it or not. Sometimes I pay attention to it and sometimes I just ignore it. People do have more value [than algorithms] because they do it [recommend music] personally.

Luis thus uses ignorance of algorithms strategically. Other people indicated employing affordances that prevent algorithmic recommendations to appear in the first place, such as listening primarily to their playlists, searching for specific songs, or pre-defining the queue of songs they will listen to at any given time (cf. Siles et al., 2019b).

The second theory we discussed is tied to a rather different set of action strategies. The belief that users are *interacting* with the platform is crucial in this case. In this view, users and algorithms are interconnected through feedback loops. Users expect that the Spotify machine will accomplish its role in this relationship and improve constantly to provide more specific music. In this sense, reliability works as a "data valence" (Fiore-Gartland and Neff, 2015). Accordingly, they place responsibility on people: they need to hold up their end of the bargain. This set of action strategies acquires the status of an exigence. In order for individualization to work, users consider it mandatory to engage in feedback-giving practices such as letting the platform know whether they liked a particular song (by tapping the "heart" feature), "following" an artist, and purposefully and repeatedly listening to certain music to establish a pattern that can be recognized by the platform. These strategies need to be carried out constantly and almost without exception to "train" algorithms appropriately.

Concluding remarks

This paper argued that folk theories matter for critical data studies because they help to broaden our understanding of how users make sense and relate to datafication processes in daily life. They also enable a better understanding of how people enact their agency in relation to these technologies. To make this case, we developed three main arguments.

First, we contended that folk theories help to examine the cultural specificities of datafication processes. Because of the prevalence of this definition in the USA and other Western countries, it might seem "obvious" that people think of platforms like Spotify as a computational machine aimed at individualizing music experiences through Big Data procedures. Yet, in this paper, we demonstrated that not all people think of these platforms in this way. Alternatively, we proposed to shift the analytical focus and investigate instead why such definitions become "obvious," for whom, and under what circumstances. In the case we examined here, what might seem "obvious" is the fact that users think of algorithmic technologies as an intermediary of social relationships. This is explained partially by the fact that surveillance has a relatively different history in Costa Rica and other countries in the South. Even the cultural meaning of quantification, perhaps well established in other places in the global North, changes when one goes "beyond data universalism" (Milan and Treré, 2019): users can adopt such thinking not because it is "natural" or "inevitable" but rather because it allows them to acquire a capacity they value (such as participating in global conversations about music and technology).

Second, we provided an explanation of why users enact certain folk theories (over or alongside others). We built on the work of Swidler (1986, 2001) to suggest that folk theories operate as resources that allow individuals to obtain cultured capacities such as performing specific identities, negotiate belonging to social groups, and sustain existing social relationships. Paraphrasing Swidler (2001: 36), we showed that people do not simply have folk theories; they have vivid stories about how they received recommendations that shaped their social lives and selves. We envisioned folk theories as part of cultural repertoires and practices through which people enact data assemblages and their place in them. In this sense, folk theories become useful or acceptable resources for people if they fit with specific cultural situations and demands.

Third, we argued that folk theories offer a key entry point into issues of agency in relation to algorithms. By situating folk theories as critical parts of the "systems of thought" that constitute data assemblages, we conceptualized agency as a product of the relationship between people and algorithms. Scholarly literature tends to portray a one-sided scenario of "algorithmic power." In this paper, we sought to put forth an alternative to the tendency to assume rather than investigate

algorithmic power. We showed that people do not think or act in the same ways when relating to algorithms. Concurring with Livingstone (2019), our perspective starts from the recognition "that all analyses of media power include, implicitly if not explicitly, claims about audiences, meaning that research with audiences [...] must be brought within in the critical project" (p. 179). Folk theories provide a useful resource to this end.

Our approach also stressed an often-neglected dimension of agency in research about users and algorithms: imagination. Emirbayer and Mische (1998: 970) consider the "projective element" represented by imagination as one of the three components of the "chordal triad of agency," alongside with habit and judgment. They explain, "Projectivity encompasses the imaginative generation by actors of possible future trajectories of action, in which received structures of thought and action may be creatively reconfigured in relation to actors' hopes, fears, and desires for the future" (Emirbayer and Mische, 1998: 971). Despite some notable exceptions (Bucher, 2018), most accounts of user interaction with algorithms have been limited to discussions of the practical dimension of agency at the expense of imagination. Accordingly, researchers have located the agency of users in practices of resistance, autonomy, and awareness (Beuscart et al., 2019; Eslami et al., 2016). Yet, if algorithms are part of data assemblages where power is produced, a much thorough understanding of human and technological agency is warranted. In this sense, folk theories offer a way of empirically assessing how agency is enacted through both practice and imagination. We contributed to this critical project by showing how theories and imaginaries of algorithms relate to specific sets of action strategies that shape modalities of power and resistance.

Further research could help to reach the analytic promise of folk theories for critical data studies. We suggest that a comparative research agenda could offer fruitful avenues for future studies. This research agenda rests on three building blocks. First, studies that compare findings from different *research methods and data sources* would help identify how users think of algorithmic technologies. In this paper, we hope to have shown the potential of various forms of qualitative research and triangulation (data, method, and investigator) for examining the workings of data assemblages from the perspective of users. Because technologies (such as algorithms) are complex procedures hidden from plain sight and embedded in larger socio-technical systems (Seaver, 2017), understanding them can be challenging for users. Thus, a combination of methods and sources with different sets of strengths should provide a better opportunity to reveal why people think (and act) as they do. In this sense,

qualitative methods provide an ideal supplement to so-called digital methods. By focusing on the results of users' actions, digital methods offer great opportunities to understand what people actually do when they use technologies such as Spotify (rather than depending exclusively on users' self-accounts). Yet, they also run the risk of taking for granted why people act the way they do or of projecting the researchers' own folk theories onto users.

Second, because of the emphasis on culture, *empirical comparative studies* of different geographical settings should enable a better understanding of how local or global certain folk theories are. In addition to studies between (and within) countries, this line of research could be conducted in different groups of people and various moments in time. For example, studies can be carried out with more casual users or individuals without formal education to assess the generalization potential of the theories we identified. Finally, research could examine the intuitive theories that emerge from a *comparison of how people domesticate various platforms*. As noted above, conceptions of how algorithms work on Spotify were informed by the use of other technologies (and vice versa). As a supplement to studies that focus on one single platform, research should account for how the proliferation of media technologies and logics shapes how users understand them both individually and collectively. After all, using multiple platforms is one of the staples of contemporary media ecologies.

ORCID iD

Ignacio Siles ⬤ https://orcid.org/0000-0002-9725-8694

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