Training the Algorithm: YouTube Governance, Agency, and Literacy*

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ABSTRACT. This study discusses the experiences of young Mexican users with YouTube recommendation algorithms. The study seeks to determine whether these users are subordinated to algorithmic governance or if they are capable of developing resilient tactics against algorithmic power logic through their own agency. The study uses a focus group-centered qualitative analysis. Our results reveal that users are not entirely subordinated to these platforms. Their agency varies depending on their appropriation of technology, their intuitive theories about how the technology works, their capability to prevent algorithmic distortions, and the resources available to evaluate the quality of the information offered. In the last section of the study, we identify the specific skills that constitute algorithmic literacy.

KEYWORDS: YouTube / Algorithms / Users / Digital Literacy / Transmedia Literacy

ENTRENAR AL ALGORITMO: GOBERNANZA, AGENCIA Y LITERACIDAD EN EL USO DE YOUTUBE

RESUMEN. Este estudio aborda las experiencias de jóvenes usuarios mexicanos con los algoritmos de recomendación de la plataforma YouTube. Busca determinar si se encuentran subordinados a la gobernanza algorítmica o si, por el contrario, son capaces de desarrollar algunas tácticas para resistir las lógicas del poder algorítmico a través de su propia agencia. Utiliza una metodología cualitativa centrada en grupos de

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enfoque. Evidencia que los usuarios no se subordinan completamente a las plataformas y que sus posibilidades de agenciamiento varían en función de sus diferentes modos de apropiación de la tecnología, las teorías intuitivas acerca de su funcionamiento, la capacidad para evadir las distorsiones algorítmicas y los recursos para evaluar la calidad de la información ofertada. Como resultado del análisis, se han identificado las habilidades específicas que constituyen la literacidad algorítmica.

PALABRAS CLAVE: YouTube / algoritmos / usuarios / alfabetización digital / literacidad transmedia

TREINAR O ALGORITMO: GOVERNANÇA, AGÊNCIA E ALFABETIZAÇÃO NO USO DO YOUTUBE

RESUMO. Este estudo aborda as experiências de jovens usuários mexicanos com os algoritmos de recomendação da plataforma YouTube. Busca determinar se eles estão subordinados à governança algorítmica, ou se, ao contrário, são capazes de desenvolver alguma tática para resistir à lógica do poder algorítmico por meio de sua própria agência. Utiliza metodologia qualitativa com foco em grupos focais. Mostra que os usuários não estão completamente subordinados às plataformas e que suas possibilidades de agência variam dependendo das diferentes apropriações tecnológicas da plataforma, das teorias intuitivas sobre seu funcionamento, da capacidade de contornar distorções algorítmicas e dos recursos para avaliar a qualidade das informações oferecidas. Como resultado da análise, as habilidades específicas que constituem a alfabetização algorítmica foram identificadas.

PALAVRAS-CHAVE: YouTube / Algoritmos / Usuários / Alfabetização Digital / Alfabetização Transmídia

1. INTRODUCTION

Automated recommender systems, also known as recommendation algorithms, are software programs developed for social platforms such as Facebook, YouTube, Netflix, and Spotify to solve computational problems efficiently. Their primary function is to provide users with information that the algorithm predicts will be relevant to them (Bucher, 2018). Algorithms are digital objects created by engineering but used in social and cultural environments. Therefore, they shape usage, imaginaries, and decision-making. The specialized literature has treated the interaction between algorithms and culture as a dramatic narrative that often ignores human agency and has given considerable power to automated decisions about what is visible, acceptable, or eligible in social and cultural terms (Velkova & Kaun, 2021). Nevertheless, the cultural leverage of algorithms cannot be accurately determined without assessing their use in given situations (Seaver, 2017).

Recommender systems decide and display what the user may view. On the one hand, this action influences user decisions. On the other hand, it implies authority over what is considered important and visible and, in turn, over what is considered secondary and invisible (Bucher, 2018). The problem of the opower of algorithms has been recently addressed using the concept of algorithmic governance (Danaher et al., 2017). This concept assumes that, in a context where digital data —produced inside and outside the Web— proliferates, there is a tendency to leave decision-making to algorithms and artificial intelligence systems.

Given algorithm's central role in digitally-mediated everyday life, algorithmic recommendations significantly influence social media users. Extreme positions attribute rationality, autonomy, and objectivity to algorithms because of their technical characteristics. However, they do not evaluate algorithmic performance in specific usage contexts (Roberge & Seyfert, 2018). Hence, it is critical to determine what happens to users and their agency when accessing information mediated by automated recommendations. It is also essential to identify what knowledge and intuitions come into play when users negotiate their decisions with these systems.

This study discusses the experiences of young Mexicans with YouTube's recommendation algorithms. The study ultimately seeks to determine whether these users can develo strategies to resist algorithmic logic through their agency (Velkova & Kaun, 2021). It also aims to identify their intuitive and critical knowledge, and the practices that generate agency and resistance to unwanted recommendations produced by these algorithms. In addition, it also seeks to systematize these practices and knowledge as a set of recommendations for designing digital literacy interventions.

The following are our research questions: What are the intuitive theories and knowledge users already have about the operation of YouTube's recommender systems?

What elements of the YouTube interface generate algorithmic governance according to users? How do their theories and knowledge influence their agency and decision-making regarding what information to consume or discard? What tactics are users developing to resist algorithmic governance?

These questions seek not only to understand how algorithms are shaping current digital culture but also to address the need to educate new citizens in critical digital skills that may allow them toidentify the senses and meanings that come into play in digital contexts in order to assess and make decisions about information and generate their own content (Garay Cruz & Hernández Gutiérrez, 2019, p.13).

This work introduces a specific type of transmedia literacy (Scolari, 2016; Lugo, 2016; Cruz Sánchez, 2019) recently termed "algorithmic literacy" (Ridley & Pawlick Potts, 2021). In the final part of this study, we will discuss the skillset that constitutes algorithmic literacy.

2. BACKGROUND

Algorithmic cultural studies are the referential framework for this work (Striphas, 2015) with a particular focus on algorithmic governance (Danaher et al., 2017), resistance (Treré, 2019) and agency (Velkova & Kaun, 2021). This framework relates to critical digital literacies (Garay Cruz, 2019), transmedia literacy (Scolari, 2016), and, particularly, algorithmic literacy (Ridley & Pawlick-Potts, 2021).

2.1 Algorithmic Cultures and YouTube

Rieder (2020) defines an algorithm as a finite set of well-defined single-input, multiple-output steps built simply enough to be executed with pencil and paper. He further distinguishes between the algorithm's abstraction and its configuration in software; that is, the implementation of the algorithm in a program that a computer can read. For Dourish (2016), what the social sciences call algorithms is actually a reductionist image that refers to a "system of digital control and management achieved through sensing, large-scale data storage, and algorithmic processing within a legal, commercial, or industrial framework that lends it authority" (Dourish, 2016, p. 3).

According to their information organization logic, there are different types of algorithms: search, ranking, information interpretation and filtering, database indexing, *machine learning* training, and network clustering algorithms (Rieder, 2020). Automated recommender systems are critical to current media ecosystems. On the one hand, they are essential information sorters that discern what is visible by processing information lists; what has precedence by assigning a priority order to list contents; what will be relevant for a group of people through trend identification; and also what will be important

to users through personalization processes based on their content access history (Gillespie, 2014). On the other hand, these procedures constitute a technical reduction of cognitive processes linked to communication, expression, and information. Moreover, they represent a transition from culture to technology, thus resulting in an algorithmic culture (Striphas, 2015).

With an average of two billion monthly visits, YouTube ranks second among the most visited platforms globally (We Are Social, 2020). In Mexico, 61 % of the total adult population uses YouTube (Statista, 2021). In 2020, its user count reached 55 million (YouTube Brandcast, 2021). More than half of them use YouTube daily (Vega, 2021). Every minute, four hundred hours of videos are published on YouTube, eight of them uploaded in Mexico (César, 2017). Consequently, YouTube's cultural role goes far beyond being a video storage and publishing platform: it is a central communication medium that produces different contemporary cultural types (Burgess & Green, 2018). For this reason, the company requires a complex algorithm system to organize, manage, and recommend information.

Multiple information management algorithms converge on the YouTube interface. The platform uses two recommendation systems: one offers similar content for all users, such as the content found in the trend explorer. The other offers customized content, such as the videos displayed on the user's home page and recommendation lists. These suggestions are associated with the videos the user chooses to watch or with topics of interest based on the user's video-watching history (Rieder et al., 2018).

2.2 Governance and Algorithmic Resistances

Algorithmic governance is defined as a set of processes that delegate human decisions to automated recommendation systems. The problem is that social biases, lack of diversity of information, extreme polarization, and fake news content take part in these processes. These elements can potentially affect people´s decision-making processes (Danaher et al., 2017).

Algorithmic governance is built not only on technical availability but also on narratives that reinforce its dominance. In this context, user agency and action possibilities are often neglected (Velkova & Kaun, 2021). The sociology of technology, a trend that emerged in the 1980s, highlighted the interpretive flexibility of socio-technical systems and the importance of users when redefining socio-technical systems and repurposing their original design (Pinch & Bijker, 1989). Herein, users generate tactics to build alternatives and resist to algorithmic dominance (Treré, 2019). For these reasons, particular emphasis must be placed on assessing the social effects of algorithmic governance (Kitchin, 2017) and identifying how users resist algorithmic dominance through their agency.

This algorithmic culture represents a challenge for the social sciences in different ways. First, there is little information on the algorithmic processes used by large platforms as they are all trade secrets (Pasquale, 2016). Second, algorithms are first developed by IT departments using their own procedures and codes, but they are later used in the media industries to shape cultural processes. Here we must observe how algorithms interact with users and build not only technological experiences, but also cultural ones. And third, algorithms are dynamic and may perform random actions. Although their core is comprised of sequential steps, the data they are fed with can lead to unpredictable results (Kearns & Roth, 2019). Despite these limitations, several studies identify and critically examine certain recurrent behaviors in YouTube's recommendation systems and their impact on its content.

Rieder et al. (2018) conducted a study focused on data provided by YouTube to identify the factors that cause the platform's search algorithm to change results over time. The lists returned by search results consider two critical dimensions: relevance and ranking. Relevance includes all videos in which titles, descriptions, comments, and image content match the search criteria. Ranking sorts the results list by priority. The authors found that some search results remain static while others change. They concluded these variations depend on multiple factors: the number of searches and video uploads on a given topic, viewing time of any given video, and, most importantly, , the number of subscribers of the channels that develop content.

The way YouTube recommends content is far from cultural objectivity. In fact, these recommendations often feature distortions and a lack of diversity. One of the first authors to discuss distorted algorithmic behavior is Tufekci (2018). The author describes a scenario in which, after watching a video about Donald Trump's presidential campaign, the platform's recommendations shifted increasingly to videos with extreme right-wing political content, from white supremacy to conspiracy theories, amplifying the primary topic.

In general, the literature indicates a tendency for social platforms to create bubble filters (Pariser, 2014). These refer to the predisposition of automated systems to recommend large amounts of content related to a user's interests, whether in terms of connections or content. Regarding YouTube bubble filters, Kaiser and Rauchfleisch (2020) assess automated recommendations of YouTube channels from the United States and Germany. They conclude that users who access news content on mainstream media can reach extreme right-wing content in just a few clicks and then remain for a long time within a bubble that only presents these political points of view. However, these bubbles do not provide an opposite path toward news content. Likewise, small political channels recommend the larger channels, but the opposite does not happen. Sued (2020) reaches a similar conclusion when investigating filter bubbles formed by anti-COVID-19 vaccine content.

Furthermore, Bishop (2019) discovered a visibility hierarchy associated with class, race, and gender stereotypes in a study on beauty vloggers. The algorithm's results favor middle-class actors closely linked to patterns of consumption, beauty, fashion, and relationship modes similar to those followed by youth media but do not present alternative models.

Lukoff et al. (2021) discuss the elements of the YouTube interface that provide users with greater or lesser agency and, therefore, greater control over platform decisions. Search systems, subscriptions, and playlists favor greater agency, whereas automated recommendations, profile suggestions, and banner ads entail less agency.

In the same direction, there has been research on intuitive user beliefs and theories about the algorithmic functioning of social platforms because these beliefs and theories usually guide decisions and practices. Even when these intuitive theories are implicit and imprecise, they bear significant implications as they arrange user experiences, draw inferences, guide learning, and influence behavioral and social interactions. Siles et al. (2020) assess the intuitive theories of Spotify users in Costa Rica. They identify two categories: some users imagine the platform as a vigilant entity that watches over them and knows all their preferences- In contrast, others characterize Spotify as a resourceful machine that provides good recommendations and good entertainment. The authors emphasize how these intuitive theories help users decide how to use the platform.

After searching through the Scopus and SciELO databases, we could not find any studies on user experience involving YouTube recommendation systems in Latin America. Hence, this work seeks to broaden our understanding of social platform use within the region.

2.3 From Digital Literacy to Algorithmic Literacy

Lugo (2016) distinguishes two lines of work regarding digital literacies. The first one refers to formal practices aimed at acquiring the technological knowledge needed to function in contemporary society, something that, at least in theory, schools and other social training institutions must provide. The second line of work regards transmedia education as a process that happens during technological appropriation by users and does not require institutional mediation. Several authors (Cruz Sánchez, 2019; Hernandez & Hernandez et al., 2019) prefer to refer to this second line as "literacy", since the term not only defines the process in a neutral way but also emphasizes the incorporation of knowledge in context, beyond the roles of schools and other institutions. Transmedial literacy encompasses the skills, abilities, and attitudes that play a part in digital techno-logies (Scolari, 2016). Locating and accessing information, managing digital identities, awareness of socio-digital coexistence, understanding social platforms' business inter-ests and critical thinking are some of the competencies identified as part of transmedia literacy (Cruz Sánchez, 2019).

Despite all the contributions from digital literacy and education studies, it is still necessary to delve into new elements, which become a part of the digital ecology as they are conceptualized as objects of study. One of these elements is the social platforms' algorithmic action . Algorithmic literacy refers to a skill set that allows users to

- Understand and reason about algorithms and their processes.

- Recognize and interpret their use in systems (whether embedded or overt).

- Create and apply algorithmic techniques and tools to problems in a variety of domains.

- Assess the influence and effect of algorithms in social, cultural, economic, and political contexts.

- Position the individual as a co-constituent in algorithmic decision-making. (Ridley and Paulick-Potts, 2021, p. 4)

This paper discusses information searching, accessing, and evaluation practices on YouTube to identify how users avoid or mitigate the algorithmic distortions and biases that arise from scarce content diversity, business interests that shape rankings, disinformation, polarized results, and filter bubbles.

3. METHOD

Digital ethnography (Hine, 2015) stresses the importance of studying digital interactions as a network of humans and technological objects. In this sense, Seaver (2017) has led the way in using qualitative methods to study user experiences with algorithms. Seaver proposes addressing them as processes where rigid instruction sequences interact with users in multiple, variable, and open ways. Algorithms intervene in everyday life as part of processes that do not differentiate clearly between the social and the technical. *Algorithmic experience* is a conceptual tool that considers the user's perspective to understand better how users perceive these algorithms and to what extent these algorithms influence users (Alvarado & Waern, 2018). Alvarado et al. (2020) assess how middle-aged adult users perceive the YouTube algorithm in four different countries. The authors identify that, from a user's perspective, YouTube recommendation systems are influenced by four elements: user behavior within the platform, the behaviors of other users, the algorithm as an actor that links user's patterns of consumption with similar patterns, and the actions of YouTube as a company on behalf of its own interests.

This study focuses on the algorithmic experiences of 45 regular YouTube users aged 18 to 23, all humanities and social studies students at Mexican universities. They all live in the city of Querétaro, Mexico. According to the survey conducted at the onset of the study, YouTube is the most popular audiovisual platform among our respondents.

Forty-five percent of them access the platform daily, 30 % use it from time to time, and the remaining 20 % use it every other day. In addition, 11 % either have posted or post videos frequently to the platform. The survey also included closed questions assessing general aspects of user experience within the platform, such as the attention paid to the home page, the extent of users' acceptance of the platform's recommendations, and the identification of fake news in profiles.

To further understand their experiences with YouTube algorithms, the participants were divided into six focus groups and interviewed by videoconference between August 2020 and March 2021. For our purposes, focus groups are a qualitative research technique where participants are collectively questioned about a specific topic by a moderator (Croucher & Cronn-Mills, 2018). Each focus group discussion was video recorded and lasted approximately 40 minutes. In the first focus group activity, participants represented their ideas of how the YouTube algorithm works in sketches and diagrams based on the concept of *rich pictures*. This idea helps participants to visually express a set of relationships between complex system components using paper and pencil. In this way, participants may interconnect thoughts that are difficult to express; the sketches help them think and act (Bell & Morse, 2013). Rich pictures are an interesting resource for people to represent their native theories about the operation of complex systems such as algorithms (Siles et al., 2020). Next, participants shared their sketches and diagrams in an online collaborative panel, which allowed them to obtain an overview of all contributions. These sketches and diagrams also served as a starting point for discussing the different ways of accessing content on YouTube. Afterward, the moderator steered the discussion based on a pre-defined discussion guide that included questions about how participants access and select the videos; the types of elements, such as channel, number of views, titles, and thumbnails, that they take into account in their selections; search engine usage; their general opinion about the platform and its recommendation system; the identification of fake news or any bias; and the daily use of YouTube.

The following section shows the results obtained through the three techniques: the survey, the sketches and diagrams, and the focus groups.

4. RESULTS

According to our survey, YouTube is an important platform in their daily life. Although it is commonly used for entertainment, its functionality exceeds casual viewing by far. For example, the platform is also used for formal or informal learning, to obtain operational information in everyday life, and to shape viewpoints about the world. For some users, video production has also become a source of alternative income.

Here, we must understand that there is no single YouTube user model. Users access the platform for their own purposes based on previous knowledge and their intuitive

theories about its operation. Among our respondents, we identified three general user types: "produsers" (Bruns, 2008), who consume but also produce or have produced videos; regular consumers, who watch videos primarily for entertainment purposes; and consumers interested in social and political content, who use the platform to keep themselves informed on current issues such as sustainability, feminism, violent conflicts, and social movements.

Each of these groups expressed different intuitive theories about the platform and evidenced different levels of agency and, therefore, different levels of resistance to algorithmic governance. Our findings are detailed below.

4.1 Intuitive Theories About YouTube's Operations

The diagrams evidenced different types of intuitive theories about YouTube recommendations. The first group, composed of users who access the platform for entertainment, supports a theory based on search criteria and the fundamental role of consumer users (Figure 1).

Figure 1

*Samples of Search-based and User-based Diagrams*
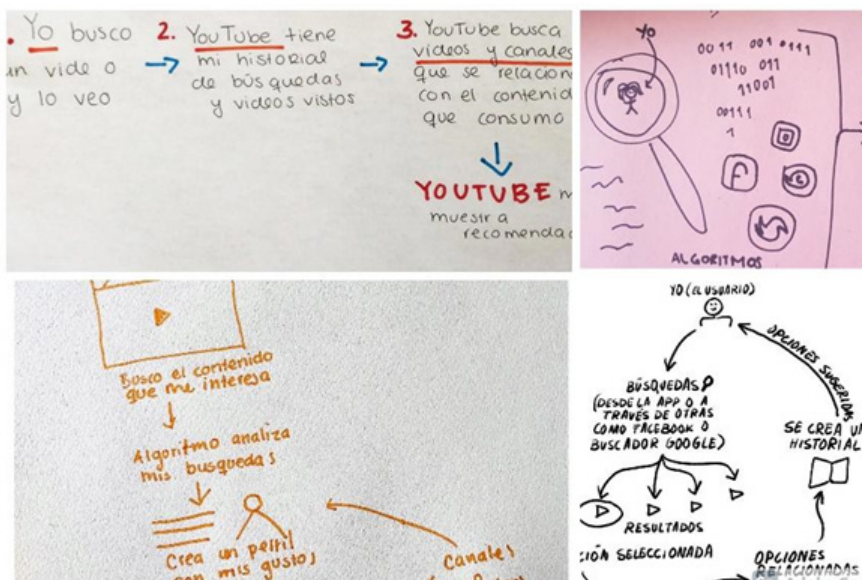
This group, which mostly includes users who watch videos for entertainment, identifies thematic searches as the input and platform recommendations as the algorithm's output . The elements identified by this group are the YouTube search engine,

the viewing history, and especially user search initiatives. Some sketches and diagrams include searches on other platforms but do not explicitly define how information is transferred between platforms. As a result, simplified visions emerge, corresponding to the significant role assigned to the search engine in the decisions about content; these assume a mostly personalized performance wherein the user is the main actor and the algorithmic processes and interests of the platforms remain hidden.

The second group built a multifactorial theory that recognized different input values for the recommendation algorithm: data collection inside and outside the platform, similar user preferences, subscriptions, and number of views (Figure 2). Although most users do not include the entire process of video production, diffusion/circulation, and consumption, these visions are less simplified than the ones provided by the first group and are associated with users interested in informative content.

Figure 2

Samples of Multiple Factor Diagrams
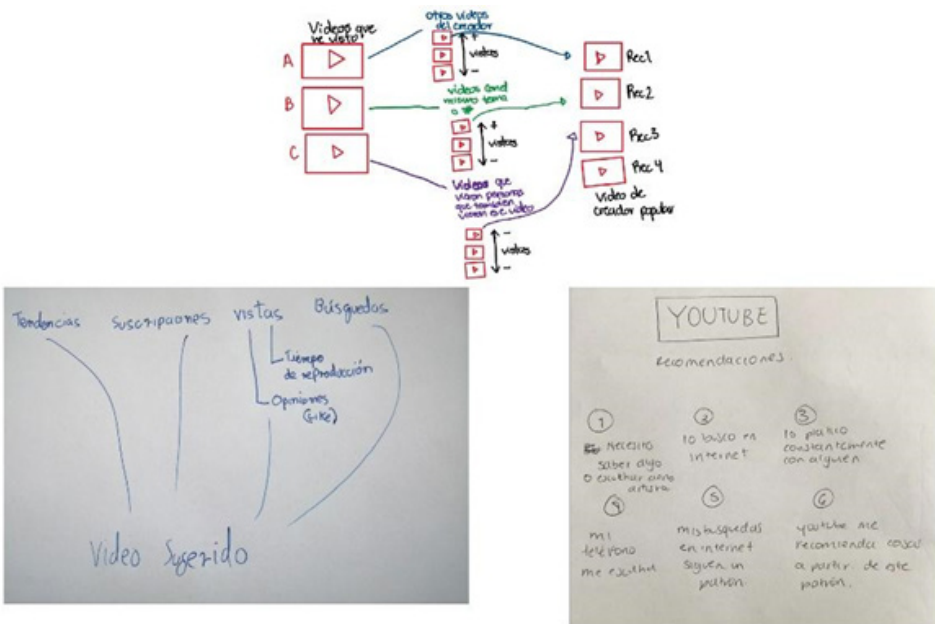
Finally, unlike consumers, the content creators' viewpoint includes video production instances and considers subscriptions more important than search criteria. Only a minority of our focus group participants incorporated the content creators into their diagrams when, in fact, they evidenced the most complex intuitive theory. This suggests that users familiar with video production perceive algorithmic governance more accurately.

The three theories described here attribute varying degrees of influence to interface elements regarding the production of recommendations. The first group considers that the interface is almost transparent and that algorithmic recommendations match user search criteria. The second group problematizes the role that user reactions and subscriptions play by linking them to the recommendations they receive. The third group, which includes content creators, adds the business interests of the platform to the other interface elements in algorithmic logic. We will revisit this difference in intuitive theories later as an explanatory factor for differences in agency since intuitive theories "organize experience, generate inferences, guide learning and influence behavioral and social interactions" (Gelman & Legare, 2011, p.380).

4.2 Perceptions of Algorithmic Governance

Users associate governance with different concepts (Figure 3). The central and most frequent concepts relate to non-personalized content on the user's home page, such as the trending topics tab, which includes breaking news or current events. Our respondents link them with the commercial and advertising interests of the platform. On the other hand, they mentioned having found offensive or morally questionable videos. The second group of concepts focuses on the lack of flexibility of automated recommendations compared to the dynamism of user searches. In this sense, recommendation systems are seen as rigid and not diverse. Suppose a user does a single search and watches one or two videos on a given topic. In that case, the platform displays several recommendations on the user's home page that either do not or no longer interest the user. The third aspect is the low quality of the recommendations and the lack of trust the recommended content inspires: "There is a lot of empty content that is not really going to help you at all, and sometimes you can fall into that trap and waste hours watching content that really does not help you at all." Finally, references to private data collected by other platforms, such as WhatsApp, Facebook, or Instagram, were collected. This surveillance dimension is coupled with an intuitive theory that personifies the platforms and materializes in statements such as "my phone listens to me," "I don't know how, but they always know what you like." We conclude that automated systems are perceived as unreliable and raise questions about their suitability as resources for expanding users' interests.

Figure 3

Algorithmic Governance Terms Measured According to their Frequency in Interviewee Discourse[1]
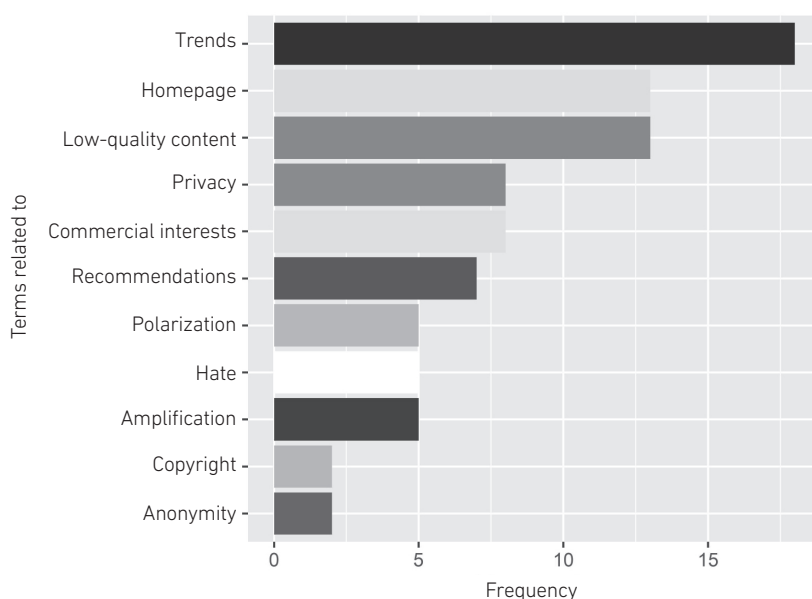
The algorithmic operations most commonly addressed in the critical literature, such as filter bubbles, algorithmic amplification, and disinformation, are frequently mentioned by users interested in political and social issues but less so by users who use YouTube for entertainment or as a learning tool. For example, users interested in crime-solving have been suggested videos glorifying murders or—when discussing religion— anti-Semitic and white supremacy videos. Users claim they found these videos relatively easily, and use several measures described below to compensate for the apparition of this content in their profiles.

There is also a distinction between produsers and consumers concerning algorithmic governance. The former mention demonetization actions, video removals, copyright claims, and other decisions made by platforms without prior notice to content producers. They also consider how the sale of advertising space shapes video content based on what is socially acceptable and familiarly visible and how the orientation and mood of video hosts change to comply with these requirements. These assertions are consistent with intuitive user theories: users who identify intermediation of user reactions by the platforms' commercial interests understand that these elements mediate automatic

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1   This figure is based on the assessment of co-occurring words in the direct discourse of respondents obtained using tidytext, an R-based text mining software (Silge & Robinson, 2016).

recommendations. On the contrary, users who associate recommendations directly with their searches perceive algorithmic governance to a lesser extent. The following section addresses the search process as an element of agency.

4.3 Agency

Roughly 80 % of survey respondents express that they are comfortable with the platform's recommendations and follow them regularly. Less than 10 % of our respondents claim to have frequently found misinformation in their profiles, but more than half report having found false information at some point.

The subject matter of the video triggers the search process. Once the subject has been chosen, different actions may be deployed. The most common is using the platform's search engine. The following criterion regards the video producer: if it is a known producer, if the producer seems a reliable expert, or if the user has already subscribed to the producer's channel. Secondary criteria related to the producer and the channel are the preview images, the number of views, the recommendations, and the frequency of notifications received by the producer and channel (Figure 4).

The decisions associated with a higher degree of agency are made at the onset of the process: selecting the subject matter, running the search engine, and deciding which video to watch. After watching the first video, users can easily yield to the associated suggestions provided by the platform. Contrary to the perception of the user's home page recommendations, which are considered elements of governance, the search engine is perceived as an element of agency wherein freedom of choice is exercised: "I only use YouTube to search for what I want to watch, and, from there, suggestions pop-up on the right sidebar. Sometimes I follow these suggestions, but I hardly ever watch the generic suggestions on my home page."

The search algorithm is often linked to the criterion of timeliness but not always to relevance. Once the recommendations have been received, users apply their own selection criteria. Elements like the channel or producer that publishes the video, subscriptions, and the number of views help users decide which video to watch.

In this sense, producers are more selective in the videos they consume; they consider the source of the video, its title, and its preview images. They know how to discriminate between serious information titles and videos only trying to increase their number of views. They place more trust in previews where people appear than in previews in which they do not.

Figure 4

Common Terms Associated with the Video Selection Process Measured According to their Frequency in Interviewee Discourse[2]
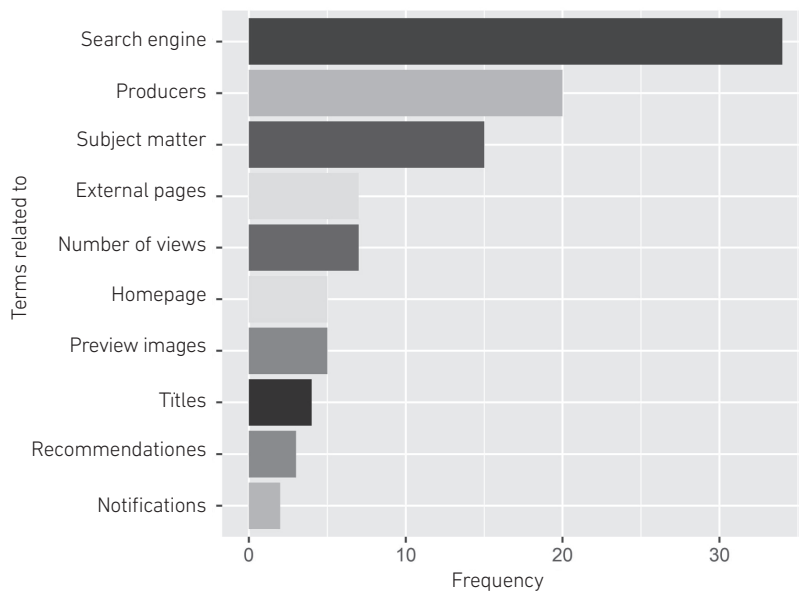
In general, they also acknowledge that among the many results that a search can yield, they ultimately select the videos with the most views. Our respondents also admit that this practice is detrimental to quality videos with fewer views. However, they use quantitative criteria to make their decisions.

4.4 Counter-Algorithmic Governance Strategies

According to Treré (2019), tactics are actions that, in a power struggle, allow the weak to negotiate, experiment, and adapt to power strategies. For our purposes, strategies are activities made by users to resist governance by seeking to influence recommendation algorithms in their favor.

We identified three different users' tactics to resist algorithmic governance. The first is to watch more videos posted by the channels they subscribe to if the home page recommendations do not match their permanent interests. The second is refraining from searching for temporary interests because automated systems quickly change home pages based on new searches. The third is the only tactic that seems to work

2   This figure is based on the assessment of co-occurring words in the direct discourse of respondents obtained using tidytext, an R-based text mining software (Silge and Robinson, 2016).

without subordination to governance, as it directly ignores the platform's insistent recommendations:

> for example, some right-wing videos have become very viral. Some guy arrives, sits at the table, and asks users to discuss it with him. I jumped in to see what was going on and quickly got frustrated. After a while, I realized that you can't argue with these people. And I didn't like the content. However, as of that moment, the algorithm clings to that and starts trying to insert that kind of content constantly. And it's something you have to avoid for quite a while. Well, I simply avoid these videos. In other words, I do not even watch them out of curiosity because I do not want the platform to constantly recommend that kind of content to me.

Some playful redefinitions of the data monitoring exercised by the platforms were also identified. For example, after explaining her feeling of being heard on her phone, a respondent states: "well, I'm already using it to my advantage. We've already started saying 'advertising', 'marketing,' 'Querétaro,' and then you get more of that. It is like you are also playing with the algorithm."

In addition, other users believe that, if they use the platform enough, they can ultimately "train" the algorithm to respond to their interests:

> I think that when you don't get into YouTube much, the algorithm is not trained or cannot understand you, so it gives you trends as recommendations. Then, you have access, but I'm not interested in beauty makeup. However, that's just because the algorithm hasn't seen or analyzed what I like yet.

When asked for proposals to improve platform interaction and the content offered, our respondents pointed out the need for deeper critical literacy to distinguish between reliable information and false, ambiguous, or offensive information.

According to Rieder et al. (2018), recommendation systems are sensitive to novelty and contingency. Recommendations change as soon as new searches are done. Nevertheless, based on the answers from our respondents, algorithms do not balance the stable and the contingent. Although users can ultimately align automated recommendations with their interests through the tactics mentioned above, they force them to spend more time on the platform and, in some cases, refrain from looking for new information, or remaining within their content bubbles. These tactics work for some users but fail to resist governance because they follow the algorithm's operating logic: less content diversity, little introduction of new topics, and, in some cases, spending more time on the platform.

5. DISCUSSION

This work has evidenced the experiences of a group of young YouTube users with algorithms based on their intuitive theories about the platform, their perceptions of algorithmic governance, agency, and the algorithmic resistance tactics they employ. Our findings demonstrate that users do not wholly subordinate themselves to algorithmic governance and find effective tactics to resist governance and exert their own agency.

For the users interviewed, agency is motivated by the following factors: First, different intuitive theories about how YouTube works promote different actions. Users who develop intuitive theories considering the incidence of user reactions in terms of likes, views, shares, and subscriptions, as well as the commercial interests of the platforms embedded in their automated recommendations, exhibit greater agency capabilities and are better posed for developing resistance tactics. On the other hand, users with more reductionist interpretive theories directly associating the video search process with platform recommendations tend to subject themselves more to automatic playback. Second, different use configurations allow for the development of different agency models. In this study, users who develop resistance tactics mostly use YouTube for information purposes and content production, In contrast, users who mostly access YouTube for entertainment are commonly less aware of platform mediation when recommending specialized content. Third, much of the users' agency derives from the exercise of critical knowledge about the platform, its elements, and the video producers. Agency strategies include trusted channel subscriptions, assessing the different paratextual video elements such as titles, preview images, number of views, and comments, and the verification of their production sources. Users also identify the algorithmic distortions recognized by the literature reviewed as part of this study, such as the filter bubbles studied by Pariser (2014) and Kaiser and Raufleisch (2020), content intensification as identified by Tufecki (2018), as well as differentiating algorithm dominance to render certain class and race attributes invisible, as verified by Bishop (2019).

Tactics include preferring content from channels to which users have subscribed to clear out their home pages of unwanted recommendations, refraining from making contingent searches to prevent diverting the algorithms from permanent interests, or directly ignoring the recommendations on the home page. Our findings also reveal that the search engine is the main element of agency, followed by subscriptions to preferred channels. Verifying video sources is the most commonly used resource to build information trust, but our respondents admit they lack elements to distinguish reliable from unreliable information. These tactics demonstrate that users may indeed resist algorithmic governance and that not all content consumed is imposed by algorithmic governance. According to Velkova and Kaun (2021), as users expand their algorithmic experience, they are freed from tragic narratives in which algorithms completely control them.

However, these tactics and practices are few compared to the complexity of the algorithmic operations exhibited by the platforms. From the standpoint of our respondents, algorithmic governance materializes in non-personalized content, the invasion of privacy, unwanted advertising, a lack of content diversity leading to polarization, and a lack of information about content reliability. Future studies must determine the larger-scale effects of algorithmic governance. The platform's search engine and subscriptions to trusted channels, as well as critical information assessment and the knowledge of the distortions and biases of automated recommendations, are basic weapons for resisting algorithmic governance, as well as for YouTube to obtain some interpretative flexibility on behalf of its users (Pinch & Bijker, 1989).

In line with transmedia literacy, our findings lead to an accurate identification of the skills required to achieve algorithmic literacy as defined by Ridley and Paulick-Potts (2021). First, awareness of the complex operations of recommendation systems reveals the commercial and political interests of the platforms. Second, the distinction between the functions of different platform element in terms of user possibilities will grant more agency and freedom of action. In other words, focusing on user-defined search criteria can be more efficient in terms of agency than relying on automatic playback or homepage recommendations. Third, the paratextual video elements allow critical evaluations that can reinforce decision-making. Acknowledging that algorithms are not neutral artifacts can generate user tactics to circumvent distortions, biases, and lack of diversity. Finally, technological appropriation based on video production provides users with a more complex view of how platforms work, including elements often overlooked by consumers. Some of them are monetization, the influence of commercial interests in the selection of themes by producers, and the dependence on platform criteria to create sustainable content channels. Our study respondents acquire transmedia literacy in informal environments and through experience and practice (Cruz Sánchez, 2019; Hernandez y Hernandez et al., 2019). This study confirms that they do implement certain tactics and skills (Scolari, 2016), such as criticism and observation. This study's contribution is to identify these methods and skills, which may then be leveraged to create formal literacy programs (Lugo, 2016).

In this sense, the homogeneity and size of our sample offer certainty that these statements are valid for a group of university students sensitized to intensive digital platform use and assert that the greater the knowledge of the platform interfaces, the greater the possibility of developing resistance tactics against algorithmic governance. However, our sample also constrains us from extrapolating our findings to all types of YouTube users due to its homogeneity. In this regard, further studies involving other age groups and different academic levels are required to delve into the algorithmic experiences of different types of users whose perceptions of governance and algorithmic resistance tactics can vary. This work provides guidelines for conducting these studies in the future.

6.   CONCLUSIONS

This work determined to what extent users subject themselves to or otherwise resist algorithmic governance in content recommendations. Our results reveal that users are not completely subordinated to platforms. Their freedom of agency varies depending on their different modes of technological appropriation, their intuitive theories about platform operation, their capability to prevent algorithmic distortions, and their resources for evaluating the quality of the offered information. Our assessment identified specific skills that constitute algorithmic literacy, as part of our results.

Future studies will conduct the same analysis on other social platforms to determine agency possibilities within a digital environment with increasing automation.

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