

# Algorithmic Personalisation Versus Informational Diversity. The Instagram User's Perception

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## ABSTRACT

The contemporary information ecosystem, dominated by social digital platforms, has undergone a major transformation in how users access and consume content, largely due to the growing integration of algorithms. These computational systems act as gatekeepers that filter and reorganise information according to logics that anticipate and shape user preferences. Although algorithmic personalisation offers convenience, it raises significant ethical and democratic concerns regarding the plurality of voices and free access to information. This study examines the guiding question: “What perceptions do Instagram users demonstrate about the relationship between algorithmic personalisation and information diversity?” The objective is to evaluate users’ levels of awareness and criticism regarding the impact of algorithms on news consumption, contributing to a broader understanding of how automated systems structure information flows and influence access to diverse perspectives. A mixed-methods approach was employed, combining a questionnaire (n=114 valid responses) and semi-structured interviews (n=11). This design captures how users perceive algorithmic influence on their informational experience and the degree to which they feel their informational freedom is affected. Findings reveal a central paradox: although users acknowledge algorithmic personalisation as part of their everyday digital experience, they demonstrate limited understanding of its broader consequences for information diversity and the potential erosion of pluralism. Despite recognising the influence of their interactions on the content they receive, their critical comprehension remains superficial. The study contributes to human–computer convergence research by demonstrating how user behavior is shaped by systems operating under technological monopoly and centralised control, constraining autonomy and challenging the foundational principles of transparency and agency in human–computer interaction.

**Keywords** Algorithmic literacy, Instagram, Algorithmic personalisation, Human-computer interaction, Informational freedom

## INTRODUCTION

The current configuration of the new communication ecosystem is marked by automated systems – algorithms – that filter, classify, and reorganise the information available on the network. Digital platforms such as Instagram are no longer spaces for social interaction and entertainment, but have become infrastructures for information distribution, where the logic of operation

culminates in conditioning how platform users perceive and construct their interpretations of news reality.

Algorithmic personalisation, as presented by Instagram (Instagram Creators, 2024), optimises the experience by adapting to each user's preferences and needs. However, this same personalisation raises a strong contradiction: the more they seek to satisfy individual preferences, the more they tend to reduce exposure to divergent and pluralistic content, thereby restricting access to multiple informational perspectives, and compromising the principle of informational diversity (Pariser, 2011; Gillespie, 2014).

For this reason, the algorithm does not act as a purely neutral tool, but rather as an active mediator, whose function is to redefine the flows of information by producing invisible hierarchies of relevance and scope of topics (Bucher, 2018; Beer, 2017). Thus, algorithmic gatekeeping is gradually replacing traditional journalistic editorial criteria. Algorithmic mediation turns it into a technical, automated process in which the decision-making logic for relevant content is based on the number of interactions (likes, shares, or comments), to the detriment of the public value of the information and its relevance to society. This new dynamic raises ethical, political, and epistemological questions about how users of this platform understand the relationship between algorithmic personalisation and information diversity.

Having presented the problem, this research aims to understand Instagram users' perceptions of the relationship between algorithmic personalisation and information diversity. The relevance of the study lies in identifying the degree of algorithmic literacy among Instagram users – that is, determining whether they have the skills to recognise and interpret the algorithmic presence, and to react critically to the influence of these automated systems on the construction of public opinion and meaning. To contribute indicators of Instagram users' levels of awareness, this study aims to encourage reflection on the impact of algorithmic models on freedom of information in digital social networks, which is understood as the right to produce, access and disseminate plural and reliable news information, free from technical mediation criteria that are, in most cases, driven by behavioural and/or commercial criteria inherent to the platform itself.

## **ALGORITHMS AND INFORMATION DIVERSITY IN NETWORKS**

Technically, an algorithm is defined as an abstract description of a computational process (Dourish, 2016), which operates on a set of rule-based codes that regulate communication as they adapt to changes in data (Lomborg & Kapsch, 2019). However, in the digital environment, algorithms are seen as dynamic, changeable processes developed by human beings operating in social, cultural, and political contexts (Wilson, 2016). It follows that these systems are the invisible infrastructure that reorganises feeds, hierarchising the available information and influencing interactions, leading users to follow their instructions, consciously or unconsciously (Gran et al., 2020).

To understand how Instagram works, four particularly relevant types of algorithms stand out: (i) Recommendation (suggest content based on

preferences – Yu et al., 2016; Elahi et al., 2022); (ii) Ranking and prioritisation (determine order and visibility by relevance – Gasparetto et al., 2022; Belcic, 2024); (iii) Moderation (monitor and restrict the circulation of content - Griffin, 2023; Gorwa et al., 2020); and (iv) Amplification (increase the visibility of content with more engagement - Narayanan 2022; Bass, 2023; Lum & Lazovich, 2023).

The highly personalised content mediation generated by these algorithms has significant implications, including the Black Box Effect, the Bubble Effect, and Echo Chambers, which will be explained below.

### **Black Box, Bubble, and Echo Chamber Effects**

As has been increasingly discussed, social networks are equipped with algorithms that perform different functions and mediate the content circulating on them. This reality has significant implications for users' navigation. It raises ethical questions about phenomena such as the black box effect, which affects users' daily lives, albeit in an almost imperceptible way. This phenomenon describes the opacity of algorithmic functioning, whose code and operational mode are incomprehensible to the average user due to their technical complexity (Burrell, 2016). In addition to the lack of technical knowledge among social network users, who are not concerned with the machine's programming issues, there is also the absence of interest on the part of companies themselves in revealing the coding processes they execute, intentionally concealing the rules of their algorithms, whether for economic or political interests, or even as a way of protecting their revenue model. However, this intentional concealment amplifies users' misunderstanding of the criteria for selecting, prioritising, or amplifying the content they are exposed to on social networks, increasing their distrust of these platforms. In addition to not knowing the 'how' and 'why,' network users are subject to phenomena that limit their access to diverse information, driven by algorithms. This happens thanks to phenomena such as the bubble effect, a concept coined by Pariser (2011), which is explained as a 'personal and unique universe of information' in which algorithms restrict and condition access to information that challenges or questions the beliefs and interests of platform users. This process, which the user does not choose because it is automatic, creates excessive personalisation, restricting the information diet to which one is subjected (Pariser, 2011).

At the same time, there is the phenomenon of echo chambers, defined as microenvironments where opinions, beliefs, and even political tendencies are reinforced through repeated interactions among peers with similar attitudes (Cinelli et al., 2021). This effect, amplified by algorithms but related to human behaviour on networks (Zimmer et al., 2019), increases polarisation and reinforces perspectives that can become dangerous to the democratic information environment by promoting cognitive isolation and limiting information freedom by conditioning information flows on networks.

## **Freedom of Information and Challenges in the Digital Age**

Informational diversity is understood as a fundamental right inherent to freedom of information, enshrined in the Universal Declaration of Human Rights (UDHR) and the European Convention on Human Rights (ECHR), which enshrines the right to seek, receive, and impart ideas and opinions without restriction. These standards, established several years ago, must align with the functioning of networks, since they are no longer just a space for entertainment but also relevant to the dissemination of news, which is essential to the proper functioning of a democratic society. The Portuguese Charter of Human Rights in the Digital Age (2021) clearly reflects the need to adapt these concepts to the online environment, reaffirming that all individuals have the right to express their thoughts, share and obtain information freely and without censorship, even in digital environments.

However, social networks operate according to technical logic and depend on computer mechanisms programmed by people and guided by algorithms (Gillespie, 2014), which challenge the democratic precepts of freedom of information. While traditional media (print, radio, and television) are guided by extremely rigorous editorial principles, such as news value, which ranks the importance of information based on its relevance and timeliness, social media operate in a completely different way. The first significant transformation within Instagram's content architecture is the shift from a chronological display of posts to an algorithmically driven relevance-based system (Chaykowski, 2016; Levin, 2016; Teknotícias, 2016). This change not only hinders understanding of the context of issues, as a publication released two or three days ago may suggest, but also makes it impossible to rank news items, thereby diminishing their value. Thus, this new algorithmic gatekeeping, which operates in a hidden and opaque manner, fosters the emergence of inequalities driven by the evaluation of behavioural profiles constructed by algorithms through the continuous collection and analysis of users' interactions and personal data, as well as by the commercial interests of companies and of the Instagram platform itself. As a result, these dynamics give rise to a highly individualised and fragmented informational environment, even within a seemingly networked space.

## **Algorithmic Literacy and Resistance Strategies**

Understanding algorithmic literacy as a fundamental skill is one of the most essential pillars for navigating social media. Algorithmic literacy is not merely a technical knowledge tool; it is also the ability to critically and consciously question and evaluate the information to which one is exposed on social media (Shin, 2022). Its absence may be the main factor contributing to the spread of mass disinformation through increased fake news, reinforcing the phenomena described above (bubble effect and echo chambers) due to users' lack of skills and resistance strategies.

Algorithmic literacy is the skill that enables users to adopt and implement algorithmic resistance strategies, tactics that subvert the logic of the system and mitigate the risk of falling prey to algorithmic effects (Chung, 2020; Zenkl, 2024). In the studies analysed, it is understood that the motivations

for algorithmic resistance include awareness of adverse effects, which occurs when the user becomes aware of the algorithm, as well as frustration at the lack of control, which becomes evident when the user recognises that the network is imperative when it comes to decisions about the content it disseminates (Chung, 2020; Zenkl, 2024). To mitigate these effects, some studies in the field recognise resistance strategies that users are beginning to implement, which include: selective interaction (unfollowing certain accounts, interacting only with desired ones); obscured resistance (practising false behaviours to confuse the algorithm); and the strategic use of algorithmic amplification itself (manipulating the system through the saturated use of hashtags) (Devito, 2011; Xie et al., 2022; Bonini & Tereré, 2024). Therefore, the acquisition of algorithmic literacy is directly linked to perceptions of information diversity on the network, with more educated users being able to detect these phenomena more easily as soon as they occur.

## METHODOLOGY

This study employs a mixed-methods approach, integrating survey data with subjective perceptions from semi-structured interviews, inspired by Grounded Theory (Corbin & Strauss, 1990).

The questionnaire, consisting of 26 questions—25 closed-ended and one open-ended—aimed to assess Instagram users' perceptions of the influence of algorithms on news consumption. The eligibility criteria required participants to be users and consumers of news on the platform. In total, 104 valid responses were collected. The survey was disseminated through social media, academic professors, and institutional networks.

Eleven semi-structured interviews were conducted to explore users' perceptions in depth and investigate contradictions revealed in the survey, capturing discursive nuances, emotions, and subjective opinions more fluidly. Participants were selected using a convenience sample technique supplemented by the snowball method (Coutinho, 2014). The sample comprised three defined profiles: ordinary users, communication academics, and journalism professionals. The qualitative data collected were analysed and coded using the Taguette software.

## RESULTS

This section presents the findings focusing on Instagram users' perceptions regarding algorithmic personalisation and information diversity.

Of the 104 respondents, 91.2% reported consuming news on the platform, with consumption levels as follows: 43.3% occasionally, 28.8% frequently, and 14.4% daily. The primary news sources are official media pages (76%), followed by algorithmic suggestions (51%) and digital influencers (48.1%).

Regarding the alignment of content with personal interests, 20.2% of respondents reported that the content they consume is fully aligned with their individual interests and habits, and 33.5% reported it as partially aligned. A significant paradox emerged: while 63.5% of respondents initially stated they have access to diverse information on social media, a subsequent

detailed inquiry into the diversity of perspectives revealed that 45.2% consider the content to be moderately diverse and 31.7% consider it not very diverse. Furthermore, a large majority of respondents (91.4%) recognised that their previous interactions on the platform influence the content they consume.

In evaluating algorithmic recommendations, negative views (27 thematic references) outweighed positive views (21). While some participants considered personalisation useful for displaying relevant content, the general sentiment was one of dissatisfaction with the information's bias. The data also reveal a desire for control: 46.1% of participants believe that users should have complete autonomy over their personalisation preferences.

Qualitative data from the interviews revealed a strong awareness of algorithmic influence on Instagram (54 thematic references), with the algorithm frequently classified as a restrictive filter (70 thematic references). The perception of informational autonomy was predominantly negative, evidenced by 28 thematic references in the coding unit 'lack of informational autonomy' compared to 8 highlights for 'full informational autonomy'. Participants also highlighted Instagram's low credibility as a news source (39 thematic references).

## ANALYSIS AND DISCUSSION OF RESULTS

Cross-referencing empirical data with the theoretical framework reveals an apparent tension between algorithmic personalisation and the right to informational diversity on social networks.

### 1. The Personalisation-Diversity Paradox

The data highlighted a significant dissonance in user perception: although 63.5% of users claim to have access to pluralistic information perspectives, 91.4% recognise the influence of their previous interactions. This strong recognition demonstrates practical knowledge of the algorithmic influence. Yet, it coexists with an overestimation of the actual diversity they encounter. This discrepancy, which is accentuated in the results, reveals that although there is an awareness of the algorithm's performance and presence, the critical understanding of information diversity is quite limited.

The survey responses, especially in the open-ended question, show that users' idealised aspiration for freedom of information—envisioning an ecosystem free of censorship and algorithmic filtering—clashes with the practical experience in which freedom of information is perceived as 'conditional' or 'absent'. This practical perception is rooted in the awareness of the algorithm's role as a gatekeeper (Gillespie, 2014), which compels users to follow its rules, consciously or unconsciously (Gran et al., 2020).

This dissonance of opinions reinforces the presence of the filter bubble phenomenon (Pariser, 2011), where the algorithm, by prioritising content personalisation based on users' interests (with 58.7% considering content partially or totally aligned with their interests), effectively limits access to a global spectrum of diverse information.

## 2. **Ambivalence and the Demand for Autonomy**

Algorithmic recommendations are viewed ambivalently: they are valued for their convenience and relevance yet are criticised for their bias and the reduction of information diversity. The data show that negative assessments outweigh positive ones (27 vs. 21 thematic references), indicating a generalised feeling of discontent. This dissatisfaction fuels a desire for autonomy, with 46.1% of participants believing they should have complete control over their platform personalisation. The algorithm is often understood as a restrictive filter (identified 70 times in coding), reinforcing the need for user agency.

## 3. **The Gap Between Awareness and Critical Knowledge**

The practical awareness demonstrated by the majority of the sample does not necessarily translate into a critical, conscious understanding. The study sample revealed confusion in distinguishing between the concepts of the bubble effect and echo chambers. This disparity between “knowing that” (awareness and presence) and “knowing what” (understanding the concept) aligns with Devito’s (2021) informal theorising, in which understanding emerges only from experience and is not complemented by consolidated theoretical knowledge.

This gap between formal and practical knowledge also aligns with the notion of algorithmic opacity (Burrell, 2016; Christin, 2020) and reinforces the feeling of loss of control over the platform itself. The data further suggests that algorithmic literacy is unevenly distributed, concentrated mainly among academics and communication professionals, likely due to a lack of training in interpreting the underlying algorithmic languages.

## 4. **Behavioural Deficit and Resistance**

This study also reveals that algorithmic literacy is a fundamental skill, but its behavioural dimension (know-how) remains very limited. Although 47.1% of respondents reported actively trying to resist algorithmic effects (albeit occasionally), 22.1% admitted they would like to know how to do so but lacked the necessary knowledge. The interviews confirmed this lack of personal strategies for algorithmic resistance (highlighted only 17 times), primarily among communication professionals/academics. These results reflect a gap between awareness and the behavioural dimension (knowing how to resist and mitigate the effects of algorithms actively).

## 5. **The News Overload Paradox**

Given these findings, the observed massive consumption of news on Instagram, despite the platform’s general lack of credibility as a news source, presents a paradox. This paradox can be explained by Park’s (2019) news overload concept, which leads users to rely on the network’s filters and the suggestions they receive, even while questioning the quality and accuracy of the information. Consequently, algorithmic literacy is a necessary tool for users to transform their passivity and inertia into autonomy, enabling them to resist the automated logic of platforms.

## PROPOSALS FOR ALGORITHMIC LITERACY STRATEGIES

Given the perceived deficit in information diversity – recognised by network users as a consequence of algorithmic operation – and the demonstrated widespread interest in educational initiatives to mitigate these systemic issues, the following proposals for algorithmic literacy strategies were developed. These strategies aim to enhance informational autonomy, aligning with the FATE (Fairness, Accountability, Transparency, Explainability) model suggested by Shin (2022):

- 1) **Platform transparency**, a critical component highlighted by Burrell (2016) and institutionalised by regulatory frameworks like the Digital Services Act (DSA-EU), must be effectively communicated to the public, for example, through media reinforcement.
- 2) **Creation of interdisciplinary research groups** - Similar to the EU's disinformation observatories, it is essential to establish interdisciplinary research groups dedicated to studying the influence of algorithms on news dissemination and consumption. By connecting academia with ordinary users, these groups could enhance media literacy and raise awareness of algorithmic impact on society.
- 3) **Diversification of user interactions** - As Devito (2021) suggests, users should be encouraged to diversify their interactions with the platform. Each engagement feeds the algorithm, so varied and unpredictable behaviour broadens users' informational exposure and reduces the risk of echo chambers and filter bubbles.
- 4) **Active recognition of content, i.e., awareness** - Following Chung (2020), users should reflect on *why* certain content appears in their feeds. This awareness promotes critical thinking and transforms users from passive recipients into active participants, fostering algorithmic resistance and conscious digital behaviour.
- 5) **Creation of open educational practical guides** - Based on the empirical findings, open educational guides should be developed to explain how algorithms shape information exposure. Projects like "Who Targets Me" illustrate how transparency tools can reveal algorithmic criteria, promote literacy, and empower informed user engagement.

In conclusion, the promotion of algorithmic literacy requires a holistic strategy that prioritises platform action, external regulation through legislative support, and community education grounded in academic knowledge, ensuring the democratic function of digital communities.

## CONCLUSION

This study confirms that algorithmic personalisation strongly shapes how Instagram users' access, understand, and interpret information. Although most participants view informational diversity as a fundamental right, its actual exercise remains constrained by automated systems that determine content visibility and relevance. Despite a high level of functional awareness—91.4% recognise that their interactions influence what they see—this



does not translate into solid critical understanding. Participants' knowledge is largely experiential, marked by limited comprehension of concepts such as filter bubbles and echo chambers, indicating that algorithmic literacy remains superficial and insufficient to support effective resistance strategies. This is reflected in the fact that 22.1% wish to counter algorithmic influence but lack the skills to do so, perpetuating exposure to homogeneous information flows and increasing polarisation. Instagram thus plays an ambivalent role: it is widely used for news consumption (91.2%) yet perceived as unreliable, illustrating dependence on platform-driven filters as a response to news overload (Park, 2019).

These results underscore the need to strengthen algorithmic literacy, particularly in its critical and practical dimensions, so users can actively manage personalisation processes and regain informational autonomy. In this sense, the study contributes to the field of Human-Computer Convergence by showing how user behaviour is shaped by centralised technological systems that challenge transparency and agency. Enhancing algorithmic literacy therefore emerges as essential for preserving autonomy and pluralism in an increasingly opaque digital environment.

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