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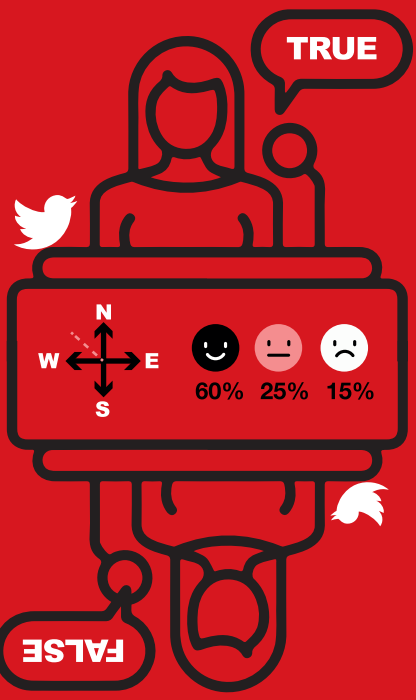

International political communication

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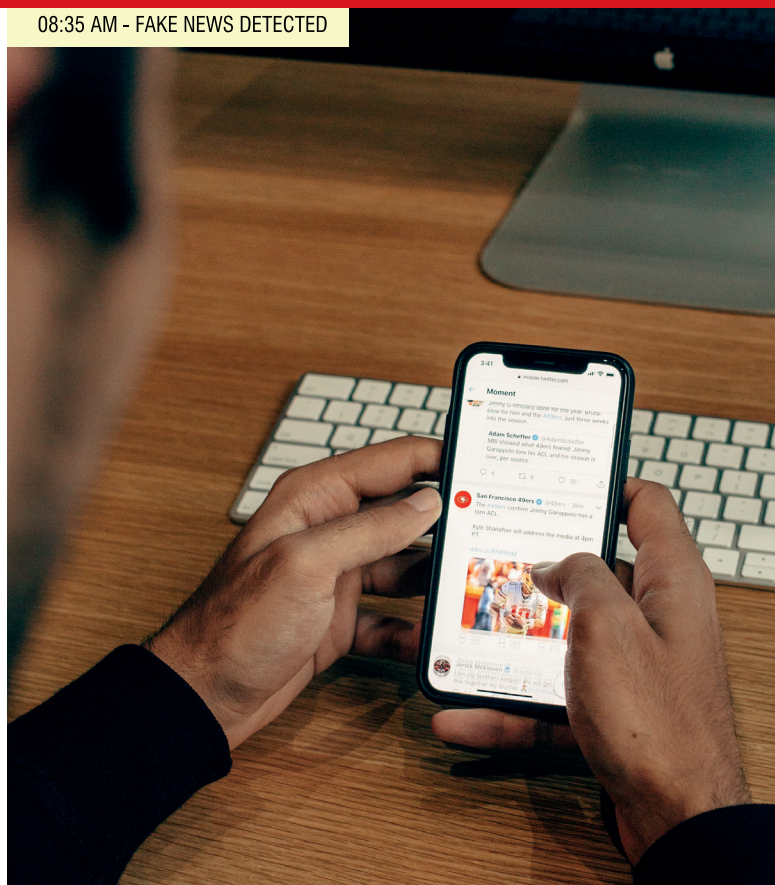

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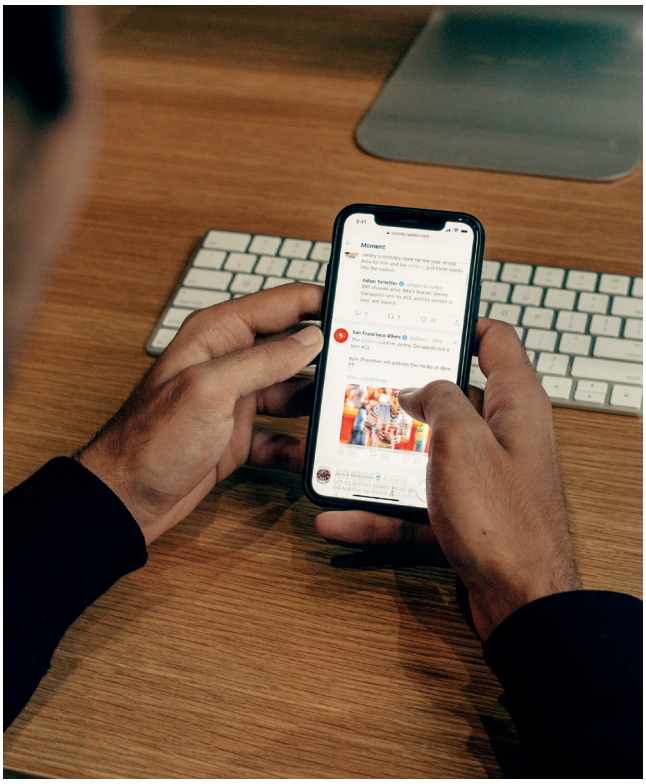

Digital literacy and technopolitics, core enablers in a disintermediated digital political communication age

Ana Pérez-Escoda; Maria-Raquel Freire

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Abstract

The growing interconnection of technology and politics and the enactment of particular political goals (technopolitics) has been closely articulated with emotions and the building of foreign policy narratives. In the current context of change in the communication paradigm, global and disintermediated, bringing together in the same digital space distinct actors, and having wide diffusion and reach, the challenges to international politics are diverse. Digital and media literacy are, in this regard, key to address the implications of these changes, avoiding the spreading of disinformation, fake news and distorted practices that might have profound effects at societal and political level. In this context, this paper aims at providing a basis for understanding the emerging and increasingly clear connection between political communication, polarization, disinformation, and emotions in social networks and digital literacy as a central factor explaining misuse or alleviating deficiencies, on the one hand, and how this context is affecting the reconfiguration of international relations and politics, on the other hand. The case of the war in Ukraine is illustrative of these trends and dynamics.

Keywords

Digital literacy; Political communication; Politics; Technopolitics; Disintermediation; Fake news; Democracy; International relations; Social media; Journalism; Ukraine's war.

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1. Introduction

(Dis)information and media discourses are reshaping politics and international relations in a more global and faster way than they used to. On par with the expansion of the digital realm in today's societies, recent events, such as the Covid crisis or the war in Ukraine, have profoundly affected relations and perceptions of security and politics across Europe. As many authors state "Information has been weaponized" (**Gerrits**, 2018), a process further increased by social media and digital communication. Within this context, the "entanglement of technology with politics" (**Edwards**; **Hecht**, 2010) and the centrality of emotions (**Hutchison**; **Bleiker**, 2014) have been particularly important. In these dynamics, the media, considered legitimate social actors to communicate current events to the public, have been adjusting to two key factors:

firstly, the change in the communication paradigm that has led to a shift in the communication flow between the distinct actors involved: media, governments, politicians, institutions and citizens; and, secondly, the rise of social networks where media discourses are exposed to fast diffusion and global reach (**Couldry**; **Livingstone**; **Markham**, 2007), and to the direct interventions of users who participate on an equal footing as prosumers (**Ritzer**; **Dean**; **Jurgenson**, 2012).

> "Easiness and flexibility in the distribution of information, combined with the capacity of any subject to generate information and interaction, led to a new era"

The discourse of public opinion and emotional appeal through social networking points to how the

> "collective dimension of emotions shapes social and political processes" (**Hutchison**; **Bleiker**, 2014),

and to the many new issues that have been nurtured, such as highlighted by **Munger** (2020): clickbaiting, filter bubbles, eco chambers, personalization of information, virality, reactivated more than ever by the role of disinformation and propaganda. Digital literacy (or the lack of it) is increasingly appreciated by academics as a significant factor to explain or avoid these issues (**Guess**; **Munger**, 2022) and, as an increasingly necessary process to avoid bad practices in information management and regarding fake news. According to authors such as **Mason**, **Krutka** and **Stoddard** (2018), this literacy effectivity begins within an in-depth understanding of the media fabric.

This communication framework has been characterized and framed by a scenario of disintermediation (**Katz**, 1998; **Parisi**; **Rega**, 2011; **López-Jiménez**, 2014) that has changed the nature of communicating itself, of how issues are built and potentially manipulated and reinterpreted, with huge impact on international relations (**Barnett** *et al.*, 2017). This has created a new state of affairs in which media and political discourses have been merged progressively in a digital and online scenario in which new agents have taken advantage of the different rules addressing the communicative ecosystem and altering international relations and the democratic sphere.

The analytical framework offered in this paper provides a descriptive analysis that leads to understanding the emerging relationship between digital literacy, political communication, and international relations. Starting with an overview of the communication paradigm shift, the article underlines how this change has influenced the relationship between political communication and journalism, the results of which, social media-enabled, are disintermediated scenarios of interaction that affect international relations. This context helps to deepen an analysis in which technopolitics and emotions are shown as drivers in the reconfiguration of politics and international relations, placing special emphasis on the case of the Ukrainian war as an example of disintermediation and technopolitics with President Zelenski's strategy in networks. The analysis finishes with an epigraph that shows the agreement between academia, the international sphere, and different European countries to promote digital literacy in the context of politics and international relations as a key factor in guaranteeing democratic processes, through a public opinion that knows how to read the context critically, and is aware of the digital, hyper-connected and disintermediated environment in which current political communication takes place.

2. When it all began: Change in the communicative paradigm

From media communication studies it results essential to analyze not only how the effect of communication on citizenship has evolved, leaving theories such as **Lasswell**'s (1927) hypodermic needle obsolete, but also the control of information traditionally supported by the agenda-setting theory (**McCombs**, 1992), or even by the emergence of new epistemologies explaining the phenomena, such as theories on collective intelligence by **Lévy** (2004), resulting from digital evolution towards a new cyberculture paradigm.

Trying to settle a very starting momentum of what has resulted in a new era, the term "net society" is already found at the beginning of the century (**Castells**, 2001) becoming the reference of a new paradigm, later defined by other authors as media convergence culture (**Jenkins**, 2006) or as a reinterpretation of McLuhan's media ecology (**Scolari**, 2015). This turning point meant an extraordinary social change in the emergence of a new media: the Internet, that will remain as the medium of the media. New technologies related to the Internet allowed the first substantial shift in the communication paradigm: easiness and flexibility in the distribution of information, combined with the capacity of any subject to generate information and interaction, led to a new era: the era of the prosumer –firstly foreseen by Alvin Toffler (**Ritzer**; **Dean**; **Jurgenson**, 2012).

In parallel, we find another phenomenon that explains the beginning of this change: Web 2.0 (**O'Reilly**, 2004), which constitutes the foundational architecture of the web as we know it today, characterized by algorithms and big data and on which the participatory and interactive philosophy of the Internet is based. Regardless of the numerous definitions found in the existing literature on the subject, what is most relevant is the coincidence in that the design of this architecture is user-centered, thus reinforcing the shift in the communication paradigm that gives a voice, capacity, and shared distribution tools to a global protagonist: the citizenry as a whole.

It is observed from this point that the traditional roles of media as legitimized information deliverers and audiences' influencers through their agendas have been definitively changed. Audiences disappear, transformed into users, and the media fade away as intermediaries of the information that remains as raw material for what **Ebersbach**, **Glaser** and **Heigl** (2008) called collective intelligence and **Jenkins** (2006) coined as participatory culture.

This gradual evolution, overcoming mediatization processes (**Schütz**, 2004) culminates, in the context of media studies, with the phenomenon known as disintermediation, affecting all sectors: social, communicative, political, democratic, educational, etc. Disintermediation, firstly coined by **Katz** (1998) is described in communication studies as the process

> "in which society stops channeling information through traditional media and begins doing it through the Internet" (**López-Jiménez**, 2014, p. 15).

> The intensive use of networks has consolidated disintermediation as a fundamental feature of the new communicative paradigm

Disintermediation finds its maximum level of application in social networks, the quintessential scenarios of participatory and networked culture, platforms where information circulates and users interconnect, the maximum embodiment of virtual communities and an already defining feature of our society, considered as "the fifth power" (**Pérez-Escoda**; **Rubio-Romero**, 2021). The global intensive use of these scenarios by individual users –turned into prosumers–, the media, institutions, politicians and governments and, in general, all kinds of social stakeholders, has definitely consolidated disintermediation, opening up the possibilities of free circulation and distribution of information towards all types of positive and negative practices (**Parisi**; **Rega**, 2011). Digital scenarios globally and virally increase Walter Lippmann's skepticism towards the media: bias, inaccuracies, or the lack of implicit truth, now developed into disinformation, infoxication, fake news, echo chambers or bubble filters (**Mcchesney**, 2013).

3. Political communication, journalism and social media as disintermediation scenarios

Disintermediation as a process of change has also affected political communication and international relations that encounter in social media valid scenarios for dialogue among primary stakeholders: politicians, heads of state, presidents and high executives talking directly to their audiences, generating interactions traditionally mediated by the media. This process directly transforms not only the long-standing traditional relationship between journalism and political communication, with technopolitcs (**Kurban**; **Peña-López**; **Haberer**, 2017) and digital political communication (**Sampedro**, 2021), but also puts an end to the established mutual negotiation model between both elites, politicians and journalists (**Casero-Ripollés**, 2008). The American elections process with Obama, Trump and Biden constitute fair examples (**Carpenter**, 2010). Moreover, they have strongly contributed to biases, manipulation, and also misinformation to a level not seen before, transcending the local and becoming global. According to Gerrits:

> "In international relations, disinformation and manipulation of information are instruments of foreign policy" (**Gerrits**, 2018, p. 5),

which not being new as a threat, acquires a concerning turn of greater magnitude due to the speed, reach and impact that social media allow as disintermediated scenarios in which the gate-keeper role provided by journalism has vanished.

In the last decade, both the casuistry and the literature on the role of social networks in political communication, the public sphere, the generation of opinion, polarization, bubble filters or echo chambers have been tremendously prolific due to the dimension of the phenomenon (**Casero-Ripollés**, 2022; **Couldry**; **Livingstone**; **Markham**, 2007; **Barnett** *et al.*, 2017; **Borge**; **Brugué**; **Duenas-Cid**, 2022; **Jungherr**; **Rivero**; **Gayo-Avello**, 2022). Authors such as **Chadwick** (2017) have described in a novel and thorough way how political communication has been increasingly transformed by the dynamics of digital media framed by continuous flows of information that break away from professional media routines. Perhaps the most novel contribution of the author, in line with the shift in the communication paradigm, is the new characterization of power, no longer centered on the media or political organizations, but on the user's interactions, interconnections and relational capacities provided by the network.

In this sense, the trinomial analyzed –politics-journalism-social media– has led to different interrelated phenomena that assist in describing the current communicative framework.

- Firstly, we can talk about a new style of citizen participation. **Vaccari** and **Valeriani** (2021) conducted an analysis of the role of social networks in the dissemination of political content and the promotion of political participation of citizens in nine countries. The study shows that social media offer a solution to what the authors call "diseases of democracy": the disconnection from politics and inequalities between those who speak out and those who remain silent. The authors challenge with evidence the most common and accepted beliefs about the role of networks in building echo chambers, bubble filters or fostering polarization, taking their analysis to the perspective of possibilities rather than disadvantages. Also, **Theocharis** *et al.* (2022) take up the importance of political participation fostered in networks, assuming that even though these are spaces where propaganda and disinformation are disseminated, they are also powerful scenarios for mobilizing and motivating citizens regarding their political commitment.
- Secondly, information manipulation, which is an "old story" as highlighted by **Manson**, **Krutka** and **Stoddard** (2018, p. 3), together with technologies unpredictably develops "fake news." The emergence of the Internet

> Disintermediation affects political communication and IR and thus disinformation at an unknown level that is transcending the local to become global

and social networks has radically changed media coverage, and fake news development understanding necessarily requires an explanation of the social communication dynamics imposed by these environments and the disintermediation entailed by them (**Jungherr**; **Rivero**; **Gayo-Avello**, 2020). The influence of media discourses in democracies, in political communication and in international relations becomes decentralized, breaking the top-down informational model that occurred with mediatization.

- Thirdly, it is important to note that the irruption of the user through the networks in the political-journalism relationship introduces a fundamental aspect in this analysis: emotionality as a distinctive feature that is related in public debate to phenomena such as polarization and filter bubbles (**Hutchison**; **Bleiker**, 2014). Emotionality, in public debate and related to political communication, implies that people are, firstly, more willing to seek and consume information that corroborates their own beliefs, and, secondly, more likely to dismiss information that does not coincide with their preconceived opinions.

4. Technopolitics and emotions as drivers for the reshaping of politics and international relations

The amplified effect of new media and communication strategies in international relations is widely acknowledged, with narrative-building at center-stage (**Miskimmon**; **O'Loughlin**; **Roselle**, 2014; **Barnett** *et al.*, 2017; **Bonansinga**, 2022). In the making of foreign policy, material conditions such as military capacities, economic performance or geopolitical considerations are fundamental, but insufficient to grasp the complexity of the decision process. Non-material elements, such as identity building, status-seeking and the shaping of narratives are also key (**Freire**, 2019). In fact, narratives embody representations that are both a reflex of understandings and of practices of interaction, building often

> "on a particular construction of self-identity in relation to the conceived identity of others" (**Jepperson**; **Wendt**; **Katzenstein**, 1996).

In this process, the context where interactions take place is socially constructed (**Wendt**, 1992), meaning it informs narratives' building, both reinforcing political positions and revealing their vulnerability. As such, narratives are

> "sense-making and sense-giving devices that structure information, establishing cognitive and normative maps to understand the political world" (**Bonansinga**, 2022, p. 4).

The way in which the construction of narratives takes place and is communicated is, thus, important, as processes of narrative manipulation might lead to disinformation and propaganda, reconfiguring politics and international relations in a fundamental way. Targeting certain audiences, bringing in "othering processes" ("us" versus "them") and gaining new forms of political legitimation or resistance and agency (**Rumelili**, 2011; 2015), narratives are a powerful media tool. The shift from Ukrainian friendly relations with Russia to a state of war since 2014 shows the reconfiguration of the identity narrative from "brotherhood" to "the other as enemy," is illustrative, implying Ukraine's adaptation of its system of meaning socially and politically. Political resistance to Russia came to reinforce Ukraine's national narrative as independent and distinct from that of Russia (**Freire**, 2020).

In the intertwined process of policy building and narrative construction and dissemination, language is power, and the ways in which we communicate are a form of power projection. Therefore, technology becomes an enhancer or blocker of certain narratives and perceptions associated with these. This implies that social media, echo chambers, big data, and national and international politics interact and are co-constitutive in narrative-construction processes. These can lead to dynamics of reaffirmation as well as of contestation, which can be amplified or silenced, and conveyed to inform or manipulate opinion. Certainly, these intermediated narratives in social networks affect policy choices and their implications (**Kurban**; **Peña-López**; **Haberer**, 2017; **Edwards**; **Hecht**, 2010), having in mind technologies are not per se technopolitics, it is

> "the practice of using them in political processes and/or toward political aims [that] constitutes technopolitics" (**Edwards**; **Hecht**, 2010, pp. 256-257).

Emotions need also to be brought into this picture as they are a fundamental part of international relations and foreign policy making (**Hutchison**; **Bleiker**, 2014). According to these authors, emotions are reflected in the way political issues are perceived, such as the emotional impact of the 9/11 terrorist attacks in the USA, regarding perceptions of national security, identity, and politics of legitimation. The role of "fear," "hatred," "humiliation," "anger" is part of the construct. Other contexts provide for solidarity emotions, like "empathy," "compassion," "respect," "dignity," such as a natural catastrophe like the recent earthquake affecting wide areas in Syria and Turkey. Others still invoke nationalist narratives to emotionally appeal to political support, building on public discontent and rallying on beliefs, with the war in Ukraine constituting a good example. These emotional approaches to politics conveyed through the media gain significance, and a new dimensionality in the public space when disintermediated scenarios are used, with capacity to influence democratic processes, as in the case of electoral processes mentioned before, and to deepen polarization, as never before. Although not new, narratives loaded by emotions have been gaining increasing space in the construction of political identities and programmatic objectives within the communication paradigm shift.

> "The influence of media discourses in democracies, in political communication and in IR is decentralized, breaking the top-down informational model that occurred with mediatization"

This articulation of social media, politics and emotions gives shape to social and political processes that might be reframed and reactivated through mechanisms of disinformation and propaganda, giving space and voice to certain actors and themes, and silencing others. In cases of violent conflict, **Reinke-de-Buitrago** (2022) argues there is a tendency to exaggerate positive narratives about "us" while also exaggerating negative narratives about "the other," implying an essentialization and emotionalization of othering in the dichotomy good and bad, as visible in the case of the war in Ukraine. The binary reality construction that results from representations like "right and wrong, truth and lies, information and propaganda" undermines the communication credibility of the "other" (**Simons**, 2018). Narrative manipulation in digital scenarios is, therefore, a central piece in this power game.

> Social media narratives are a powerful media tool to address the public and obtain new forms of political legitimization, resistance or intervention

The role of disinformation and propaganda in international relations is, thus, widely acknowledged as bringing fundamental challenges to international politics and particularly democratic processes. The rise in authoritarianism, strong leaders, polarization and the declining trust in political institutions, are some of the issues highlighted, with Russia's "anti-liberal wave" contributing to weaken western hegemony in the global sphere of information (**Gerrits**, 2018). Although not a new phenomenon, as argued, it has been amplified and it gained new dimensions in the media-politics interaction enhanced by technological evolution. Governments and international organizations have been taking measures to identify, control and resignify propagandistic and disinformation narratives, such as the case of the European Union's establishment of the *East StratCom Task Force* in 2015 to counter Russia's disinformation (*EEAS*, 2023).

In Russia, mirroring techniques and language appropriation in narratives (re)constructions are followed (**Baumann**, 2020). For example, the Doctrine on Information Security adopted in December 2016 underlines information manipulation as having clear impact on international security and stability, extending to Russia itself (**Gerrits**, 2018). The author further argues that the narrative of western pressure on Russian civilizational principles, traditional and moral values, is very much present in the doctrine, appealing to emotional attachment, and reflecting the understanding that information and communication are part of the toolkit in the Ukrainian warfare context (**Gerrits**, 2018). In this way, the war in Ukraine is representative of narrative-building, identity formulations and emotional appeals, coordinated with disinformation and propaganda, turning this complex conflicting and contestation scenario in an arena for information warfare. This entails technopolitics at the service of governments, intergovernmental organizations, private military groups, civil society organizations, with clear political goals, materializing propaganda "as a weapon of war, and disinformation as an instrument of foreign policy" (**Gerrits**, 2018). This is further analyzed in the next section.

5. Ukraine's war case: disintermediation and technopolitics with Zelensky

Russia's invasion of Ukraine on 24 February 2022 fully escalated the ongoing war raging since 2014, a time when violence broke out in the Donbass and Crimea was annexed by the Russian Federation. The shifting narratives seeking to gain legitimacy for political decisions and moves, have been marked by competing dynamics in fake news, disinformation and propagandistic narratives between Russia and the west, here the focus of analysis. In line with **Welch-Larson** and **Shevchenko** (2014, p. 277), the

> "risk that continued Russian bitterness over its loss of great power status"

after the end of the Cold War and dissolution of the Soviet Union, could

> "lead to a return of geopolitical competition"

was confirmed, and perceived humiliation and status dissonance clearly underpin twists and turns in Russia's relations with the west than more conventional power or interest-based explanations (**Welch-Larson**; **Shevchenko**, 2014). This confirms the importance of material and non-material readings of foreign policy and the role of media amplification of these.

The "reintegration" of Crimea in 2014, as claimed by the Russians, who understand this was the correction of an "outrageous historical injustice," through "powerful emotive words" (*BBC*, 2014) frames this very moment in historical and identity terms and brings emotions to densify the political narrative's appeal. This interpretation was opposed by western understandings that this was an act of annexation, illegal in light of international law. This same line of disagreement marks narrative exchange throughout this war. Dueling arguments put forward distinct visions of the war and the international order, with Russia claiming US hegemonic status undermines multipolarity and imposes a liberal-rules-based order, the Atlantic Alliance is a direct threat to Russia's security, the post-Soviet space is an integral part of Russia and of its collective identity imaginary, and status-seeking envisages the recognition of Russia as a great power. For the west, Russia's revisionist and militarized course seeking to overthrow the international order needs to be contained, Russia became the most important threat to European security, western institutions reinforcement and the legitimacy of the rules-based order need to be assu-

> Emotionality in politics transmitted through the media takes on a new dimensionality in disintermediated scenarios with the capacity to influence democratic processes

red. The clashing narratives become evident: they refer to the recognition of Ukraine's sovereignty, but also its denial; the "brotherhood" that unites the two nations, but also the "violence" that separates them translated in the "threat to compatriots" narrative (**Strycharz**, 2022); and that it is not the objective of the special military operation to occupy Ukrainian territory, however the referendums in Donetsk and Lugansk, and in the regions of Zaporizhia and Kherson led to the annexation of these territories by the Russian Federation.

> "Social media information is clearly disruptive, affecting perceptions and reinforcing contradictions, because of the speed, the wide reach and the difficulty of sorting out information from disinformation"

The media coverage of the war ingrains generally these distinct and conflicting narratives that have taken on a global dimension for a conflict transmitted through *TikTok* (**Chayka**, 2022). Western and Russian media immediately assumed opposite positions and activated collective imaginaries through propaganda and disinformation. The mirroring image is reflected on how for Russia disinformation aimed at undermining public opinion support for Ukraine, whereas in the west the opposite applied. Also, political elites in Russia are the main drivers of disinformation campaigns, as keeping a hold on information contributes to better control domestic audiences (**Oates**, 2016). According to **Pierri** *et al.* (2023, p. 65) Russian propaganda became

> "less prevalent after the invasion, following platforms' intervention, European sanctions on state outlets and Russian ban on *Facebook* and *Twitter*, but it did not disappear completely."

Low-credibility content showed a stable trend in the number of reshares and retweets, and a certain group of influential and verified *Facebook* pages and *Twitter* users shows that a handful of them accounts for 60-80% of all the reshares and retweets of problematic content (**Pierri** *et al.*, 2023, p. 65).

Interestingly also, the "propaganda fights and disinformation campaigns" cross-cut western and Russian discourse on the war in Ukraine, with the "othering" narrative fueling conflicting visions, as analyzed. Nevertheless, these conflicting representations from both Russia and the west used the liberal language as a reference point (**Baumann**, 2020), which allowed for successive dynamics of confirmation and denial in the interaction between these two conflicting parties. Moreover, **Gerrits** (2018) underlines that these disinformation campaigns did not really create divisions, they explored them to each own's advantage. And this process was reinforced by tweets, retweets, posts, likes, and shares, which amplify the message according to the audience it is targeting, following on the assumption that social media give space to many different voices from very different societal sectors. This means these processes are clearly disruptive, affect perceptions and reinforce contradictions, by the speed, wide reach, and difficulty in separating information from disinformation, facts-checking from propagandistic contents, but do not necessarily change "the international power balance," in the sense the power projection Russia aspires to has not been clearly realized.

The shift in the communicative paradigm flagged in the networks, with previous events such as the Arab Spring or the 15M in Spain, has been once again evidenced in the Ukraine's war by "redirecting political and military tactics" (**Morejón-Llamas**; **Martín-Ramallal**; **Micaletto-Belda**, 2022, p. 4). However, the development of the narratives surrounding this conflict includes specific issues that have marked significant differences from other conflicts that have strengthened the effect of disintermediation and technopolitics: President Zelenski's digital political communication strategy. The Ukrainian president has managed to move the war into social networks, generating

> "millions of interactions and content on the main platforms, where messages of support and calls for Ukraine's resistance multiply" (**Olivares-García**; **Román-San-Miguel**; **Méndez-Majuelos**, 2022, p. 2).

For the first time ever, he has led what has been called the first war on *Tik-Tok* (**Chayka**, 2022), although the President has inundated all social networks with content (*Instagram*, *Telegram*, *Facebook*, *Twitter* and *TikTok*).

It seems demonstrated, that the change in the format, the speed and ways of communicating through new media, has a clear impact in international relations, and particularly in foreign policy, in a double sense: on the one hand, with novelty and emerging digital narratives construction in the field of digital communication; and on the other hand, with disinformation and propagandistic campaigns directly consumed by the general public, allowing constant interaction and mimicking of voiced opinions and views, many times uncritically. In this way, the role of digital literacy has been gaining more space in the agendas.

6. Digital literacy and politics: a necessary binomial for a disintermediated scenario

The communicative paradigm shift described above, in which the citizen is a direct interlocutor of politicians and institutions in the network scenario, relevantly affects the political context and international relations, as has been analyzed in previous epigraphs. Disinformation and the affective polarization fostered in this network context become a phenomenon "we must learn to live with" (**Gerrits**, 2018, p. 13) either as an unavoidable burden of our technified and networked societies, which have amplified the propagandistic and manipulative phenomenon, or as a challenge in the face of an unstoppable transformation of paradigms with interesting possibilities for the political and communicative sphere (**Teacharis** *et al.*, 2023), as reflected in the Ukraine's war.

Regardless of the perspective adopted, many authors increasingly advocate the presence of media and/or digital literacy as a non-offensive but effective response to counter disinformation and polarization in the realm of politics (**Ashley**; **Maksl**; **Craft**, 2017; **Mason**; **Krutka**; **Stoddard**, 2018; **Guess**; **Munger**, 2022; **Polizzi**, 2019; **McDugall**, 2019; **Sun**; **Kai**, 2020) and what it entails:

> Digital literacy is increasingly present as a non-offensive but effective response to counter disinformation and polarization in politics

> "Education is the least offensive response, perhaps also the most effective, but, unfortunately, it is also the most difficult and time-consuming to respond to misinformation" (**Gerrits**, 2018, p. 14).

While earlier works put the focus on media literacy for civic and political participation (**Kahne**; **Lee**; **Timpany-Feezell**, 2012; **Ashley**; **Maksl**; **Craft**, 2017; **Kahne**; **Bowyer**, 2019), later works have already put the emphasis on how digital literacy is fundamental to democracy (**Polizzi**, 2019; **Salma**, 2019), including how it can be a decisive factor in international relations (**Gerrits**, 2018) that have also shifted their conversational arena to networks (**Barnett** *et al.*, 2017).

The relationship between digital literacy and political commitment has been highlighted by authors such as **Ashley**, **Maksl** and **Craft** (2017), or **Kahne** and **Bowyer** (2019). The concept itself evolved trying to embrace the impact of digital transformations that are consolidated around communication and politics. In this respect it is worth mentioning the critical digital literacy from **Polizzi** (2017), or what **Salma** (2019) points out, the need to integrate within the concept training about the current social and political structures, including technopolitics as an essential area, as a safeguard of democratic processes and in the fight against disinformation. More recent works such as those by **Olivares-García**, **Román-San-Miguel** and **Méndez-Majuelos** (2022, p. 4) propose content curation and fact checking

> "to overcome misinformation, contextualise facts and provide resources for media literacy."

Despite being one of the most frequently invoked concepts, finding an agreed definition of digital literacy is certainly complicated because it is a porous concept that often overlaps with others such as digital skills, media literacy or information literacy. In this case, we take as a reference the conceptualization proposed by **Guess** and **Munger** (2022) who related online political behavior to digital literacy in their study, taking the latter as

> "a crucial factor in online political behaviour whose role has been obscured to date by disciplinary practices designed for an earlier media-technological environment" (**Guess**; **Munger**, 2022, p. 114).

The authors take a dual conceptualization of the term: on the one hand, as the ability to discern information found on the web, and, on the other hand, combined with the basic digital skills needed to achieve it. While digital literacy is associated with the digitalization of information (**Glister**, 1997), media literacy is associated with media education, and both are currently combined in an attempt to respond to problems arising from the shift in the communication paradigm and media convergence, as described above. This is evidenced by authors such as **Kahne**, **Lee** and **Timpany-Feezell** (2012) when they speak of "digital media literacy" or **Polizzi** (2017) and **Santisteban**, **Díez-Bedmar** and **Castellví** (2020) when they propose a critical digital literacy.

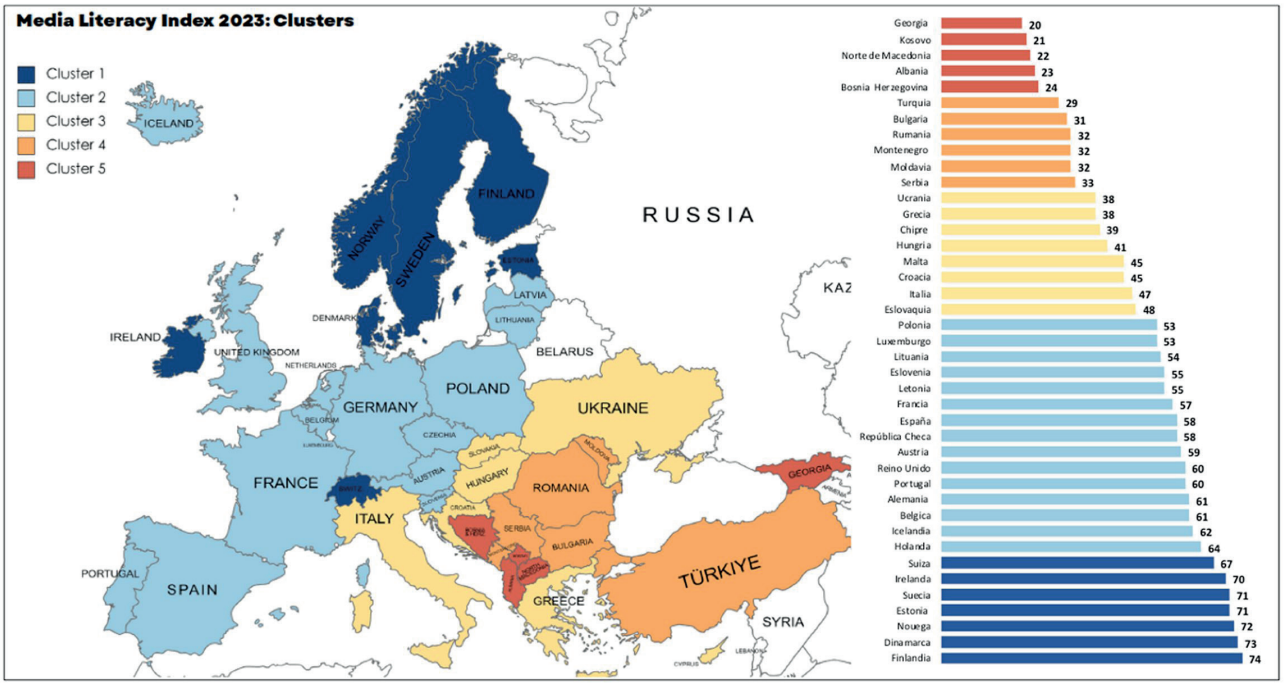
Outside the academic sphere, supranational organizations are also increasingly committed to the combination of digital literacy and politics. *Unesco* (2022), the *OECD* (2021) or the *European Commission*, which in the 2018 report by the *High Level Expert Group on Fake News and Online Disinformation* proposed, as one of the main recommendations, to promote media and digital literacy among citizens. Also, the *European Digital Media Observatory* (*EDMO*), created in 2020, proposed to motivate media literacy as a key element to counteract disinformation among its main actions.

In the political arena, different governments around the world have understood the importance of proper digital literacy as a guarantee of a citizenry that can properly exercise its freedoms, and whose lack does not endanger the democratic guarantees of an informed and critical public debate, which knows how to protect itself against disinformation and emotional polarization by being trained in the use of the digital context and its tools.

Examples illustrating these concerns can be found in the French government that expanded funding for online courses about the drawbacks of the Internet in 2015, providing 30,000 teachers and other educational workers with yearly training in the field of digital literacy (**Satariano**; **Peltier**, 2018). Additionally, the Italian government has strongly trained a new generation of students in safe Internet use as well as identifying fake news and conspiracy theories through class projects created by reporters in partnership with *Facebook*. Students in high school receive instruction on the political economy aspects of social media businesses, including information on how *Facebook* "likes" are politicized and monetized (**Horowitz**, 2017).

Despite a clear interest in the training of the youngest, there are countries with an extra concern in citizens' protection regarding international disinformation as an issue affecting internal politics. This is Finland's case, whose borders with Russia from 2014, when Moscow annexed Crimea and supported rebels in the East of Ukraine, made them understand that the war of disinformation was being moved to the Internet (**Mackintosh**, 2019).

> Digital literacy is fundamental to democracy and even a decisive factor in IR, which has also shifted its arena of conversation to networks



Graphic 1. *Media Literacy Index* in Europe. Elaborated from *Media Literacy Index 2023*

International concern in this regard is reflected in the annual –since 2017– *Media Literacy Index* report produced by the Bulgarian non-governmental organization *Open Society Institute-Sofia*. The report seeks to promote education according to legislation and measures not the digital literacy of each country but the predictors of media literacy, with the aim of ranking societies according to their potential for resilience in the face of post-truth, disinformation and misinformation. Its measurement methodology uses four types of indicators: media freedom, education, trust and new forms of participation (e-participation). Of all the countries (a total of 47) participating in the index, 41 countries are European (Figure 1) and 6 countries outside Europe: Australia, Canada, Israel, Japan, South Korea and the USA.

7. Final remarks

Political polarization and disinformation erode the ability of citizens to censor anti-democratic behavior (**Guess**; **Munger**, 2022) as demonstrated by academic works, the international context and the countries themselves with specific actions that relate both fields: digital literacy and politics. In this sense, digital literacy may act as a catalyst in the processes of polarization and disinformation that constantly take place in social networks, spaces from which the population is regularly informed, especially the youngest (**Pérez-Escoda**; **Pedrero-Esteban**, 2021).

It appears logical to assume that, if the scenarios of politics have also changed or amplified, as have other scenarios –educational, social, business, etc.– in which digital literacy is considered a fundamental tool for being efficient and effective citizens, it should also be considered in the field of politics, technopolitics and digital political communication in the same way. As this article has analyzed, narrative building is key to understand dynamics of legitimation, based on identity, status-seeking, and emotions, very much present in the case of the war in Ukraine. Technopolitics is the enactment of politics and technology with clearly defined political aims, where emotions constitute a catalyst to appeal to the audiences, and where disinformation might play a central role, as argued. Such narratives foster polarization and disinformation, and contribute to exacerbating understandings, mobilizing audiences and directly influencing willingness, foreign policy and international relations. This interconnection goes further in this analysis by looking at digital literacy as fundamental to address the challenges associated to these processes and how we can reply to those.

Therefore, the emerging connection between digital literacy and technopolitics finds, today more than ever, a profound sense in safeguarding democracies and guarantees for a trained population (**Tytova**; **Mereniuk**, 2022) that together with appropriate actions and policies in the field of critical digital literacy (**Polizzi**, 2019) ensures an informed population, permeable to the unstoppable changes that the use of technology imposes, regardless of the fact that the current information context is disintermediated.

> Digital literacy is a key tool for efficient and effective citizenship, also in the field of politics, technopolitics and digital political communication

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Use of generative artificial intelligence in the training of journalists: challenges, uses and training proposal

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Abstract

Artificial intelligence (AI) is already integrated into news production strategies in some media outlets. Recently, generative AIs such as ChatGPT and others have demonstrated their ability to enhance productivity in content production tasks, raising the question of how journalism faculties can address this new technology. This paper presents an academic study on the application of AI in higher communication studies. The study involved 4 in-depth interviews and 28 semi-structured interviews with university lecturers and researchers. The findings confirm varying degrees of convergence and divergence on different aspects of the technology, including the integration of AI in communication faculties, student training in AI usage, the introduction of AI and journalism as a subject area, and the potential uses of AI in news production and consumption. Additionally, this paper proposes a comprehensive training program on AI and journalism, focusing on its foundations, technical competencies and ethical considerations.

Keywords

Artificial intelligence; Journalism; Journalists; Communication; Interviews; Innovation; AI; Training; Teaching plans; Curricula; University studies; Higher education; Competencies; Skills; Ethics; *ChatGPT*.

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1. Introduction

Academic research on the application of artificial intelligence (AI) in journalism has been growing rapidly since 2008, with a notable surge in activity since 2015 (**Calvo-Rubio**; **Ufarte-Ruiz**, 2021). During this period, studies have explored various aspects of AI's impact on journalism, including innovation and new formats (**Meier** *et al.*, 2023), computational journalism and news production (**Vállez**; **Codina**, 2018), data journalism and big data (**Segarra-Saavedra**; **Cristófol**; **Martínez-Sala**, 2019; **Flores-Vivar**, 2019; **Herrero-de-la-Fuente**; **Llamas**; **Castillo-Lozano**, 2022), gamification (**Tejedor**, 2022) and fact-checking (**Canavilhas**, 2022; **Sánchez-Gonzales**, 2022), among others.

Another significant area of research in recent years has focused on the integration of AI in journalism education and its implications for the job market. Studies have examined training programs related to content automation (**Túñez-López**; **Toural-Bran**; **Cacheiro-Requeijo**, 2018; **Ufarte-Ruiz**; **Fieiras-Ceide**; **Túñez-López**, 2020; **Ufarte-Ruiz**; **Calvo-Rubio**; **Murcia-Verdú**, 2020) and identified research and teaching initiatives aimed at incorporating AI into communication curricula (**Gómez-Diago**, 2022).

However, a new generation of AI models, such as *ChatGPT*, *Midjourney*, *Dall-e*, and *Stable Diffusion*, has been able to reach the general public. 2023 has been a turning point for this technology, leading to a significant impact on society and resulting in the greater adoption of AI. Additionally, it has sparked a new debate regarding its inclusion (or exclusion) in the curriculum of Spanish universities.

It therefore appears necessary to examine the new generative AI models from an educational perspective, which is the basis of this research. The main objective of this study is to analyse generative AIs in terms of their relevance to journalism and education. Specifically, the aim is to provide an assessment of their impact and potential application in communication faculties. While the development of teaching plans may require time, it is crucial for communication faculties to acknowledge and address these changes of significant societal importance as they will likely have a broad impact on employability. Furthermore, faculties have the means to incorporate these emerging trends through their offerings, such as postgraduate courses and seminars. In light of this situation, the specific objectives of this research are as follows:

- To explore the perspectives of communication educators and researchers on AI in journalism and journalism education.
- To assess whether there is a consensus among professors and researchers regarding the integration of AI into the curriculum of communication faculties.
- To identify and propose a potential training model for AI competences in communication studies based on the findings from the previous objective.

2. Theoretical framework

Artificial intelligence is advancing rapidly and has brought about significant changes in our lives, a fact acknowledged even by organizations such as the *European Commission* (2020). This impact has also extended to the field of science, presenting both opportunities and challenges (**Stokel-Walker**; **Van-Noorden**, 2023; **Bom**, 2023).

In the realm of social sciences, particularly in the fields of communication and journalism, there has been a notable increase in AI-related studies since at least 2015 (**Calvo-Rubio**; **Ufarte-Ruiz**, 2021). Numerous works have explored various aspects, including automated journalism, perceptions and implementation of AI in the journalism sector, and its role in fact-checking and other journalistic practices. The presence of artificial intelligence in newsrooms has grown steadily (**Noain-Sánchez**, 2022), heralding a transformative era for journalism and media content (**Pavlik**, 2023).

Specifically, there have been studies examining how media providers can incorporate AI and algorithms as tools for processing large volumes of data and storytelling (**Furtado**, 2020). Other studies have focused on understanding the impact of automated news on media professionals (**Danzon-Chambaud**; **Cornia**, 2021; **Túñez-López**, 2021), the adoption of supervised machine learning in journalism studies (**De-Grove**; **Boghe**; **De-Marez**, 2020), news trust and credibility (**Sinatra**; **Hofer**, 2023; **Fletcher**; **Schifferes**; **Thurman**, 2023) as well as the challenges and debates surrounding automated journalism and AI research (**De-Lima-Santos**; **Salaverría**, 2021). Additionally, interdisciplinary research fields like software studies have examined the social and cultural implications of software, including its role in automated news production within journalism (**Dierickx**, 2023).

These debates and challenges have prompted the exploration of opinions from both the labour and academic sectors regarding the use of artificial intelligence in education (**Lim** *et al.,* 2023), particularly in the field of journalism (**Calvo-Rubio**; **Ufarte-Ruiz**, 2020). The needs of journalists when using AI tools in their daily news creation process have also been investigated (**Diakopoulos**, 2020). Furthermore, efforts have been made to develop AI literacy in journalism, addressing the ethical and social challenges associated with this technology (**Díaz-Campo**; **Chaparro-Domínguez**, 2020; **Deuze**; **Beckett**, 2022; **Herrero-de-la-Fuente**; **Llamas**; **Castillo-Lozano**, 2022) and combining humanistic knowledge with the handling of AI.

Additionally, various research studies have focused on journalistic innovation (**Lopezosa** *et al.*, 2023), the integration of AI in the development of new journalistic formats to cater to emerging user profiles (**Tejedor**, 2022), and the use of AI by fact-checking agencies for information verification (**Sánchez-Gonzales**, 2022).

It is evident that research on journalistic innovation, including the application of AI, has gained increasing relevance in the field of journalism (**Salazar**, 2020; **Meier** *et al.*, 2022). However, the research landscape has experienced an exponen-

tial shift following the introduction of generative AIs in 2023. This impact has not only been felt in the academic realm, but it has also had a profound effect on society, with indications that this trend will continue in the short and medium term (**Llaneras**; **Rizzi**; **Álvarez**, 2023).

All of this has confirmed, among other things, a growing commitment within the journalism industry to produce and distribute content supported by AI (**Ufarte-Ruiz**; **Murcia-Verdú**; **Túñez-López**, 2023). There is also an appetite to integrate AI into production routines, particularly in the information processing phases (**Sánchez-García** *et al.*, 2023). However, it is important to note that the use of AI in a field as uniquely human as journalism requires a socially responsible approach. Therefore, challenges related to quality, transparency, privacy, disinformation, and overall social development must be addressed (**Peña-Fernández** *et al.*, 2023; **Flores-Vivar**, 2019).

In any case, it is evident that while AI has been previously studied in relation to journalism, the emergence of generative AIs has highlighted the need to reevaluate the training necessary for future journalists to acquire proper knowledge of AI and to use it responsibly. This research aims to address this need.

3. Material and methods

To carry out this research, a comprehensive set of interviews was conducted in March 2023, involving a total of 4 in-depth interviews and 28 semi-structured interviews. These interviews specifically targeted communication lecturers and researchers who possess extensive knowledge and experience in the fields of journalistic innovation and artificial intelligence.

Table 1. Experts from the in-depth interviews

Interviewees	Justification for the selection of the expert	Questions
Clara González	Lecturer and researcher, involved in the development of the first course on AI and journalism scheduled to be launched during the academic year 2023-2024 at the *University of Navarra*	What inspired you to create this course on artificial intelligence and journalism? How do you believe artificial intelligence will impact the future of journalism and how should students prepare for these changes? What specific competences do you expect your students to develop through this course? Do you believe artificial intelligence can assist in addressing current challenges in journalism, such as misinformation or news avoidance? How should professionals prepare themselves for the ever-changing and evolving field of artificial intelligence?
Pavel Sidorenko	Lecturer and researcher, actively involved in the *ChatGPT Impact Project*, the first quantitative research project on AI in Spain, specifically focusing on *ChatGPT*	How do you believe artificial intelligence will impact the future of journalism and how will communication students be prepared to deal with these changes? What are the advantages of incorporating AI into the undergraduate education of communication students, and how can lecturers effectively utilize its potential to enhance the learning experience? What potential obstacles arise when integrating AI into university education, and how can educators mitigate these challenges to ensure effective learning outcomes? How can the integration of AI into the undergraduate education of communication students enhance their understanding and application of fundamental concepts in the field? In what ways can the utilization of *ChatGPT* enhance the ability of communication students to generate ideas, create content, and solve problems in journalism and communication?
Patricia Ventura	Trainer and specialist in AI, recognized as a prominent figure in promoting ethical practices in AI within the field of journalism. She provides training to journalists, educators, and organizations on ethics, artificial intelligence, and communication through the *Col·legi de Periodistes de Catalunya*. Furthermore, she authored the pioneering report on ethics, artificial intelligence, and journalism published by the *Consell de la Informació de Catalunya*	What do you perceive as the primary ethical challenges journalists encounter when utilizing artificial intelligence tools in their day-to-day work, and how should they approach these challenges? Do you believe that AI can assist communication students in improving their analysis and comprehension of information and media trends? How will communication students be equipped to navigate the transformations resulting from the integration of AI in newsrooms? Could you provide examples of artificial intelligence applications in news production and elucidate their impact on the quality of information conveyed to consumers? What technical and ethical proficiencies do you believe communication students should cultivate to effectively utilize artificial intelligence tools in the future?
Santiago Tejedor	Lecturer and researcher at the *Department of Journalism and Communication Sciences* at the *Universitat Autònoma de Barcelona*, he has a background in engineering. His research work on artificial intelligence and journalism has earned her prestigious recognition and awards	What practical applications of artificial intelligence do you believe are most pertinent to journalism, and how do they benefit prospective media practitioners? How should communication students be educated to comprehend and effectively utilize artificial intelligence tools in journalism? How will communication students be equipped to navigate the integration of AI into newsrooms? What are the major ethical challenges presented by the utilization of artificial intelligence in journalism, and how should they be tackled in educational settings? How can artificial intelligence aid journalists in conducting more in-depth and intricate investigations, and how can this be taught to communication students at the university level?

The initial phase involved 4 in-depth interviews with 4 participants. The purpose of these interviews was twofold: to gain a comprehensive understanding of AI in communication and to validate and refine the 5 specific questions related to artificial intelligence in communication studies. These refined questions were then used in the subsequent semi-structured interviews with the 28 lecturers and researchers who participated in the study.

For the selection of the 4 interviewees, we considered their exceptional expertise in the field of AI and communication (see Table 1). We also ensured that each interviewee had knowledge and experience in one of the following areas: AI and technology, AI implementation in newsrooms, AI implementation in communication universities, and ethical aspects of AI application in journalism. Based on their remarkable backgrounds, we developed specific sets of questions for each expert while including common questions, as indicated in the table below.

After conducting the in-depth interviews and analyzing their results, a set of semi-structured interviews was designed using the same set of questions for all participants. A total of 20 teachers and researchers from Spanish universities were interviewed, as indicated in Table 2. To ensure triangulation of the results, an additional 8 experts from Latin America were interviewed, as shown in Table 3. The selection of these experts took into consideration their professional profile as university lecturers and/or researchers, as well as the criteria questions principle (**Valles**, 2002), which considers factors such as relevant information, availability, willingness to collaborate, and communication skills. Furthermore, the selection criteria included:

- the interviewees had to have knowledge of journalistic innovation,
- they had to have developed some activity in their social networks on AI, and/or
- they had to have published some study on AI and journalism in academic journals These criteria resulted in a total of 28 interviews. Tables 2 and 3 provide detailed information about the interviewees.

Table 2. Subjects taught by respondents from Spanish universities

Interviewee	Subject(s) taught
1	Trends in Digital Journalism / History of Journalism
2	Cybermedia Theory and Analysis
3	Audiovisual Documentation / Audiovisual Culture / Communication Theory
4	Master's Degree in Journalism
5	Information Resources / Graphical Interfaces for Information Visualisation / Storytelling and Advanced Data Management
6	Communication Theory
7	Communication Theories / Cultural Cartographies/ Citizen Journalism
8	Fundamentals of Communication II
9	Analysis of Interactive Digital Communication
10	Journalistic Communication / Media Systems / Radio and TV Writing and Broadcasting / Theoretical and Methodological Basis of Research in Multimedia Journalism
11	Cyberjournalism / Investigative Journalism
12	Digital Journalism
13	Principles of Journalistic Design / Applications, Databases and Social Media for Research / Models and Genres of Cyberjournalism
14	Audiovisual Documentation and Online Communication / Social Media Management
15	Information Visualisation / Information Architecture / Multimedia Language and Technology
16	Computer Marketing
17	Political Communication
18	Personal Branding and Networking / Online Marketing
19	Journalistic Writing
20	International Relations / International Journalism / Broadcast Information

Table 3. Subjects taught by respondents from Latin American universities

Interviewee	Country	Subject(s) taught
1	Argentina	News Genres
2	Chile	Digital Tools / Design 1 and 2
3		Digital Journalism and New Media / Multimedia Journalistic Product / Viral Marketing and Social Networking
4	Ecuador	New Technologies in Education
5	Mexico	Journalism
6	Peru	Communication Theories
7	Portugal	New Journalism / Web Journalism / Broadcast Journalism
8	Puerto Rico	Journalism

In turn, the questions for the semi-structured interviews were designed taking into consideration the responses of the four experts (see Table 1), resulting in the identification of five questions that address five specific objectives (see Table 4). The interviews were requested and recorded via email. The results were then coded and analysed using the qualitative analysis program *Atlas.ti* (**Lopezosa**; **Codina**; **Freixa**, 2022).

Table 4. Coding: questions and objectives of the semi-structured interviews

Questions	Objectives/Categories
What is your opinion on the potential incorporation of AI technologies such as *ChatGPT*, *Midjourney*, *Stable Diffusion*, *Dall-e*, etc., in communication faculties?	(1) Incorporation of AI in communication faculties
Do you believe it is important to provide training for journalism students in using AI technologies?	(2) Training of students in the use of AI
Do you think there should be a dedicated course on AI and journalism in communication curricula? Why or why not?	(3) AI course in journalism: yes/no?
What specific AI-related skills and knowledge do you think journalism students should be taught?	(4) What skills should students be taught about AI and journalism?
In your opinion, how can AI potentially transform the production and consumption of journalism?	(5) Potential of AI on news production and consumption

Finally, based on the analysis of the results, a core model of AI competences in communication studies has been developed. This model incorporates the high and medium levels of perceived agreement from the responses of the 32 interviewees, which include the 4 in-depth interviews and the 28 semi-structured interviews.

4. Results

First, we provide an overview of AI in communication based on the findings from the in-depth interviews. Secondly, we present a synthesis of the semi-structured interviews, organized into 5 categories. Thirdly, we present an outline for a potential model for developing AI competences in communication studies. This model is based on the high and medium levels of agreement observed in the responses of the 32 experts (including 4 in-depth interviews and 28 semi-structured interviews).

4.1. Overview of AI in Communication

Regarding the findings from the in-depth interviews, we have not only identified the key questions that inform the development of the semi-structured interviews (refer to Table 3), but we have also gained an initial understanding, both technological and ethical, of AI in communication, particularly its applications to journalism and education.

Journalism has been significantly impacted by AI for several years now, particularly in areas such as automated text generation for weather information, sports results, and financial updates. AI is also utilized in relation to reader engagement and content recommendations, among other uses.

The challenges presented by AI and the importance of its use in a supervised and transparent manner is noted, emphasizing the idea of complementarity rather than substitution. Furthermore, it is crucial to provide AI with high-quality data, as poor design can lead to various biases. Privacy concerns related to the use of data also pose challenges, as media organizations increasingly gather more information about their readers and must ensure compliance with the *General Data Protection Regulation*. Lastly, it is noted that generative AIs can make errors, particularly when used for data gathering, highlighting the need for human involvement and robust verification processes in AI-based journalism.

In terms of the opportunities presented by AI in journalism, they rely on media organizations' ability to harness AI effectively to strengthen journalistic values. AI is already being employed for content verification and even to promote more ethical communication products, such as detecting self-reporting or gender bias. Notably, AI can be used to identify discrepancies in sentence lengths attributed to men and women or to analyse the gender representation in media by counting the use of images featuring women and men.

As for AI training, the creation of courses about artificial intelligence and journalism should consider the needs of both students and the journalism profession. It is evident that there are conflicting opinions regarding its implementation, leading to divergent perspectives. However, there is a consensus that introducing the reality of AI and its vast potential to the academic field can greatly benefit future journalists.

It is important for students to be able to utilize these resources to their advantage and approach such innovations with an open mind and a willingness to learn. The training of communication students necessitates interdisciplinary collaboration, bridging the gap between technical fields (engineering, computer science, etc.) and social disciplines (linguistics, psychology, etc.). Above all, it presents a valuable opportunity to uphold and reinforce core journalistic values and practices. Additionally, it is crucial to differentiate between the various applications of AI and understand its taxonomy. Ultimately, one of the objectives of creating a course on AI and communication is to shift the perception of AI from being seen as a threat to being utilized by students to enhance their future work, whether it be in data journalism, fact-checking, editing, and beyond.

Even so, there is a recognition of the need to approach AI responsibly and ethically, which gives rise to certain ethical challenges, particularly related to authorship, content, and its boundaries. While it is true that artificial intelligence can assist journalists in conducting more comprehensive and intricate investigations, a key aspect will be effectively managing vast amounts of data, cross-referencing variables, and identifying specific elements to humanize this data and transform it into compelling stories.

This implies that communication students will need to develop technical and ethical competencies to effectively work with artificial intelligence tools. These competencies would include understanding aspects of designing prompts, handling spreadsheets, as well as differentiating between artificial intelligence, machine learning, deep learning, and other related concepts, and utilizing them successfully. Additionally, they will need to grasp the responsibilities associated with using AI, such as critical thinking and decision-making when choosing AI applications to enhance the quality of journalistic output.

After summarizing the results of the in-depth interviews, we will now proceed with the findings from the semi-structured interviews. To present these results, we will divide them based on the categories that were established.

4.2. Incorporating AI in communication faculties

The analysis of the 28 semi-structured interviews has confirmed a high degree of consensus regarding the incorporation of artificial intelligence in communication faculties. Some participants view it as an inevitable necessity, while others believe its implementation is highly necessary, and some consider it to be a positive development. The underlying rationale for this stance primarily revolves around the importance of staying up to date with technological advancements and imparting this knowledge to students, recognizing that AI will become an essential tool in journalistic work. However, they acknowledge the challenges associated with integrating AI into curricula and anticipate that younger lecturers will likely play a significant role in incorporating these topics into their courses.

Some interviewees expressed reluctance regarding the introduction of AI technologies in the classroom. They believe that the potential and implications of incorporating these technologies into university education should be thoroughly evaluated. They suggest that before integrating AI into communication faculties, a fundamental update of the curricula will be necessary.

Likewise, there are two trends in the incorporation of AIs in communication faculties. On one hand, there is the opinion that they should be integrated in a comprehensive and interdisciplinary manner, promoting their understanding and utilization across various subjects. On the other hand, there are those who believe that AI should be specifically incorporated into dedicated courses focusing on its application in journalism.

Even so, regardless of whether AI is implemented directly or in a cross-disciplinary manner in communication faculties, it is generally acknowledged that given the communication trends and the continuous use of AI as a resource by students, it will be necessary to provide guidance and support for conscious and comprehensive utilization. This includes fostering a debate on the ethical and responsible application of AI in communication and journalism, explaining the use of AI from a critical perspective rather than solely an instrumental one, and advocating for rigour and transparency. It is important to highlight not only the benefits of AI but also the potential biases that may arise.

4.3. Training of students in the use of AI

In general, interviewees believe that journalism students should receive training in the use of AI technologies. In fact, according to the majority of respondents, students should have knowledge of how these technologies work and the impact they have on journalism. This includes understanding the changes in production routines, the business models of platforms that utilize AI, and the legal and ethical boundaries associated with its use.

The predominant reasons for training students in the use of AI are that these tools can enhance various aspects of journalistic practice and are likely to be in demand by media companies in the near future.

As interviewees acknowledge, AI technologies have already reached a level of professional and popular use, not limited to engineering experts. Therefore, students should not ignore them. In fact, it is crucial for students, in particular, to stay informed about technological advancements and incorporate them into their academic and professional growth.

Additionally, some interviewees believe that communication students should not only be familiar with the functionalities of AI and the data sources it utilizes but should also understand that, currently, it serves as a writing tool rather than a means of documenting or contextualizing facts, as AI still produces inaccuracies.

Finally, it is acknowledged that the learning of AI technologies should be integrated alongside other digital tools, including the use of machine translators, *Wikipedia*, or word processors.

4.4. IA and journalism subject

The widespread agreement regarding the potential for AI training in various areas of the curriculum does not necessarily indicate unanimous agreement on the need for specific subjects on AI applied to journalism. There are three predominant viewpoints among lecturers and researchers: those who believe that an AI and journalism course should be introduced, those who believe it should not or that it is still premature to implement it, and those who advocate for AI to be incorporated in a transversal or complementary manner within other communication subjects.

As for those who advocate for the creation of an AI and journalism course, they justify their stance by emphasizing the emerging trend that suggests the need to adapt and coexist with AI. They believe that the increasing use of AI will lead

to its rapid integration into communication departments, making knowledge of this tool a fundamental and essential requirement in various professional roles, particularly those related to communication. They argue that incorporating AI as a standalone subject is the ideal way to thoroughly investigate and explore its contributions (both advantages and disadvantages), professional standards, and ethical implications in journalism. Furthermore, proponents of this position highlight the existence of successful implementations of such subjects. Notable examples include the *University of Santiago de Compostela*, which offers a course titled "Automated Journalism: Theory, Technique, and Applications," and the upcoming launch of an AI and journalism course at the *University of Navarra* during the 2023-2024 academic year.

On the other hand, those who believe that an AI and journalism course should not be created, or at least not now, argue for caution. They raise several points: firstly, modifying curricula is not a simple task; secondly, AI technology still has many limitations and challenges to overcome; and thirdly, the rapid and exponential evolution of this field in recent months adds uncertainty. Instead, they suggest that AI content should be integrated into relevant subjects or topics as needed. However, a potential challenge lies in ensuring that each lecturer is adequately prepared to incorporate this content into their courses.

Under this last premise, there is a third perspective held by interviewees who advocate for a cross-cutting approach to teaching AI. They suggest implementing the study of AI within broader subjects that provide context and theoretical foundations, such as information technologies or cyberjournalism. This approach would ensure that the subjects themselves stay updated. Additionally, some interviewees propose integrating AI content into curricula related to content production, such as journalism or advertising classes, considering that AI is still in its early stages. They suggest that specific subjects dedicated to AI could be developed at a later stage, once the technology stabilizes.

4.5. What should students be taught about AI and journalism?

From the results of the interviews, various areas of knowledge have emerged that can be taught in the classroom. However, there is a strong consensus regarding the importance of addressing ethical considerations arising from the use of AI in journalism. Therefore, one of the core aspects of AI education is centred around promoting responsible and critical use of AI.

Furthermore, we have identified two fundamental dimensions and three key topics that encompass the knowledge to be acquired about AI in the classroom. The fundamental dimensions pertain to AI as a resource and teaching tool, as well as AI as a journalistic source. The three topics specifically related to AI encompass understanding the technology itself, its potential and possible biases, and its application within the field of journalism.

In addition, the interviews confirm the importance of teaching students not only how these tools work at a professional level, but also how to engage with them responsibly, utilize them for practical professional activities, and foster a critical mindset towards their use.

More specifically, students should acquire a foundational understanding of various skills, such as searching for and selecting news, fact-checking, generating automated text, creating images, graphics, and videos, tailoring news content to meet audience needs, and distributing news effectively.

Finally, based on the interviews, we have confirmed the importance of explaining the fundamental principles of generative AI to enable effective collaboration in multidisciplinary teams, where the technical aspects are primarily handled by computer experts rather than journalists. It is crucial to teach students about the existence of AI and its potential applications in communication, particularly in journalism. However, it must be emphasized that AI can never replace the role of a journalist due to ethical considerations and the need for professional rigour.

4.6. Potential of AI in news production and consumption

In general, the interviewed researchers agree that AI has the potential to bring about significant changes in the production and consumption of journalism. However, there is a stronger consensus that these changes will be more pronounced in the production phase rather than in consumption.

There is a general acknowledgment that the transformation is already underway in newsrooms and will continue to increase in the medium term. Therefore, the focus now should be on analysing the disruptive effects and finding ways to guide and harness the application of AI in journalism. It is crucial to adapt the profession to ensure responsible usage, address concerns, and prevent the precariousness of the field. AI cannot replace good journalism.

Furthermore, there is a high level of agreement among the interviewees that the transformation will impact the entire journalistic process, encompassing areas such as documentation, production, and distribution of news. It is expected that AI will play a crucial role in achieving economic sustainability, building audience relationships, and improving efficiency.

Similarly, some of the interviewed experts believe that AI is likely to be utilized in various functions within newsrooms, either in auxiliary or leading roles. These functions may include data and information collection, managing large datasets, assisting in editing, and organizing information, composing certain journalistic pieces, and validating information to combat disinformation. Journalists must remain vigilant against the potential misuse of AI, which can include manipulation, misinformation, and generating noise.

To summarize its potential in newsrooms, AI is seen as a tool rather than a replacement for current journalism practices. However, if used correctly or incorrectly in the future, it could bring about significant changes in production and distribution processes, leading to a redefinition of journalistic production standards and directly impacting professional training.

> The challenges presented by AI and the importance of its use in a supervised and transparent manner is noted, emphasizing the idea of complementarity rather than substitution

Furthermore, the experts interviewed believe that AI will also have an impact on news consumption. It is expected that audiences will receive more and better information, with a greater level of personalization. However, the use of this technology may also affect people's trust in the information they consume if media outlets fail to implement transparency measures. Therefore, it will likely compel media organizations to implement strict controls and precautions against disinformation.

4.7. Training recommendations

Finally, based on the analysis of the 32 interviews (4 in-depth and 28 semi-structured), a possible training model has been compiled in Table 5 that includes the most important competences, objectives, and topics of study in AI and journalism that were identified. This is a foundational outline that can be incorporated into a more comprehensive curriculum. It should be noted that this outline will need to be tailored to specific requirements such as the expected teaching load, mode of delivery (e.g., standalone subject, postgraduate training, specialized seminars), and other relevant factors. While the outline presents the core components identified, the specific implementation details will need to be thoughtfully considered within each educational context.

Table 5. Proposed core training scheme in AI and journalism

Competences	Objectives	Topics
Substantiation	To understand the origins, development, and current state of AI applied to journalism.	Types of AI and distinctions between artificial intelligence, machine learning, and deep learning
		Origin and evolution of AI
		Basics of algorithms
		Impact of AI on the media ecology
		Different types of AI and their applications in supporting journalistic work
Technical competences	Develop skills in content production, including familiarization with common programs and tools, as well as the nature of the work involved.	Description and use of AI tools
		Prompts design and learning specific techniques for creating written, graphic, and audiovisual content using AI, followed by the "post-production" phase where subjects must review, refine, and improve the results generated by AI
		Identification of reliable information through AI: employing search tools, data cleaning, processing, verification, analysis, etc.
		Data visualisation tools in the context of AI
		Analysis of case studies of media organizations utilizing AI resources
Ethical competences	Acquire skills in understanding the ethical implications and values associated with AI in journalism.	Introduction to the ethical challenges posed by these new methods of constructing reality
		Responsible use through critical thinking and decision-making when selecting AI tools to enhance the quality of journalistic output
		Interpret and critique the potential biases of AI and its application
		Critical analysis, copyright, and legal considerations within the context of AI use

5. Discussion and conclusions

Thanks to this research, we can provide an initial comprehensive assessment of generative AI in the journalism sector, particularly its potential application in the training of future journalists. This expands on previous studies conducted in Spain, primarily by Calvo and Ufarte (**Calvo-Rubio**; **Ufarte-Ruiz**, **2020**; **Ufarte-Ruiz**; **Fieiras-Ceide**; **Túñez-López**, 2020; **Ufarte-Ruiz**; **Calvo-Rubio**; **Murcia-Verdú**, 2020; **Ufarte-Ruiz**; **Calvo-Rubio**; **Murcia-Verdú**, 2021).

Therefore, it is important to present an initial framework, supported by relevant theory, that can assist curriculum developers in addressing the impact of generative AI. This framework can guide them in considering its implementation in future curricula in the medium term, or exploring more immediate responses such as seminars or postgraduate courses.

Furthermore, by revisiting the objectives of this research and assessing their achievement, we can identify the following noteworthy elements:

O1. The opinions expressed by the experts interviewed, including both the 4 in-depth interviews and the 28 semi-structured interviews, have provided diverse and valuable insights into generative AI and its implications for the media, particularly its potential application in communication studies. These interviews have allowed us to gain an overview of AI in journalism, explore its integration into communication faculties, and, ultimately, comprehend its impact on news production and consumption. This objective reinforces findings already addressed in previous studies, such as the

reinforcement of journalistic values (**Peña-Fernández** *et al.*, 2023), the ethical use of AI by the media (**Ventura**, 2021), the future of journalists (**Codina** *et al.*, 2022), or the use of AI for automated fact-checking *in* news (**Thorne**; **Vlachos**, 2018).

> The analysis of the 28 semi-structured interviews has confirmed a high degree of consensus regarding the incorporation of artificial intelligence in communication faculties

O2. There is no consensus among the lecturers and researchers interviewed regarding the integration of AI into the curriculum of communication faculties. Three positions can be identified in this regard. The most widely accepted position is that AI should be included as a standalone subject, followed by a more conservative stance suggesting its integration across subjects that require it. Finally, there are those who believe that it is still premature to incorporate AI into journalism education. However, all of them emphasize the importance of ethical and responsible use, aligning with the prevailing trend in recent research on the topic (**Sok**; **Heng**, 2023; **Kasneci** *et al.*, 2023; **Liebrenz** *et al.*, 2023; **Lopezosa**; **Codina**, 2023; **Sabzalieva**; **Valentini**, 2023).

O3. It has been possible to present a training proposal for AI and journalism that focuses on three main pillars: foundations, technical competencies, and ethical competencies. These training recommendations align with recent studies on AI training in various fields of knowledge, thus reinforcing the findings of other researchers in this area (**Halaweh**, 2023; **Mhlanga**, 2023; **Liebrenz** *et al.*, 2023, among others).

In short, this work aligns with the dual approach proposed by the *European Commission* (2020), which emphasizes both excellence and trust in the field of AI. This framework promotes a thorough understanding of the potential of AI and encourages professionals, including lecturers and researchers in the field of communication, to develop the necessary skills to utilize AI to its fullest potential.

Furthermore, this research aims to serve as a foundation for the responsible development and integration of generative AI into communication curricula. It aligns with proposals put forth by other studies published in 2023, which recommend teaching AI in a manner that upholds the integrity and accountability of the education sector (**Mhlanga**, 2023; **Kasneci** *et al.*, 2023) and, of course, ensures an inclusive, equitable, transparent, and ethical use of AI (**Sok**; **Heng**, 2023; **Halaweh**, 2023).

In conclusion, the research presented in this study complements previous investigations on the intersection of AI, journalism, and training, while addressing a specific gap in the literature by focusing on generative AI. However, it is important to acknowledge certain limitations in our study. Firstly, we have chosen to concentrate on Ibero-American experiences and specifically on university training, which means that results may vary in studies that involve experts from other countries. Additionally, this research follows a qualitative approach, and therefore, it does not allow for the measurement or calculation of the extent to which perceptions or opinions are shared among the entire population. However, our work serves as a valuable starting point for future quantitative studies that aim to explore this dimension.

Furthermore, the findings of this study are closely tied to a rapidly evolving field, considering the continuous emergence of new generative AIs from major players like *Google* and *Facebook*, among others. Additionally, the future regulatory framework governing the use of AIs, currently being developed by governments, adds another layer of complexity. As a result, future research should aim to examine this evolving context in order to expand knowledge and gain a more comprehensive understanding of the impact of generative AIs.

As for limitations, it should be noted that our research has primarily focused on training aspects. Future studies could explore specific dimensions or emerging developments of AI in journalism, such as the application of AI in news verification.

Nevertheless, one of the most notable findings from this study is the recognition of the importance of ethical and transparent use of AI, along with the integration of critical thinking in both its application and its teaching. Furthermore, there is a strong emphasis on the need for AI utilization to align with journalistic values and contribute to the enhancement of journalism as a whole.

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Beyond *Erasmus*. Communication of European Universities alliances on social media

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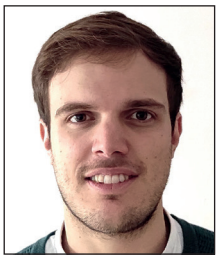

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Abstract

The European Union has suffered several problems in recent years, which triggers a proactive action by its institutions to generate a united citizenry and awareness of the importance of the EU. In the field of higher education, the *European Strategy for Universities* born in 2019 aims to strengthen and developed a common university system. The *Erasmus* program has traditionally been identified as the main driver of integration, but the emergence of European universities may mark a new phase in the shaping of the *European Public Sphere* (*EPS*). In this sense, social media are the key communication tool for higher education centers. The objective of this work is to examine the activity on social media of the 40 consortia of European Universities belonging to the first and second calls. First, the presence on the different social networks of these entities is analyzed to establish a map of the alliances, based on the number of social networks used, the volume of followers, the coordinating university and the year of the call. After identifying *Twitter* as the most used network, a content analysis is carried out on 12 variables of all the messages published by these consortia since their creation, with the aim of determining whether the content published on their *Twitter* accounts is professional in tone. The results reveal scant interactivity that does not take advantage of the potential of social networks. However, there is a certain influence of the national cultures in terms of use of digital platforms in the different countries that head each consortium, with Spain and France being rather remarkable in this aspect. Likewise, the advantage acquired by first-generation consortia boosts their greater impact. This leads to a reflection upon the true transnational dimension of the communication implemented by these universities.

Keywords

European Universities; European alliances; Institutional communication; Branding; Social media; Social networks; *Twitter*; Content analysis; *European Commission*; European public sphere; *Erasmus Plus*; European Union.

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Accountability

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1. Introduction

European Universities are a recent commitment of the *European Commission* within the *Erasmus Plus* programme to coordinate a new higher education area. According to the *European Strategy for Universities* (*European Commission*, 2019), the aim is to create a strong university network that promotes citizen participation, social cohesion and a sense of belonging to the Union. In a context of ongoing crises and the rise of cultural Euroscepticism (**Treib**, 2021), which questions supranational integration processes on identity-based grounds, the document positions the university system as a vital agent for the interests of the EU.

Specifically, the initiative aims to support a total of 60 European Universities comprising more than 500 institutions by mid-2024. European Universities operate as consortia of higher education institutions spread across the countries that are part of the *Erasmus* area, and are therefore mainly funded by *Erasmus*, but also by *Horizon Europe* or the *Recovery and Resilience Mechanism*. They also respond to a request from European leaders at the *Gothenburg Summit* in Sweden in November 2017, which called for initiatives to strengthen strategic alliances in higher education.

The development of alliances is evidence of the proactive and pro-European policy implemented by EU institutions, with strong implications in the field of communication. This is visible in the massive use of social networks at an institutional level (**Vesnic-Alujevic**, 2016), as well as in the fact that the officials of these bodies recognise that they prioritise segmented communication campaigns aimed at young people (**Rivas-de-Roca**; **García-Gordillo**, 2022a), who constitute the population group most present in universities. After Brexit, the EU seems to want to move beyond the so-called "permissive consensus", which consisted of a tacit acceptance of the European project (**Bee**; **Bozzini**, 2010), replacing it with a more robust support based on the generations that will play responsible roles in the future.

Following the resolution of the three calls (2019, 2020 and 2022), there are 44 European Universities comprising approximately 240 higher education institutions, both from capital cities and remote regions in 31 countries, including all EU Member States plus Iceland, Norway, Serbia and Turkey. These university consortia collaborate with over 1,300 partners ranging from NGOs to businesses to local and regional authorities. The potential synergies generated link with the four formal goals set by the European University Strategy:

1) to strengthen the dimension of the higher education system and its research;

2) to support universities as beacons of the European way of life;

3) to empower universities as players in the green challenge and the digital transition; and

4) to reinforce these institutions as drivers of the EU's global and leadership role.

On the European continent, universities have undergone a profound transformation in the last 20 years, characterised by greater internationalisation and reputational competitiveness due to the proliferation of rankings (**De-Aguilera-Moyano**; **Farias-Batlle**; **Baraybar-Fernández**, 2010; **Bustos-González**, 2019). Similarly, the growing concern for transparency in public spending has led universities to improve their communication policies in order to fulfil their third mission (**Montesinos** *et al.*, 2008), that is, their commitment to society. This need makes it necessary to professionalise communication tasks, similar to what is happening at EU institutions.

University policy, but also the use of social networks by countries (**Newman** *et al.*, 2022) or the degree of involvement in a potential European public discussion (**Hänska**; **Bauchowitz**, 2019), are determined by national and even local factors. Faced with this, initiatives such as the European Universities can spur a new type of integration, beyond the mere exchange of the *Erasmus* programme. In this context, this research seeks to explore these university spaces as autonomous institutions beyond their constituent entities, analysing their communication and capacity to influence public opinion. This is a pioneering approach to the communicative dimension of a recent transnational phenomenon, contributing to the state of the art. The aim is to shed light on the value of institutional communication in these publicly funded consortia.

> "Universities have undergone a profound transformation in the last 20 years, characterised by greater internationalisation and reputational competitiveness"

2. Background

2.1. The mediatisation of the *European Public Sphere* (*EPS*)

At European level, the EU institutions have had a direct impact on the lives of European Union (EU) citizens for decades, which has led to a large number of discussions on the existence of a possible shared space for deliberation (**Baisnée**, 2007; **Rivas-de-Roca**; **García-Gordillo**, 2022b), known as the *European Public Sphere* (*EPS*). Despite this, the literature coincides in highlighting the persistence of a communicative and democratic deficit surrounding the EU, which is perceived as a distant and bureaucratic entity (**Koopmans**; **Statham**, 2010; **Frangonikolopoulos**; **Papapadopoulou**, 2021).

Traditionally, academia has focused on the role that the media might play in the *EPS* (**Gripsrud**; **Weibull**, 2010; **Grill**; **Boomgaarden**, 2017), illustrating the persistence of a predominantly national approach that continues to this day (**Berry** *et al.*, 2021). However, the consolidation of digital platforms as political spaces (**Casero-Ripollés**, 2018), together with the personalisation and mediatisation of democratic processes (**Amado**, 2016), lead to a certain optimism that digital technologies will make it possible to achieve the *EPS*.

Authors such as **Scharkow** and **Vogelgesang** (2010) pointed out that information was not only key to promoting better knowledge of the EU, but that education should also play an important role. These academics referred to the *European Higher Education Area* (*EHEA*), which they argued would have a greater impact on countries with a longer history as member states. This approach did not prevent the *European Parliament* elections from remaining in the collective imagination as second-rank elections (**Schneider**, 2018), which saw a slight increase in turnout in 2019.

In a digitalised context, social networks have been the subject of profound debates and Europeanised phenomena, especially in the wake of the Eurozone crisis (**Hänska**; **Bauchowitz**, 2019; **Císař**; **Weisskircher**, 2021). These discussions have moved beyond the institutional arena, bringing the question of Europe into everyday affairs. However, the increased volume of mentions of the EU, both in the media and among the audience, does not necessarily imply a Europeanisation of public debates (**Silva**; **Kartalis**; **Costa-Lobo**, 2022). In fact, the literature still sometimes speaks of national spheres that can be oriented in a European way in their media-discursive plot (**Von-Nordheim** *et al.*, 2021).

The findings are ambivalent, as other researchers point to the benefits of politicisation (**De-Wilde**; **Leupold**; **Schmidtke**, 2016), in the sense that political dissent and conflict are key to generating a sense of belonging to the EU. In any case, what is clear is that social media and digital platforms have reshaped the field of action of *European Communication*, which is occurring alongside increasing politicisation (**Van-der-Brug**; **Gattermann**; **De-Vreese**, 2022). This explains why EU institutions are working towards a Europeanisation of civil society, with a special focus on young people.

Institutional action now appeals directly to citizens, bypassing the filter of the press, although it is still very relevant in the articulation of public opinion (**Nielsen**; **Ganter**, 2018). In this sense, social networks enjoy interaction mechanisms that are linked to the notion of deliberative democracy that the *EPS* entails (**Häussler**, 2018). Faced with the secular absence of information on the EU in the national media (**Goldberg**; **Brosius**; **De-Vreese**, 2022), the EU is committed to Europeanising citizens, given that all inhabitants of the member states are potential members of this ideal space for debate.

2.2. Transnational European communication

The different crises experienced by the European project have led the EU to implement a new type of public communication, based on reconfiguring the idea of Europe (**Papagianneas**, 2017). Therefore, EU institutions are optimistic about the possibilities that digital public discussion can have for the European project. Citizen use of digital platforms would thus encourage the creation of the *EPS*, given that tools such as *Twitter* are an effective way of solving the problem of geographical distance from the EU (**Tuñón Navarro**; **Carral**, 2019). This conviction motivates the communication policy to occupy a privileged position in the EU organisational chart, with a special interest in social networks (**Olsson**; **Hammargård**, 2016).

In today's pan-European communication, both traditional and digital media play a prominent role in the development of true accountability in European governance (**Caiani**; **Guerra**, 2017). The digital transformation has led to the emergence of new European transnational players, which have a certain capacity to set the media agenda (**Bouza**; **Tuñón**, 2018). This contrasts with the usual absence of a common communication strategy by European institutions (**Tuñón**; **Bouza**; **Carral**, 2019). Authors like **Fazekas** *et al.* (2021) report that most political players in Europe do not refer to EU issues to connect with their audiences, reflecting how the EU continues to play a secondary role in European politics.

In addition to the above issues, there are structural problems such as the lack of interest in the EU or the tendency for political activity on social media to be negative (**Kim** *et al.*, 2021). All of these operate as conditioning factors that determine inclusivity and a true discursivity around the Union. Despite this, pan-European communication in the digital era also benefits from new low-cost instruments that make it possible to overcome the well-known communication deficit (**Fazekas** *et al.*, 2021). Moreover, institutions seem to be increasingly focusing on citizens (**Oleart**, 2023), which is a contrast to their previous actions. It is therefore of particular interest to address the analysis of institutional communication in this digital environment.

> The *European Higher Education Area* (*EHEA*) has a greater impact on countries with a longer history as member states

2.3. Social networks as an institutional communicative element shaping public opinion

The aforementioned digitisation is one of the most significant challenges facing corporate and institutional communication as a whole (**Almansa-Martínez**; **Fernández-Souto**, 2020; **Zerfass** *et al.*, 2021). According to the European Communication Monitor, digitisation is the main reason for the rapid transformation of communication departments, consultancies and agencies.

Specifically, the phenomenon of social media has profoundly changed the way institutions communicate with their audiences (**Roth-Cohen**; **Avidar**, 2022). There is consensus on the interactive potential of these communication channels (**Allagui**; **Breslow**, 2016), which also contribute to strengthening engagement with audiences (**Moreno**; **Fuentes-Lara**; **Khalil**, 2018). At the same time, these technologies have allowed organisations, such as European institutions or universities, to communicate directly with their audiences without intermediaries (**Sallot** *et al.*, 2003; **Wright**; **Hinson**, 2017), although this communicative independence coexists with an empowerment of audiences (**Navarro-Beltrá**; **García-Medina**; **Miquel-Segarra**, 2020).

However, other research has shown that institutions are not taking advantage of the interactive possibilities of social networks (**Kent**, 2013) and that their use is more tactical than strategic (**Moreno** *et al.*, 2015). This coincides with professional reports that detect that professionals not only do not feel prepared, but also consider that their organisations are not committed to the paradigm shift (**Zerfass** *et al.*, 2021).

In this sense, social networks have become one of the main communication tools for universities to connect with internal and external audiences (**Pringle**; **Fritz**, 2019). In 2014, over 97% of Spanish universities had a *Twitter* account (**Gómez-Calderón**; **Paniagua-Rojano**, 2014). In fact, during the Covid-19 health crisis, universities mainly used *Twitter* to communicate with their audiences (**Ferrer-Serrano**; **Latorre-Martínez**; **Lozano-Blasco**, 2020). In this regard, it is important to select the right social networks based on their own interests and align them with their communication strategy to connect with their audiences (**Peruta**; **Shields**, 2017), with a growing use of *Instagram* being noticeable (**Alcolea-Parra**; **Rodríguez-Barba**; **Núñez-Fernández**, 2020).

Social networks are effective tools for achieving this connection and emotional engagement (**Clark**; **Algoe**; **Green**, 2018). For example, following social networks is generally related to a greater perception of the quality of the university by students, and, therefore, greater connection (**Mostafa**, 2015). Consequently, the correct planning of the institutional strategy of universities is essential to connect with different audiences, which is directly related to the importance that university governing bodies give to digital communication (**García-García**, 2018).

Together with the strategic planning of communication, the quality of the content published is key to achieving better interaction and, therefore, more followers on social networks (**Lund**, 2019). According to a recent study conducted in various geographical contexts, university publications on social networks are aimed at improving their institutional positioning and reputation (**Capriotti**; **Losada-Díaz**; **Martínez-Gras**, 2023), an instrumental sense also observed in more qualitative research with the communication managers of these institutions (**Simancas-González**; **García-López**, 2022).

In a changing context, European Universities are a new communicative phenomenon, with a plural and diverse audience, given that these consortia are made up of universities from different countries. Therefore, it is relevant to explore whether they are as institutionally active on social networks as their national counterparts. In view of the lack of studies on the subject that would allow us to draw hypotheses based on the literature, the following research questions are proposed:

RQ1. On which social networks are European Universities present?

RQ2. What is the volume of followers, as well as the information available on the profiles of these universities?

RQ3. How professional are their profiles on the preferred platform, in terms of original posts and regular updates?

3. Methodology

The main objective of this research is to make a first approximation to the social media presence of the 40 European Universities belonging to the first and second calls (see Appendix 1 with the full data), understood as consortia of conventional universities. This is the entire sample universe of these initiatives, excluding the four new universities approved in the resolution of the third call (27 July 2022), given that they have only just started and do not have a significant presence on the Internet. Moreover, and due to the exploratory nature of this research, two different stages have been established to achieve the secondary objectives.

In the first stage, the presence of the 40 European Universities on the different social networks has been analysed with the aim (RQ1) of drawing up a map of these alliances. This is a descriptive analysis taking into account the number of social networks used, the volume of followers, the coordinating university and the year of the call. From this first analysis, *Twitter* has been identified as the social network most used by the majority of European consortia. Of the 40 European universities, 37 have a presence on *Twitter*.

The second stage of the research focused on analysing the use of *Twitter* by the 37 university alliances, downloading all their messages through *Twitonomy* up to 9 October 2022. On the one hand, (RQ2) to analyse their presence on *Twitter*

based on the information of their profiles, the number of followers, the year the account was created. On the other hand, (RQ3) to find out whether European Universities use their *Twitter* accounts professionally, which has to do with the number of original messages, but also with the frequency. Both elements denote that social media activity is provided in a professional manner.

> European Universities are a new communicative phenomenon, with a plural and diverse audience, given that these consortia are made up of universities from different countries

To answer the research questions, a quantitative methodology was used, applying the technique of content analysis to all tweets published by the 37 European consortia from the time of their creation up to 9 October 2022. Each of these universities start their activity on different dates, although they belong to the same call for European funds, which has led us to collect all messages in order to determine the sample universe of tweets. The collection and coding of the data was carried out between 18 September and 23 November 2022, using a content analysis form designed ad hoc based on **Medina-Aguerrebere**, **Medina** and **González-Pacanowski** (2022).

Although the actual content of all the tweets was not analysed, 12 items that overlap with the nature of the messages were examined, grouped into three categories.

- The first part comprises a technical sheet composed of (1) the year the account was created and (2) the number of followers.
- Secondly, the presence of the different European consortia has been analysed based on the information contained in their *Twitter* profiles, namely (3) presence of the corporate logo, (4) use of hashtags, (5) link to the corporate pages, (6) full description of the consortium (for this point it has been taken into account whether the mission of the alliance is described), mention of the partners and the location, and finally (7) link to *Erasmus Plus*.
- The third part of the sheet corresponds to the tweets published during the period analysed. In this section, we have analysed (8) the total number of tweets from each of the European universities, (9) the number of tweets per day, (10) the percentage of original tweets, (11) the percentage of replies and (12) the percentage of retweets. The type of tweet provides insight into the degree of involvement in the production of original content and its response capacity. All these data are compared across alliances to provide an overview of their use of social networks.

Finally, as an exploratory qualitative analysis, the open artificial intelligence tool *Abbrevia.me*, which uses *ChatGPT* technology, has been used to analyse the image projected by a *Twitter* account to its users based on its content. This analysis has been conducted with the ten European University accounts with the highest number of followers. This approach to content was completed using the *Nvivo Release 1.7.1* program to generate word clouds with the most used terms in their publications (including mentions and hashtags) on each of the accounts, in order to determine the main topics and degree of interaction of the consortia.

4. Results

4.1. Presence of European Universities on social networks

Social media seems to be a common communication tool for European Universities. All the consortia that emerged from the *Commission*'s first and second calls have social networks to address their communities, although the map they draw is uneven in different aspects (Table 1). The predominant social networks are *Twitter*, *Facebook*, *Instagram*, *LinkedIn* and *YouTube*. Only one (*Arqus Alliance*) has *Spotify* and in almost all cases the social media profiles are linked on the homepage of their websites, with the exception of *AllianceYufe*.

From this first approximation, it can be deduced that the new European universities have considered social networks to be an essential space for publicising their activities and establishing a dialogue with their communities, at least in a formal way. Of these, *Twitter* stands out as the most used network, followed by *Instagram*, *Facebook* and *LinkedIn* (which coincide in the number of accounts) and, finally, *YouTube*.

Table 1. Distribution of social media use by consortia generation

Social network	First generation	Second generation	Total
	15 (all)	21 (except 3)	37/40
	10 (except 5)	18 (except 6)	28
	11 (except 4)	17 (except 7)	28
	10 (except 5)	21 (except 3)	31
	7 (except 8)	16 (except 8)	23

The above platforms are the most popular among the general population, but it is worth noting that *Twitter* is a social network that stands out in terms of information. Furthermore, the data suggest that the frequency of social network use seems to vary between countries, with *Instagram* and *TikTok* being the most common among university-age young people (**Newman** *et al.*, 2022). However, during the period under study, none of the European universities had *TikTok*.

If we analyse the number of networks that each consortium has according to the call to which they belong, we find the following data (Table 2).

According to the information available, the second-generation consortia were committed from the outset to having a presence on social networks. The behaviour of the first-generation entities was more cautious, perhaps because in 2019 the European Universities initiative was at an early stage and there was still uncertainty as to how these new entities would materialise. In any case, most of them had profiles on three or more social networks, suggesting that they saw these platforms as a window of communication to their communities.

Table 2. Number of social networks used by first- and second-generation consortia

No. of social networks	First generation (2019)	Second generation (2020)	Total
5	3	15	18
4	6	3	9
3	3	5	8
2	2	0	2
1	1	1	2

Following the ranking of the most used social networks, available in Table 1, presented below are the leading European Universities by number of followers on each of the platforms, following the localised order and incorporating descriptive information on their type of use. The coordinating university is of great interest, as its state affiliation may explain the social media activity of the alliances. In the case of *Twitter* (Table 3), the fact that it is the network with the largest number of consortia means that a content analysis is subsequently directed towards it, complementing the data presented here.

Table 3. Main European Universities on *Twitter*

Acronym	Generation	Coordinating university	Country	N. of networks	*Twitter*	N. of followers
UNA.Universitas	1	*X*	X	4	@Una_Europa	3,322
Civica	1	*Institut d'Études Politiques de Paris*	France	2	@CIVICA_EU	2,713
Civis	1	*X*	X	4	@civis_eu	2,246
ECIU	1	*University of Twente*	Netherlands	3	@ECIUniversities	1,983
AllianceYufe	1	*Maastricht University*	Netherlands	1	@AllianceYufe	1,856
Eutopia More	1	*Universitat Pompeu Fabra*	Spain	5	@EutopiaUni	1,792
Circle U.	2	*University of Oslo*	Norway	3	@CircleU_eu	1,773
1Core	1	*Sorbonne University*	France	4	@4EUPlusAlliance	1,525
Charm-Eight	1	*Universitat Barcelona*	Spain	4	@charm_eu	1,514
Arqus	1	*Universidad de Granada*	Spain	5	@ArqusAlliance	1,248

Firstly, it is striking that two of the leading European universities on *Twitter* (*Una.Universitas* and *Civis*) do not state on their websites which institution is the coordinating institution, which denotes a certain lack of transparency, given that EU calls require this figure. Of the eight consortia with available information, three have Spanish coordinating universities, two French, two from the Netherlands and one from Norway. This shows some repetition in the countries that manage these profiles with the greatest impact.

Beyond the differences in the number of followers, which will be referred to in the following section, the data reveal that only two of the 10 alliances highlighted on *Twitter* have accounts on the five networks analysed. Four are present on four of these platforms, two on three, one on two and only one is exclusively dedicated to *Twitter*, from which it can be deduced that this network is not usually used solely, but rather accompanied by a presence on other channels. In this sense, the second most important space for the audience is *Facebook*.

Table 4. Main European Universities on *Facebook*

Acronym	Generation	Coordinator	Country	No. of networks	*Facebook*	Likes
Arqus	1	*Universidad de Granada*	Spain	5	Arqus Alliance	6,728
Civis	1	*X*	X	4	@Civis EuropeanUniversity	2,877
1Core	1	*Sorbonne University*	France	4	4EU+Alliance	1,400
ECIU	1	*University of Twente*	Netherlands	3	@eciuorg	1,360
EU-Conexus Plus	1	*Rochelle Université*	France	5	@eu.conexus	1,293
Eugloh 2.0	1	*Université Paris-Saclay*	France	4	Eugloh - European University Alliance for Global Health	1,228
Eutopia More	1	*Universitat Pompeu Fabra*	Spain	5	@eutopiaalliance	801
SEA-EU 2.0	1	Universidad de Cádiz	Spain	2	European University of the Seas SEA-EU	783
Eureca-PRO	2	*X*	X	5	Eureca-Pro	719
RUN-EU	2	*Politécnico de Leiria*	Portugal	5	RUN - European University	693

In the case of *Facebook* (Table 4), there is a repeated lead for consortia created in the first call and which account for the majority of the list, in a finding that was also observed for *Twitter*. Specifically, only two European Universities from the second call rank in the top ten for *Facebook*, and they do so in the last two positions. The year of difference between alliances thus seems to determine the impact in terms of number of followers.

Another relevant fact is that half of the top ten European Universities have accounts on the five main social networks, while three have accounts on four platforms, one on three and one on two of them. Therefore, the use of *Facebook* is more often complemented by other social networks, with *Facebook* occupying a central position. For their part, the countries of origin of the coordinating universities are very similar to *Twitter*. Table 4 shows how Spain stands out with three, France with two, and the Netherlands and Portugal with one respectively. This predominance of Spain and France is even greater on *LinkedIn.*

Table 5. Main European Universities on *LinkedIn*

Acronym	Generation	Coordinator	Country	N. of networks	*LinkedIn*	N. of followers
Una.Universitas	1	*X*	X	4	Una Europa	3,032
Ulysseus	2	*Universidad de Sevilla*	Spain	5	Ulysseus European University	1,922
ECIU	1	*University of Twente*	Netherlands	3	ECIU	1,883
Eutopia More	1	*Universitat Pompeu Fabra*	Spain	5	Eutopia European University	1,768
Eelisa	2	*Universidad Politécnica de Madrid*	Spain	3	Eelisa European University	1,544
1Core	1	*Sorbonne University*	France	4	4EU+Alliance	1,470
EU-Conexus Plus	1	*Rochelle Université*	France	5	EU-Conexus	1,402
Arqus	1	*Universidad de Granada*	Spain	5	Arqus	1,314
Epicur-Shape-IT	1	*University of Strasbourg*	France	2	Epicur University Alliance	1,241
EUniWell	2	*X*	X	5	EUniWell - European University for Well-Being	1,190

According to the data available on *LinkedIn* (Table 5), first-generation universities still have a seven-to-three lead. However, the fact that some second-generation universities (*Ulysseus* and *Eelisa*) occupy leading positions in terms of volume of contacts is new. The cost of learning to position oneself on these networks is lower, at least for two alliances led by Spanish institutions.

It should be noted that five of the 10 have accounts on all the social networks analysed, again reflecting their complementary use. Moreover, as mentioned above, Spain (four), France (three) and the Netherlands (one) stand out by country, the latter through *ECIU*, which had a notable presence on *Twitter*, *Facebook* and *LinkedIn*.

Table 6. Main European Universities on *Instagram*

Acronym	Generation	Coordinator	Country	No. of networks	*Instagram*	No. of followers
Civis	1	*X*	X	4	Civis - A European Civic University	2,952
1Core	1	*Sorbonne University*	France	4	4EUplus_alliance	1,844
Forthem	1	*Johannes Gutenberg University Mainz*	Germany	4	Forthem Alliance	1,830
Una.Universitas	1	*X*	X	4	Una Europa	1,703
Arqus	1	*Universidad de Granada*	Spain	5	arqusalliance	1,281
Eutopia More	1	*Universitat Pompeu Fabra*	Spain	5	Eutopia - European University	1,151
EU-Conexus Plus	1	*Rochelle Université*	France	5	EU Conexus	1,065
Eugloh 2.0	1	*Université Paris-Saclay*	France	4	Eugloh	1,033
Unita	2	*Università di Torino*	Italy	5	Universitasmontium	1,028
Charm-Eight	1	*Universitat de Barcelona*	Spain	4	Charm.eu	900

As opposed to the lesser difficulty of consolidation on *LinkedIn* of the second call universities, the figures for *Instagram* (Table 6) show a great predominance of the oldest entities on this social network. In fact, only one European University is among the top 10 in 2020. Despite the dynamism that characterises this platform, the number of followers is very much determined by the trajectory of the account, that is, by the time elapsed since its creation.

On the other hand, five consortia have accounts on the five social networks and four have accounts on six of them, which may be related to the fact that it is considered a complementary network to the other networks for improving interaction with young people, but not a platform for informing the entire community. The usual reference countries (Spain and France, with three consortia) are joined by Germany and Portugal, with one respectively.

Table 7. Main European Universities on *YouTube*

Acronym	Generation	Coordinator	Country	N. of networks	*YouTube*	N. of followers
Arqus	1	*Universidad de Granada*	Spain	5	Arqus Alliance	593
Eureca-PRO	2	*X*	X	5	Eureca-PRO	307
Eutopia More	1	*Universitat Pompeu Fabra*	Spain	5	Eutopia European University	267
RUN-EU	2	*Politécnico de Leiria*	Portugal	5	RUN – European University	267
Una.Universitas	1	*X*	X	4	Una Europa	209
NeurotechEU	2	*Radboud University Nijmegen*	Netherlands	5	NeurotechEU	172
EU-Conexus Plus	1	*Rochelle Université*	France	5	EU-Conexus European University	142
Ulysseus	2	*Universidad de Sevilla*	Spain	5	Ulysseus European University	141
Filmeu	2	*Universidade Lusófona*	Portugal	5	Filmeu - European University - Film and Media Arts	131
Civica	1	*Institut d'Études Politiques de Paris*	France	2	Civica, The European University of Social Sciences	126

Finally, with regard to *YouTube* (Table 7), the fact that the universities in the first and second calls for applications share the top ten positions equally is striking. In terms of the number of networks, eight of the ten have accounts on all of them, one has four and only one has two. This would confirm that, like *Instagram*, it is considered a complementary network to the rest of them, even more than it. In terms of countries, Spain stands out with three European University consortia, Portugal with two and France and the Netherlands with one.

The results show that there are several first-generation European Universities that once again occupy a privileged position on most social networks. Spain and France, two highly populated Member States with a long history of relevance to the EU, emerge as the home territories of the institutions with the highest impact on social networks. By platforms, *LinkedIn* and *YouTube* operate as spaces with a more permeable entry barrier, allowing the audience to be reached in less time, which may be of interest to universities joining in future calls.

4.2. *Twitter* as the preferred platform for dissemination

The value placed on *Twitter* by the vast majority of European Universities leads to a focus on this social network, in a context where EU institutions promote this type of direct digital communication. In fact, the funding granted for this initiative has a mandatory work package dedicated to communication. This sub-section is therefore structured as follows. Firstly, a description of the main elements used by the accounts is provided, as well as their impact on the number of followers. Next, an assessment is made of whether a professionalised action is performed on the basis of a content analysis, which compiles the data to provide calculations on the volume of daily tweets, percentages of own tweets, retweets and replies.

All European Universities have a corporate logo as their *Twitter* profile image, to which a link to the corporate pages of each consortium is added. The only exception is *EU-Conexus*, which does not have such a link. In contrast, there are several universities that do not provide a corporate description in their profile, in the sense of informing about the centres that make up the project and the mission of the project. Ten European universities, that is, a quarter of the sample, do not provide this information: *4EUPlusAlliance*, *Arqus Alliance*, *Civis*, *EDUC*, *Eutopia*, *Engage*, *EUniWell*, *EurecaPro*, *FilmEU* and *NeurotechEU*.

For their part, the use of *Twitter*'s hypertextuality tools is limited, to the extent that only three of them connect to the accounts of the consortium members. This makes direct access to these universities impossible. Furthermore, only *Enhance*, *EUniWell*, *FilmEU* and *Universeh* have hashtags in their descriptions, while the link to other social networks can only be found in *Eudres*, which uses the *Linktree* tool to present its profiles on different platforms.

It is also striking that two European Universities (*Civica* and *ECIU*) refer to *Erasmus Plus* in their profile, which is the programme that funds this initiative, and another one (*Charm Eight*) refers to the *European Commission*, which is the institution behind the proposal.

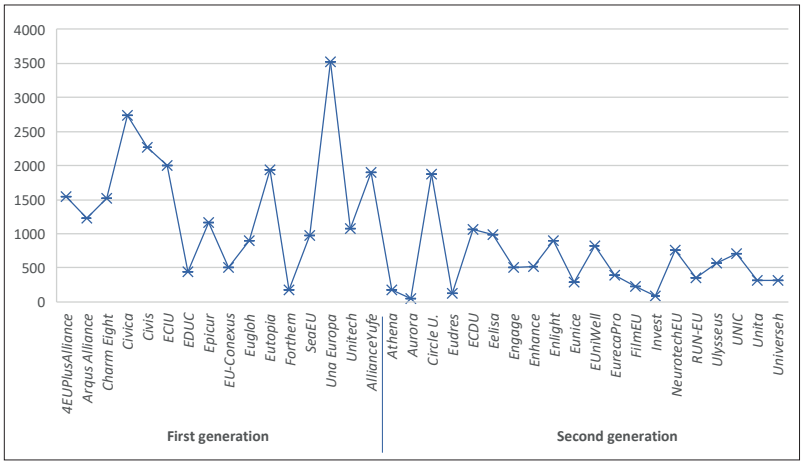


Figure 1. Number of followers of each consortia, distributed across generations.

With regard to the location of the account in their *Twitter* descriptions, 20 of the 37 do not indicate any location, 12 are generically located in Europe, two indicate countries but no city, and three are located in specific countries (Belgium, France and Germany), where their coordinating universities are from.

The number of followers again shows huge differences between first- and second-generation European Universities (Figure 1). Most of the latter do not reach 1,000 followers, the main exception being *Circle U.*, coordinated for the Norwegian *University of Oslo*. In contrast, there are several first-generation alliances with well over 1,000 followers. *Una.Europa*, *Charm Eight* and *Civica* are the highest volume cases in this area, with over 2,000 followers.

With regard to the production of messages, there is a very disparate volume between the different alliances, although a lower number of tweets published per day can be seen in the second-generation alliances (Table 8). Likewise, most of the universities that produce the most tweets correspond to those with a higher volume of followers. This is the case for *Civica* (1.66 tweets per day), *Civis* (1.2), *Eutopia* (1.09) and *Una.Europa* (1.05). However, the high number of tweets issued by second-generation universities with a low number of followers, such as *Ulysseus* (1.76), *ECDU* (1.13) and *Enhance* (1.12), is worth noting.

A high volume of production can be linked to the existence of a dedicated communication team. In this respect, another factor to consider is the volume of own tweets or replies, which imply a higher degree of work than merely retweeting. To this end, Table 9 shows the type of messages that prevail in each of the European universities, together with their percentage. Most universities concentrate their efforts on their own tweets, but it is not negligible that 10 of them do not reach 60% of their own tweets and that another 11 of them prioritise retweets.

According to the data collected, the alliances that stand out for a higher production of original tweets are *Eugloh* (93.1%), *EurecaPro* (91%), *Arqus Alliance* (88.7%) and *Film EU* (73.4%). On the contrary, the content of the *ECDU* (76.7%), *EDUC* (68.5%) and *ECIU* (60.7%) consortia is based on retweeting content from other accounts. Meanwhile, the alliances with the highest proportion of responses are *Eudres* (45.2%) and *Ulysseus* (41.1%). It should be noted that the average response rate of all consortia is 9.8%, a fact that demonstrates the unidirectional nature of the accounts. In fact, the profiles of *Eugloh*, *FilmEU* and *Invest* do not have any response tweets.

Table 8. Distribution of *Twitter* variables according to alliances

	Creation date	Number of tweets	Average tweets per day
4EUPlusAlliance	Feb-19	928	0.69
Arqus Alliance	Jun-19	971	0.79
Charm Eight	May-19	1,003	0.80
Civica	Nov-19	1,789	1.66
Civis	Oct-19	1,326	1.20
ECIU	Mar-15*	2,139	0.77
EDUC	Feb-19	235	0.17
Epicur	Jun-19	668	0.54
EU-Conexus	Jan-20	339	0.33
Eugloh	Apr-20	793	0.86
Eutopia	Dec-18	1,531	1.09
Forthem	May-21	511	0.97
SeaEU	Mar-20	625	0.65
Una Europa	Jul-18	1,648	1.05
Unitech	Oct-19	1,275	0.87
AllianceYufe	Feb-19	595	0.44
Athena (second generation)	Apr-21	143	0.26
Aurora	Sep-16*	765	0.34
Circle U.	Jul-19	752	0.63
Eudres	Mar-22	73	0.33
ECDU	Feb-19	1,529	1.13
Eelisa	Oct-20	611	0.83
Engage	Jun-20	218	0.25
Enhance	Oct-20	826	1.12
Enlight	Apr-20	229	0.25
Eunice	Jan-21	258	0.40
EUniWell	Apr-20	588	0.64
EurecaPro	Jul-20	111	0.13
FilmEU	Jul-20	273	0.32
Invest	Jun-21	102	0.20
NeurotechEU	Jul-20	119	0.14
RUN-EU	Aug-20	181	0.22
Ulysseus	Dec-20	1,192	1.76
UNIC	Apr-20	427	0.46
Unita	Nov-20	193	0.27
Universeh	Oct-20	166	0.22

The figures in **bold** refer to those accounts posting more than one tweet per day on average.
* *Twitter* accounts created prior to the European Universities call.

Table 9. Distribution of the type of tweets by consortium (%)

	European Universities
Predominance of own tweets	*Eugloh* (93.1), *EurecaPro* (91.0), *Arqus Alliance* (88.8), *FilmEU* (85.3), *NeurotechEU* (74.8), *EU-Conexus* (73.4), *Eunice* (72.5), *SeaEU* (70.9), *Eelisa* (67.9), *Engage* (66.5), *Unita* (61.6), *EUniWell* (60.7), *Epicur* (60.1), *Athena* (59.4), *Civis* (59.2), *Una Europa* (59.2), *Enlight* (58.9), *Aurora* (52.8), *Forthem* (51.6), *Civica* (51.6), *Charm Eight* (51.0), *AllianceYufe* (44.0), *Enhance* (40.4)
Predominance of responses	*Eudres* (45.2), *Ulysseus* (41.1)
Predominance of retweets	*ECDU* (76.7), *EDUC* (68.5), *ECIU* (60.7), *Eutopia* (58.7), *Circle U.* (58.3), *UNIC* (58.1), *Unitech* (56.0), *Invest* (55.8), *RUN-EU* (53.0), *Universeh* (52.4), *4EUPlusAlliance* (50.0)

On the other hand, Figure 2 shows the proportion of own content, retweets and replies, and their relationship with the number of followers. In this sense, *Una Europa*, the consortium with the highest number of followers, has a majority of original and own content (59.9% compared to 33.6%), with a response rate of 7.1%. In contrast, the European University with the lowest number of followers, *Aurora*, has a very similar percentage between original tweets (52.8%) and retweets (45.2%), and a response rate of 1.9%. Moreover, *EDUC* is the second with the second highest number of retweets and also one of those with the lowest volume of followers and messages published per day.

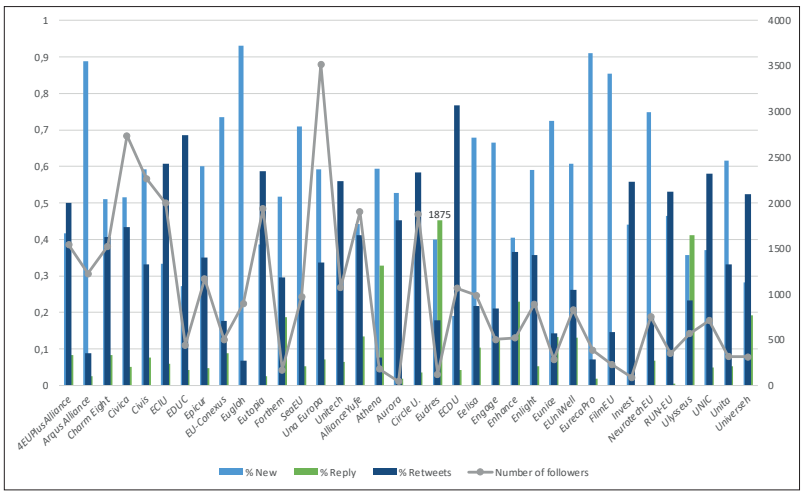


Figure 2. Distribution of own content, responses and retweets

It is important to be cautious when interpreting this data because there are consortia that combine a high percentage of original tweets and responses with a very low number of followers. This is the case with *Atenea* and *Eudres*. Similarly, *Circle U.* stands out for being the second-generation European University with the highest number of followers and the content of its account is mainly based on retweets (58.3%). On the contrary, *Ulysseus* has a high proportion of its own tweets and replies yet only has 570 followers.

The image projected by the ten most followed accounts of the European consortia, according to the platform *Abbrevia.me*, is described as follows.

Table 10. Description of the image projected by the 10 most followed accounts according to *Abbrevia.me*

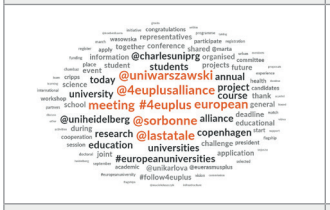
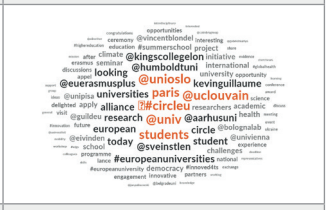
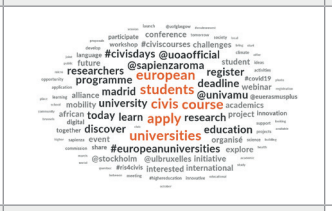
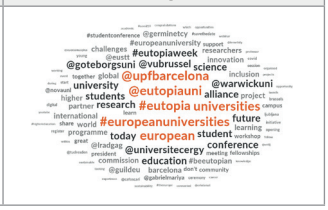
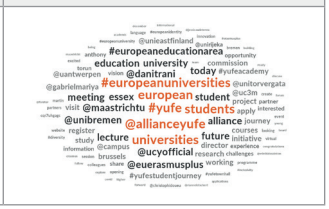
University	Description
Una Europa	Projects an image of an academic organisation committed to diversity, inclusion and excellence in higher education in Europe. Its tweets cover a wide range of topics, from calls for proposals and research opportunities to university-related news and events. It also focuses on topics such as project management, the quality of higher education and the regulation of joint degrees in Europe. Overall, its tweets reflect an active organisation committed to the continuous improvement of higher education in Europe.
Civica	It projects an image of an academic organisation committed to cooperation and dialogue between European universities. In general, it talks about issues related to research, higher education, diversity, inclusion and sustainability. It also shares information about events and opportunities for students and academics in the *Civica* alliance.
Civis	It projects an image of an educational organisation committed to promoting learning opportunities for students and academics across Europe. In general, it talks about issues related to higher education, research, gender equality and global challenges. It also promotes online and face-to-face programmes and courses for students and academics from *Civis* member universities.
ECIU	It projects an image of an organisation committed to European-level university collaboration and innovation in education, research and development. In general, it talks about projects and events related to university cooperation, research, innovation and education in Europe. It also shares news and retweets about events and projects of other organisations related to education and research in Europe.
AllianceYufe	It projects the image of being an official account of the European university alliance *YUFE*, sharing information and news related to the European university initiative and its activities. In general, it talks about issues related to higher education, research, international collaboration and diversity in the university community. It also shares information about events and opportunities for students and academics.
Eutopia	It projects the image of a university committed to research and international collaboration. In general, it talks about issues related to higher education, research, science, culture and diversity. It also shares information about events and opportunities for students and academics.
Circle U.	It projects the image of an organisation that focuses on higher education and research, with a focus on diversity, inclusion and female empowerment. Its tweets include information about events, initiatives and training opportunities on topics such as global health, climate change, democracy and interdisciplinary research. It also shares retweets from other universities and organisations that share its values and goals.
4EUPlusAlliance	It posts mainly about events, projects and opportunities related to higher education and cooperation between European universities. It also shares information about online courses and master's programmes on topics such as the environment, entrepreneurship and sustainable development. Overall, the account projects an image of commitment to education and international collaboration.
Charm Eight	It projects the image of an academic organisation committed to sustainability and gender equality. In general, it talks about issues related to responsible research and innovation, collaboration between European universities, inclusive education and citizen engagement. It also shares information about events and learning opportunities in these areas.
Arqus Alliance	It projects an image of an academic and multidisciplinary organisation that promotes collaboration between European universities. In general, it talks about joint master's programmes, research opportunities, events and activities related to higher education and European culture. It also focuses on issues such as linguistic and cultural diversity, gender equality and the promotion of open science.

As can be seen from the descriptions of the artificial intelligence platform, the ten most followed European University profiles on *Twitter* are committed to the *EHEA*, and they do so in their publications, not only in terms of academic offerings, but also by reporting on interesting calls for proposals, scientific dissemination, events, culture, cooperation and gender issues.

> Social networks are a common communication channel for European Universities, highlighting the use of *Twitter* and *Instagram*

This aspect is also evidenced in the word clouds obtained through the program *Nvivo* using the content of their publications.

Table 11. Word cloud of the 10 most-followed accounts according to the program *Nvivo*

4EUPlusAlliance	***Arqus Alliance***	***Charm Eight***	***Circle U.***
			
Civica	***Civis***	***ECIU***	***Eutopia***
			
Una Europa	***AllianceYufe***		
			

From the analysis of the terms most used by the top ten European universities (Table 11), it can be seen that self-referentiality is the general trend among the consortia. In other words, these universities use *Twitter* to make themselves known, not only by including themselves in the content, but also by generating hashtags with their name for monitoring purposes. There are also numerous mentions of the accounts of the universities forming the consortium, as well as allusions to the fundamental elements already described in Table 10, such as allusions to their students, research, sustainability, the *EHEA* and the concept of university.

5. Discussion and conclusions

Based on the descriptive compilation of the presence of European Universities on social networks and the content analysis of their activity on *Twitter* as a preferred network, this paper has tried to deepen the institutional communication of a new subject of higher education, called to channel a large part of the mobility resources in Europe over the coming years. European Universities are born out of the need to increase the impact of institutional collaboration on citizens, for which communication is essential. For this reason, the presence of these alliances on social networks was firstly analysed (RQ1).

The data show that these platforms are a widely used medium for institutional communication and are almost always linked from the consortium's website. *Twitter* and *Instagram* are the most used platforms, making it possible to interpret that, on the one hand, priority is given to informative messages (*Twitter*) and, at the same time, use is made of a channel with a high penetration rate among the young population that forms the student body of these institutions (*Instagram*). The number of followers is extremely low for the communities they manage, and first-generation universities have a head start, with *LinkedIn*, *Instagram* and *YouTube* acting as complementary networks. Spain leads all rankings, followed by France, Portugal, the Netherlands and Italy. *Arqus Alliance*, led by the *University of Granada*, and *Eutopia*, led by *Universitat Pompeu Fabra*, are the only ones that stand out on the five platforms evaluated.

With regard to the activity developed on *Twitter* as the preferred social network of these European University consortia (RQ2), our research shows a scarce use of the interaction possibilities of this social network. Moreo-

> The use of the interaction possibilities of *Twitter* is scarce, and the strategic use of this platform is punctual

ver, the descriptions could be much improved in terms of explaining the concept of the European University, its objectives or its members. First-generation alliances again show a clear superiority, visible in the number of followers. This figure does not reach 1,000 in most of the second-generation consortia.

> The institutional communication made is conditioned by the country of origin and the year of the call

As a third contribution, with regard to content, some alliances demonstrate professionalised work (RQ3), but in general the first-generation initiatives produce more tweets and, specifically, those with more followers. The majority of the sample sends less than one tweet per day, with European universities of French and Spanish origin breaking this trend the most. Furthermore, a third of the sample gives more quantitative importance to retweets than to their own messages, implying that these institutional profiles serve as a sounding board for messages posted by others. The original use of *Twitter* appears to be ad hoc, being limited to a few European universities, which seem to be conditioned by elements such as national origin or seniority.

Moreover, with regard to the image projected by the content (RQ3), it can be considered, according to the exploratory analysis of the ten most followed accounts, that European Universities are committed to the *Higher Education Area* (*EHEA*) in their publications, to which they make reference in various aspects ranging from the educational offer to the dissemination of research results or events. It can also be considered that all of them make a communicative effort to promote themselves among their wide and dispersed communities by resorting to self-referencing through the tools enabled by *Twitter*: self-mentioning and hashtags. This would explain the excessive use of retweets by most of the European consortia analysed, which are forced to give visibility to the different events and activities of the universities comprising the consortium, but at the same time create an image of a common project.

The findings show that these universities are not so much "European", but rather that the background of their coordinating university influences their institutional communication. Data from the *Digital News Report* illustrate the differences in the use of social networks by country (**Newman** *et al.*, 2022). Spain stands out in the use of *Twitter* for both information and leisure purposes (32% of the population), followed by Italy and Sweden with 17%, and France and Portugal with 15%. However, reference is made to several countries where *Twitter* is residual, such as Austria, Belgium, Bulgaria, Croatia, Hungary, Poland, Romania and Slovakia. This may establish a relationship between the number of *Twitter* followers of European Universities and the cultures of use of this social network in the different countries leading each consortium.

Twitter remains the social network most used by university institutions, which is consistent with previous literature (**Ferrer-Serrano**; **Latorre-Martínez**; **Lozano-Blasco**, 2020). The low interactivity on this platform is also consistent with previous studies (**Kent**, 2013; **Moreno** *et al.*, 2015; **Zerfass** *et al.*, 2021). According to the analysis of the number of followers and the volume of tweets, strategic planning and quality of content are important for achieving a better relationship with followers (**García-García**, 2018; **Lund**, 2019). However, comparative data between first- and second-generation consortia show that long-term work is also defined as fundamental in gaining and maintaining a community.

With regard to the corporate culture of the coordinating university, which as discussed above may be connected to the country of origin, previous research on the *EPS* has suggested that the articulation of the *European Higher Education Area* (*EHEA*) would have a greater reach in those countries with a long history of EU membership. This would help to understand why France and Spain are the most prominent in the field of European Universities, accompanied by other EU-15 member states, while Eastern European countries occupy a peripheral position.

A limitation of our work is that it does not consider the interrelationships generated by the communication flow of European Universities, as it does not analyse who is retweeted or how the alliances relate to each other and to other stakeholders. This study serves as a first approach to a recent phenomenon of the construction of supranational higher education entities, called to orchestrate the future of this field in Europe.

In a context of the survival of national communication spheres (**Von-Nordheim** *et al.*, 2021), future research has the challenge of delving into the possible potential of this transnational communication, but also into the reservations that it may generate, for example, in terms of the extent to which local universities are involved in these initiatives. It would also be interesting to compare the results of the universities in such consortia with the European Universities themselves. These are still incipient projects, hence the need to investigate their impact in terms of awareness and involvement of members of the university community, especially young people, who are identified as a priority audience for the EU. The funding dedicated to this initiative needs to be traceable in terms of communication in order to ensure the involvement of its stakeholders.

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7. Annex. First and second generation European Universities

Acronym	Name of the European University	Gener.	Coordinator	Country	URL
4EUPlusAlliance	*4EU+European University Alliance*	1	*Sorbonne University*	France	*https://4euplus.eu/4EU-1.html*
Arqus Alliance	*Arqus European University*	1	*Universidad de Granada*	Spain	*https://www.arqus-alliance.eu*
Charm Eight	*Challenge-Driven, Accessible, Research-based and Mobile European University*	1	*Universitat de Barcelona*	Spain	*https://www.charm-eu.eu*
Civica	*The European University of Social Sciences*	1	*Institut d'Études Politiques de Paris*	France	*https://www.civica.eu*
Civis	*CIVIS- a European Civic University*	1	*X**	X	*https://civis.eu/es*
ECIU	*ECIU University*	1	*University of Twente*	Netherlands	*https://www.eciu.org*
EDUC	*European Digital UniverCity*	1	*University of Potsdam*	Germany	*https://educalliance.eu*
Epicur	*European Partnership for an Innovative Campus Unifying Regions*	1	*University of Strasbourg*	France	*https://epicur.education*
EU-Conexus	*European University for Smart Urban Coastal Sustainability*	1	*Rochelle Université*	France	*https://www.eu-conexus.eu/en*
Eugloh	*European University Alliance for Global Health*	1	*Université Paris-Saclay*	France	*https://www.eugloh.eu*
Eutopia	*European Universities Transforming to an Open Inclusive Academy*	1	*Universitat Pompeu Fabra*	Spain	*https://eutopia-university.eu*
Forthem	*Fostering Outreach within European Regions, Transnational Higher Education and Mobility*	1	*Johannes Gutenberg University Mainz*	Germany	*https://www.forthem-alliance.eu*
SeaEU	*The European University of the Seas Alliance*	1	*Universidad de Cádiz*	Spain	*https://sea-eu.org/seaeu2*
Una Europa	*Una Europa*	1	*X*	X	*https://www.una-europa.eu*
Unitech	*Unite! University Network for Innovation, Technology and Engineering*	1	*Technical University of Darmstadt*	Germany	*https://www.unite-university.eu*

Acronym	Name of the European University	Gener.	Coordinator	Country	URL
AllianceYufe	*Young Universities for the future of Europe Alliance*	1	*Maastricht University*	The Netherlands	*https://yufe.eu*
Athena	*Advanced Technology Higher Education Network Alliance*	2	*Politécnico do Porto*	Portugal	*https://athenauni.eu*
Aurora	*Aurora Alliance*	2	*University of Iceland*	Iceland	*https://alliance.aurora-network.global*
Circle U.	*Circle U. European University*	2	*University of Oslo*	Norway	*https://www.circle-u.eu*
Eudres	*Engaged and Entrepreneurial European University as Driver for European Smart and Sustainable Regions*	2	*ST. Pölten University*	Austria	*https://eudres.eu*
ECDU	*European Campus o City-Universities*	2	*University of Poitiers*	France	*https://ec2u.eu*
Eelisa	*European Engineering Learning Innovation and Science Alliance*	2	*Universidad Politécnica de Madrid*	Spain	*https://eelisa.eu*
Engage	*The European University engaged in societal change*	2	*University of Mannheim*	Germany	*https://www.engageuniversity.eu*
Enhance	*European Universities of Technology Alliance*	2	*Technische Universität Berlin*	Germany	*https://enhanceuniversity.eu/es*
Enlight	*European University Network to promote Equitable Quality of Live, Sustainability, and Global Engagement through Higher Education Transformation*	2	*University of Ghent & University of Bordeaux*	The Netherlands and France	*https://enlight-eu.org*
ERUA	*European Reforming University Alliance*	2	*Universität Konstanz*	Germany	*https://erua-eui.eu*
Eunice	*European University for Customised Education*	2	*Poznań University of Technology*	Poland	*https://eunice-university.eu*
EUniWell	*European University for Well-Being*	2	*X*	X	*https://www.euniwell.eu*
EurecaPro	*The European University Alliance on responsible Consumption and Production*	2	*X*	X	*https://www.eurecapro.eu*
EuroTeq	*EuroTeQ Engineering University*		*Technische Universität München*	Germany	*https://euroteq.eurotech-universities.eu*
FilmEU	*The European Universities Alliance for Film and Media Arts*	2	*Universidade Lusófona*	Portugal	*https://www.filmeu.eu*
Invest	*INnoVations of Regional Sustainability: European UniversiTy Alliance*	2	*X*	X	*https://www.invest-alliance.eu*
NeurotechEU	*European University of Brain and Technology*	2	*Radboud University Nijmegen*	The Netherlands	*https://theneurotech.eu*
RUN-EU	*Regional University Network European University*	2	*Politécnico de Leiria*	Portugal	*https://run-eu.eu*
T4E	*Transform4Europe: The European University for Knowledge Entrepreneurs*	2	*Universität des Saarlandes*	Germany	*http://www.transform4europe.eu*
Ulysseus	*European University for the citizens of the future*	2	*Universidad de Sevilla*	Spain	*https://ulysseus.eu*
UNIC	*The European University of Post-Industrial Cities*	2	*Erasmus University Rotterdam*	The Netherlands	*https://www.unic.eu/en*
Unita	*Universitas Montium*	2	*Università di Torino*	Italy	*https://univ-unita.eu/Sites/unita/en*
Universeh	*European Space University of Earth and Humanity*	2	*University of Toulouse*	France	*https://universeh.eu*
*EU4Art***	*Alliance for Common Fine Arts Curriculum*	1	*X*	X	*https://eu4art.eu/#*

*Universities marked with an X do not specify their coordinating institution.
**Officially recognized European University only between 2019 and 2022, as its EU funding has not been renewed.

Constructing "Normative power Europe": A critical analysis of the human rights narratives in Spanish media discourses on the European Union

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Abstract

The conceptualization of the EU as a normative power has become a central theoretical framework in the field of European studies. This concept highlights the EU's role in the promotion of normative principles, particularly those concerning its core values as laid out in article 2 of the *Lisbon Treaty*: human dignity, freedom, democracy, equality, the rule of law and respect for human rights. While the majority of academic works on *NPE* have mostly focused on the EU's external action, there is a growing trend to apply this concept to the study of member States that challenge the core values of the EU. This paper takes a step further in that endeavor through the analysis of Spanish media discourses on the EU, and their role in the discursive construction of the EU as a normative power, both internally and externally. Specifically, our research focuses on how the EU's commitment to human rights norms and the rule of law are reflected in dominant media discourses on the EU in Spanish media. To conduct our study, six national Spanish media outlets were selected based on the following criteria: Ownership; ideology; consumption; and impact. A final sample of 540 news items published between July 2021 and March 2022 were selected for analysis. Using a qualitative methodological approach that includes content analysis and critical discourse analysis, we analyzed the major discourses identified in relation to the EU, focusing on those in which the construction (or deconstruction) of the EU as a normative power is more prevalent. We also attempted to unfold how this construction is projected internally and externally.

Keywords

European Union; European Commission; Normative power; Human rights; Rule of law; EU's identity; EU's international role; Migrations; Hungary; Poland.

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1. Introduction

Joaquín Almunia (**Almunia**, 2011, p. 2), a Spanish politician and a former vice-president of the European Commission once said that

> "what distinguishes the EU from other international organizations is the fact that the Union's most appealing asset is not economical but rather lies in its principles and values."

This conceptualization of the European Union (EU) reflects the notion of Normative Power Europe (NPE), first coined by Ian Manners (**Manners**, 2002). NPE has become a central theoretical framework in the field of European studies, and it is often used as a main catalyst of academic debates on the international role of the EU (**Diez**, 2013; **Rodríguez-Prieto**, 2019). According to NPE, there are nine normative principles embedded in EU laws and policies that constitute its *acquis communautaire* and *acquis politique*. Those are: sustainable peace, freedom, democracy, human rights, rule of law, equality, social solidarity, sustainable development and good governance (**Manners**, 2002; 2008). Traditionally, academic works on NPE have focused on the EU's international role and how it diffuses its norms to other political actors outside the Union (**Manners**, 2002; 2011; **Rodríguez-Prieto**, 2019; **Jenichen**, 2022). Most recently, NPE is being invoked to study EU Member States (EUMS) that challenge the core values of the EU, as identified by NPE (**Pollack**, 2022; **Vida**, 2019; **Mos**, 2013).

Following **Diez**'s (2005, p. 626) observation that

> "the most interesting question about normative power therefore is not whether Europe is a normative power or not, but how it is constructed as one",

the aim of this study is to analyze if and how media discourses on the EU in Spanish media contribute to the discursive construction of the EU as a normative power. Specifically, our analysis focuses on if and how the EU's commitment to human rights norms and the rule of law are reflected in dominant media discourses on the EU in Spain. To conduct our study, six Spanish media outlets were selected based on the following criteria: Ownership (private *vs.* public); ideology (conservative *vs.* liberal); consumption (traditional outlets *vs.* online); and impact (audiences reached). A final sample of 540 news items published between July 2021 and March 2022 were selected for analysis. Using a qualitative methodological approach that includes content analysis and critical discourse analysis, we analyzed the major discourses identified in relation to the EU where human rights narratives are relevant. In our analysis, we studied how human rights narratives are used to portray or construct the EU as a normative power, and whether the marginalization or the discrediting of human rights narratives in debating certain issues can deconstruct the notion of NPE or contradict it. We also attempted to analyze how this construction is projected internally and externally. Our critical discourse analysis is based, inter alia, on a Foucauldian framework focusing on the forms and the limits of the sayable, conservation and appropriation (**Foucault**, 1991). We also attempted to identify communicative strategies that are used to promote narratives connected to the perception of the EU as a space of human rights values. The use of discourse analysis in international relations is becoming more common (**Diez**, 2001; **Holzscheiter**, 2014). Utilizing critical discourse analysis helps in unfolding the interplay between power and knowledge production, and it can explain how hegemonic discourses emerge, and how they are altered or challenged over time by the emergence of new discourses.

This article is composed of two basic parts. The first part reviews the emergence of the notion of NPE and the centrality of human rights and the rule of law in it. The second part analyzes to what extent major discourses on the EU in Spanish media conceptualize the EU as a space of human rights values and rule of law.

2. The EU as a Normative Power

The efforts to conceptualize and assess the identity and the nature of the EU and, above all, the role it plays in international relations have dominated the research agenda on the EU's foreign policy. One of the most widely used approaches –and to a large extent one of the most applauded ones– has been NPE, introduced in 2002 by **Manners** (2002).

Indeed, some innovative academic concepts emerged in the post-Cold War period, particularly after the approval of the *Maastricht Treaty*, which fostered the debate on the new role that the EU was expected to play in the global context

(**Whitman**, 1998). As Ian Manners himself recalls, authors such as **Duchêne** (1972) had already insisted that the EU, due to its particularities, had to be considered a "civilian power[1]" (**Maull**, 1990, p. 92). In contrast, others such as Hedley **Bull** (1982), insisted that military capabilities were relevant. He argued that in the absence of military capabilities, a *power* could not be considered as such, not even a *sui generis* or civilian power, as was argued in relation to the EU.

Overcoming these diatribes, **Manners** (2002) put forward a new concept: that of the EU as a "normative power". The concept of normative power overcomes the traditional approaches to understanding the EU not for what is does but rather for what is it,[2] that is a *changer of norms* (**Manners**, 2002) that

> "seeks to promote a different regulation in accordance with its own regulatory model" (**Rodríguez-Prieto**, 2019, p. 76).

Indeed, there have been five basic elements in normative terms that have constituted the EU internally: peace, freedom, the rule of law and human rights (**Manners**, 2002, p. 242). Additionally, one could speak of four additional norms within the constitution and practices of the EU. Those are social solidarity, anti-discrimination and the protection of minorities, sustainable development, and good governance. However, the latter are more contested (**Manners**, 2002). These are the same normative elements that the EU will also seek to project in its external action in such a way that they shape international relations and the different elements of the international system, thus contributing, in the words of former High Representative Javier Solana, "to the global common good" (**Hardwick**, 2011).

This projection takes place, in particular, through a series of strategies (**Manners**, 2002, p. 244):

- contagion or unintended diffusion;
- informational diffusion, the result of a conscious process of communication through declarations and other initiatives taken by the European institutions, the *Commission* above all;
- procedural diffusion, through the institutionalization of relations with third parties;
- transfer, based on the introduction of benefits and sanctions for compliance with the desired standards;
- open diffusion, resulting from the physical presence of the EU in the situations or contexts in question; and
- the cultural filter, relating to the learning and adaptation of standards by third parties.

These strategies are ultimately based on

> "persuasion, argumentation and the acquisition of prestige or embarrassment" (**Manners**, 2011, p. 235).

Manners (2008, p. 46) identified three principles that should govern the EU's promotion of its substantive values: 'living by example', 'being reasonable', and 'doing least harm'.

Manners (2011, p. 233) himself would highlight years later the importance of consistency and coherence in the promotion of these norms. In this sense, if the actions taken to promote certain values contradict them, the effectiveness of the projection will be reduced and the capacity of the actor, the EU in this case, to act as a normative power gets reduced accordingly as well. Similarly, if the EU fails to assert these principles domestically (**Cohen-Tanugi**, 2021, p. 91), or sovereignty or self-interest of states take priority over normative commitments (**Hardwick**, 2011), or some members call these values into question (**Cadier**, 2019, p. 37), the EU´s ability to project its norms beyond its borders could also be reduced.

It is important to note that the concept of normative power accounts for both civilian and military capabilities. Moreover, the notion of normative power is in line with that of "smart power," as a combination of hard and soft power in the right way and in the right proportion, as **Nye** (2009) would later argue. In order to be a normative power, it would be then necessary to have smart power, i.e., both, strong military and economic capabilities as well the ability to project influence and generate appeal. This being said, however, we must consider that not every actor with smart power is necessarily a normative power.

The events that followed the end of the Cold War proved the wisdom of this approach, with the display of significant progress by the end of the 1990s, not only in the field of civilian capabilities but also in that of military capabilities[3] (**Abad-Quintanal**, 2021), reflecting the EU's growing efforts to advance towards its strategic autonomy (**Palm**, 2021).

Consequently, the growing civil, ideational and military power of the EU has created a basis on which to consolidate over decades its role as a normative power. A power capable not only of acting internally on the basis of clearly established norms, but also capable of exporting these norms abroad –what has been called the 'Brussels effect' (**Cohen-Tanugi**, 2021, p. 91). Accordingly, these become the cornerstone of its external projection and its capacity to condition the behavior of non-EU member states (*SEAE*, 2016) and to define international relations according to its own preferences.

Diez and Pace argue that NPE

> "is a discursive construction rather than an objective fact" (**Diez**; **Pace**, 2007, p. 210);

the power of the concept, hence,

> "rests in the identity it provides for the EU and the changes it imposes on others, partly through its hegemonic status" (**Diez**; **Pace**, 2007, p. 210).

It is

> "first and foremost a discourse in which EU actors themselves construct themselves as 'model citizens'" (**Diez**; **Pace**, 2007, p. 211).

Diez argues that

> "the narrative of 'normative power Europe' constructs the EU's identity as well as the identity of the EU's others in ways which allow EU actors to disregard their own shortcomings unless a degree of self-reflexivity is inserted" (**Diez**, 2005, pp. 626-627).

The same author emphasizes that the articulation of identities is always infused with power. However, judging whether the construction of a particular identity is problematic or not depends on the context in which it is viewed. In the case of NPE, the content of the norms in itself is positive, since it envisions a more peaceful and a cosmopolitical world. Nevertheless, if these norms are projected without self-reflection,

> "the identity construction that they entail allows the continued violation of the norms within the EU" (**Diez**, 2005, p. 632).

Some scholars have claimed that the EU's decision to ignore or downplay human rights violations in certain countries and to focus the attention on violations in others suggests that the EU is not driven exclusively or primarily by its commitment to universal norms, instead, it can be driven by its own interests (**Zimmermann**, 2007; **Haukkala**, 2008; **Erickson**, 2011, **Pollack**, 2022). Others claim that the EU's material interests may underlie its normative policies. For example, **Kelemen** and **Vogel** (2009) argue that the EU environmental leadership is motivated not only by concern over the environment but out of economic interests.

Since the discursive construction of the EU as a normative power is a precondition for the EU and its institutions to be able to project themselves as normative actors, the aim of this study is to analyze whether media discourses on the EU in Spain contribute (or not) to the construction of the EU as a normative power.

The media landscape in Spain is characterized by a high level of political parallelism (**Teruel-Rodríguez**, 2016). Media parallelism refers to

> "a pattern or relationship where the structure of the political parties is somewhat reflected by the media organizations" (**De-Albuquerque**, 2018).

However, joining the European Community has never been a polarizing political project in Spain. A strong pro-European consensus always existed among political elites in Spain. When Spain joined the European Community, Europeanization was viewed as a path to democratization by the major political forces at the time (**Pérez-Escoda** *et al.*, 2023; **Ruiz**; **Egea**, 2011). The stance of the Spanish media on European integration is aligned with the strong pro-European tendencies of the major political parties in the country (**Sojka**; **Vázquez**, 2014). However, Spanish media outlets remain highly focused on national political systems compared to European affairs (**Sotelo**, 2009). **Candón** and **Márquez** (2014) note that there is a traditional deficit of coverage of the EU by the Spanish media. Additionally, a European perspective is not sufficiently taken into account in the analysis of the processes of European integration (**Díaz-Nosty**, 2005).

A study by **Menéndez** (2010) suggests that even pro-European media are likely to highlight negative stories in covering the EU, since negative or conflicting news attract readers. According to his study, there were more negative stories about the EU in pro-European Spanish media (and in France and the UK) compared to positive or neutral stories.

At a European level, media coverage of the EU depends highly on official sources, which leads the media to reproduce the messages of EU experts, especially in economic matters (**Arrese**; **Vara-Miguel**, 2016).

Having this context in mind, our study attempts to address the following questions:

- To what extent does the EU and its officials construct the EU as a normative power in discussing major issues covered by the Spanish media?
- Is the EU consistent in invoking human rights narratives in discussing major European issues?
- To what extent do the Spanish media adopt a human rights framing for covering major European affairs?

3. Methodology

The article is based on a mixed methodological design that aims to combine the strengths of both quantitative and qualitative research methods. The research is divided into two phases, based on the framing theory developed by **Borah** (2011).

In the first phase, the research team used content analysis to extract quantitative data from the selected news outlets (table 1). This technique systematically and objectively analyzes text-based communication content to identify patterns and trends throughout the exploration of large datasets.

In the second phase, critical discourse analysis (CDA) was applied to examine the news items from a qualitative perspective. CDA is a method of analysis that focuses on the language and discourse used in communication and how it can be used to construct and reinforce social norms and power dynamics. This approach allows for a more in-depth and interpretive analysis and can provide insights into the underlying meanings and ideologies present in the data.

Analyzing data can be challenging, especially when it involves multiple researchers who may have different interpretations of the data being studied. A rigorous methodology was put in place to ensure the coders' neutrality and coherency. This methodology involved a series of meetings and work sessions between September and December 2021. During these meetings, the research team agreed upon specific analysis criteria that would be used to interpret the data consistently. Nine coders formed the team. To ensure consistency and accuracy in the coding process, each researcher's work was reviewed and adjusted according to the operational definitions of each category. This step was essential to guarantee that each researcher understood correctly the categories and keywords used to interpret the data. The list of 20 keywords used to analyze the data included terms such as Europeanization, European Commission, polarization, Brexit, recovery funds, human rights, LGTBIQ, European migration, European frontiers, Ukraine, European affairs, European parliament, rule of law, European regulation, feminism, multiculturalism, refugees, minorities, sanctions, security, and cybersecurity. These keywords were chosen to cover a broad range of topics relevant to the study, ensuring comprehensive data analysis.

The news items studied in both phases were selected from six of Spain's leading national media outlets based on four criteria: ownership (public *vs.* private), format (traditional *vs.* digital), editorial line (conservative *vs.* liberal), and type of medium (television and newspapers). This selection process ensures that the study is representative of the diverse range of news outlets in Spain.

3.1. News item sampling

Sampling was a major strategic decision. Namely, defining which news items were to be analyzed and how they were to be accessed. The team used the *Twitter* accounts of all the selected media to perform the massive data download. At the global level, news organizations have consolidated their official social media accounts as an additional communication channel with their audience in addition to their offline strategy. Spanish media use their official *Twitter* channels to disseminate their agenda-setting to reach their audiences directly as an alternative channel (**Casero-Ripollés**; **Alonso-Muñoz**; **Marcos-García**, 2022). The scraping technique was the most suitable one for managing large amounts of data. All data from 12 *Twitter* accounts from the six selected news organizations were downloaded and stored from July 2021 to March 2022. The official accounts were:

- *El País* (@el_pais; @elpais_espana; @elpais_inter)
- *ABC* (@abc_mundo; @abc_es)
- *Elconfidencial.es* (@ECInter; @elconfidencial)
- *Eldiario.es* (@eldiarioes)
- *Antena 3* (@antena3int; @A3Noticias)
- *Televisión Española* (@rtvenoticias; @telediario_tve).

Table 1. News media selection by criteria (N=6)

Ownership	**Public**	**Private**
	RTVE	*Eldiario.es* *Elconfidencial.es* *Antena3* *El País* *ABC*
Format	**Legacy**	**Digital native**
	RTVE *Antena3* *ABC* *El País*	*Eldiario.es* *Elconfidencial.es*
Editorial line	**Conservative**	**Liberal**
	Antena3 *ABC* *Elconfidencial.es*	*RTVE* *El País* *Eldiario.es*
Platform	**TV**	**Newspapers**
	RTVE *Antena3*	*ABC* *El País* *Eldiario.es* *Elconfidencial.es*

The scraping technique was applied using the *NVivo* web browser software "NCapture," which allowed us to quickly and easily capture all the tweets published from these accounts during the selected timeframe. The researchers downloaded the captured data every 15 days and stored it in *Excel* sheets for retrieval. As a result, 162,944 tweets were extracted from the 12 accounts. Once the tweets were captured and stored, the research team filtered the messages to detect items related to the EU to obtain the final sample. The filtering process was carried out using keywords previously agreed upon by the researchers and considering the research objectives. Table 2 shows the filtered news items by medium and month of the sample period. A final sample of 543 news items was selected for analysis between July 2021 and March 2022 (n=543).

Table 2. News items per outlet and month (n=162,944)

Media outlets	**No. tweets**	**News items selection per month**									
		Jul	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Total**
ABC	27,708	7	6	5	11	15	8	7	14	9	82
Antena 3	18,325	5	1	5	9	9	8	6	7	11	61
Elconfidencial.es	21,804	9	0	9	12	23	4	7	18	12	94
Eldiario.es	24,902	8	7	11	17	28	14	10	18	17	130
El País	35,592	10	6	3	8	9	7	7	13	17	80
RTVE	34,613	8	7	7	13	11	12	10	17	11	96
Total	162,944	47	27	40	70	95	53	47	87	77	543

3.2. Content analysis (CA)

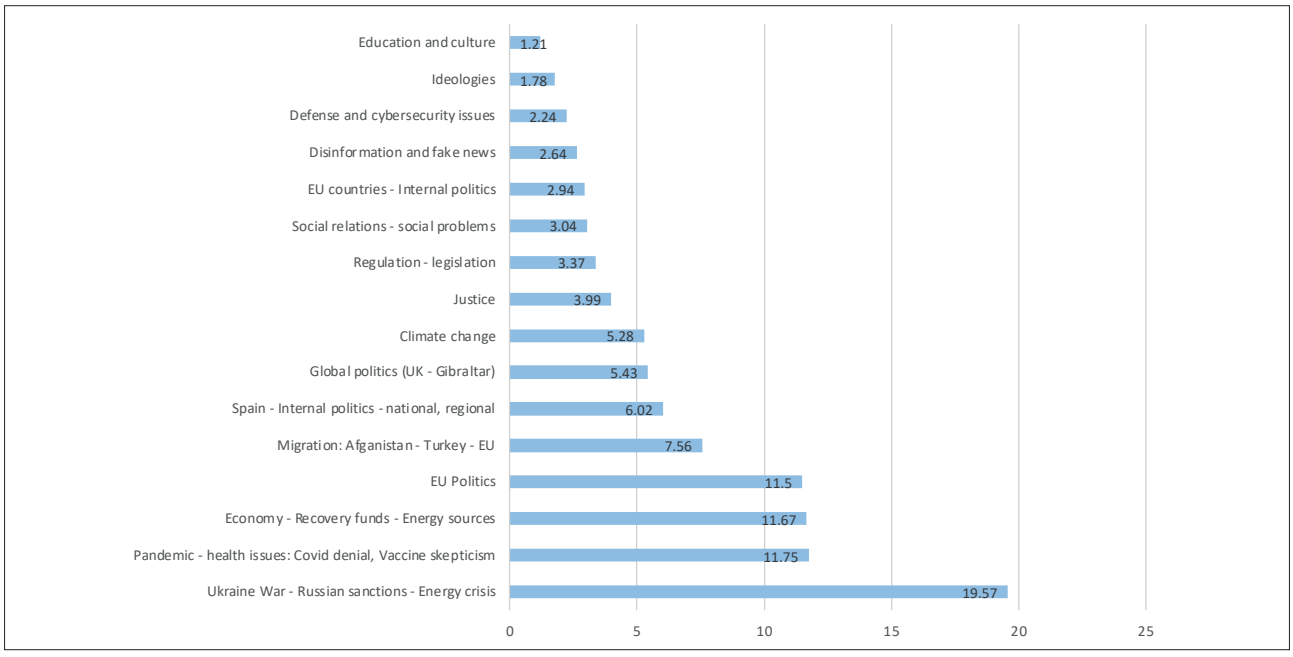
The final sample was analyzed using a two-stage approach that began with content analysis. According to **Thayer** *et al.* (2007), this method is ideal for communication research as it reveals connections between concepts and relationships between ideas that might not be immediately apparent. To ensure reliability, the research team established categories and codes to identify key discourses. A codebook was created and used by all researchers to ensure a robust and reliable analysis (**Lombard**; **Snyder-Duch**; **Bracken**, 2002; **Krippendorff**, 2013). The analytical standards were agreed upon in previous studies related to the current project (**Pedrero-Esteban**; **Pérez-Escoda**; **Establés**, 2021; **García-Carretero** *et al.*, 2022), and the team of nine researchers worked together to develop codes and meanings. Any doubts about the codification were resolved through majority voting to reach a consensus on the operational definitions of each category and maintain neutrality in the coding (**Lincoln**; **Guba**, 1985). The data was then downloaded into the *NVIVO SQR* software for further analysis.

3.3. Discourse analysis (DA)

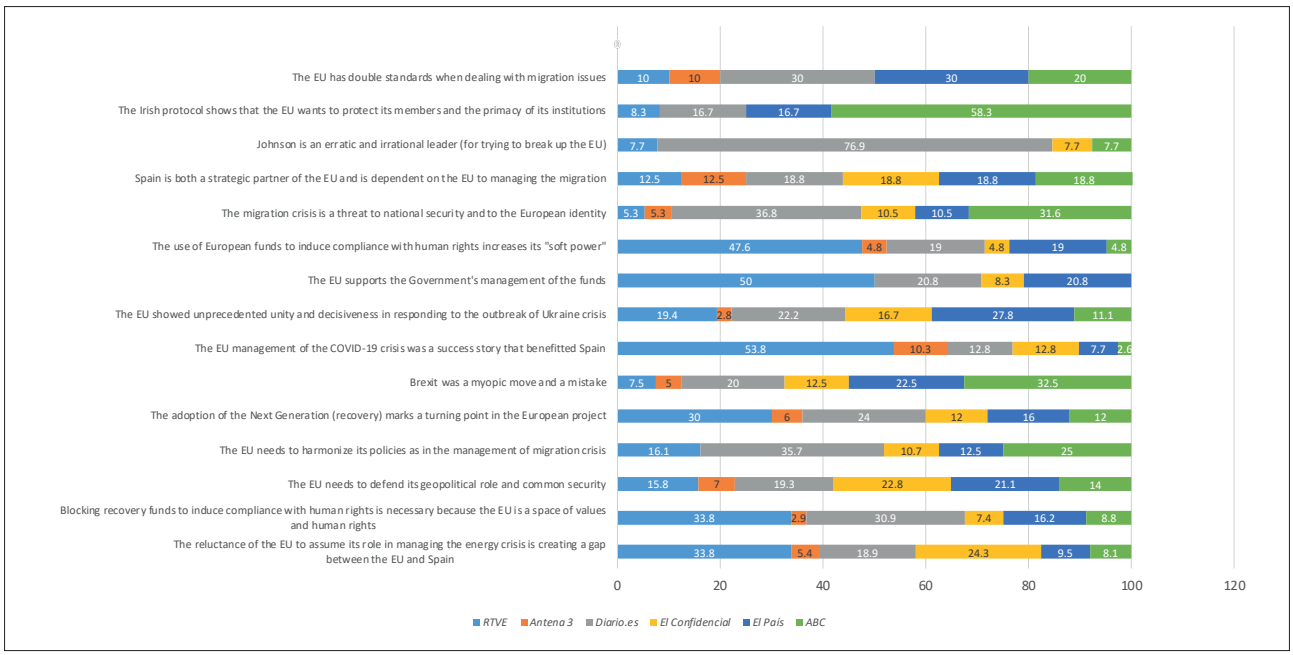
In this study, we employed a mixed methodology approach to identify major discourses present in the sample of news stories. Following **Krippendorff** (2013), this approach involved both content analysis (CA) and discourse analysis techniques. Implementing *NVIVO* with CA and discourse analysis DA techniques facilitates deriving insights from written and audiovisual content (**Krippendorff**, 2013). Based on Bernard Berelson's (**Berelson**, 1971) definition, this analysis involves the objective, systematic, and quantifiable description of manifest content to comprehend the sender, the receiver, and the message of the communication process. While the technique is flexible, it must be standardized and mechanical (**Berelson**, 1971). This is accomplished through various attributes and categories for coding within the software. The team employed a deductive approach to design the details of the attributes for analysis, including media, authorship, approach, stance towards the EU (pro/neutral/anti), journalistic genre, and semiotic elements used in each piece of information.

In the second phase of category attribution, an inductive analysis was performed, which examined the dominant themes and the primary actors involved in the narratives presented by the media. To enhance the neutrality of the coding process, the team followed a standardized approach during various working sessions to establish analysis criteria and revise each researcher's codifications per the operational definitions of each category. This process was consistent with previous work conducted by the team (**García-Carretero** *et al.*, 2022). Specifically, we systematically coded and categorized the content of the news stories based on the dominant topics that were detected, such as Covid-19, immigration, Brexit, and so forth, as can be seen in Graph 1.

To be able to detect the discourses that emerge in the context of the identified topics, we used the *Nvivo* memos, which allowed the creation of collaborative working documents that can be consulted in real-time by all members of the team. Memos enabled us to record the ideas, insights, interpretations, or growing understanding of the analyzed material. The distribution of discourse dominance within media outlets was calculated based on the proportion of each discourse present in all the discourses analyzed in the chosen media outlets during the agreed timeframe. In addition to the major discourses detected, we analyzed adjacent discourses, and counter-discourses related to the former. Adjacent discourses refer to those closely related or connected to the major discourses. Counter-discourses refer to those that challenge



Graph 1. Dominant topics



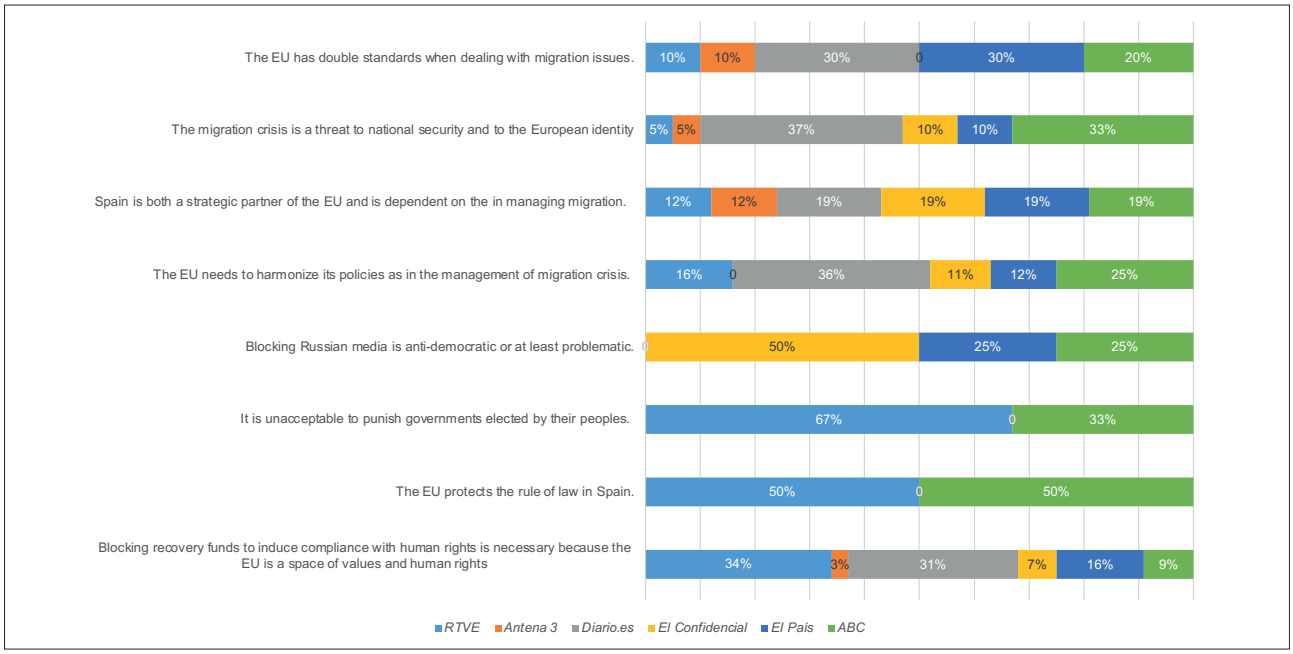
Graph 2. Major discourses and their adjacent and counter discourses per media (%)

or contradict the major discourses. The results in Graph 2 show the top eight most dominant discourses for each media outlet regarding the EU and their adjacent and counter discourses.

The construction (or deconstruction) of the EU as a Normative Power was detected in more than one discourse, whether major, adjacent, or counter. As will be further elaborated in section 4, human rights narratives can be used to frame certain discourses or can be embedded in them, as demonstrated in Graph 3.

3.4. Critical discourse analysis (CDA)

This final stage of the research used critical discourse analysis (CDA) to conduct an in-depth study of the narratives identified through content analysis. This approach aims to unravel the hidden meanings and connections in the sample. Here we find a reconfiguration of the sayable, i.e., what is said and how it is said in the identified dominant discourses, and how these discourses change overtime, and how they are appropriated by different actors (**Foucault**, 1991). We analyzed the use of rhetorical devices, framing, and other language-based techniques that can shape public opinion. CDA is not a methodology in and of itself but rather an analytical practice that allows researchers to examine social issues, power dynamics in discourse, the relationship between the text and society, and the interpretative framework (**Van-Dijk**, 2017).



Graph 3. Human rights and the rule of law related discourses per outlet (%)

4. Analysis

According to our study, narratives that construct the EU as a space of human rights values and norms are transversal, and they are embedded in different thematic discourses on the EU. However, their visibility and their role in shaping major discourses and their adjacent secondary discourses varies depending on the issue involved. For example, the coverage of the EU´s decision to withhold funds from Hungary and Poland due to democratic and human rights concerns was dominated by human rights narratives. In the coverage of other topics, such as the recurrent migration crises, human rights narratives were present but overall they were not the dominant narratives used to frame this issue. Instead, they were overshadowed by a securitarian approach to migration. In the coverage of some issues, such as discourses related to the need to strengthen the geopolitical role of the EU and the need to depend less on the United States for defending EU interests, human rights narratives were invisible. Interestingly, in the sample analyzed, the strongest human rights narratives are invoked in the context of internal debates, where the transformative power of the EU in the field of human rights is captured in relation to Member States, and less in relation to third States, as demonstrated in subsequent sections.

4.1. Allocation of *Next Generation* funds

Media discourses on the allocation of the Next Generation funds are built on an ideology schema (**Van-Dijk**, 2013) that strongly constructs the EU as a space of human rights values and the rule of law. Europeans are portrayed as strong supporters of these values. For example, in "The Europeans want the funds to go only to countries that respect the rule of law," the *ABC* gave an extensive coverage to the *Eurobarometer on the State of the Union*, highlighting that EU citizens view the rule of law and democratic values as key values that should be respected by Member States, therefore the reception of funds should be conditioned by the respect of those values (**R.C.**, 2021). Even the title chosen for this item gives visibility to the EU as a space of human rights values.

The media discourses not only treat human rights and the rule of law as pivotal for the construction of the European identity, but they also highlight the role of the European legal order in ensuring the centrality of those principles internally through institutionalization. This can be seen in news headlines such as:

> "The *Commission* will use all its powers to defend the primacy of European law in the face of Poland's challenge" (*RTVE*, 2021d),
>
> "Brussels asks the European justice system to impose economic sanctions on Poland for its assault on judicial independence,"

and

> "Brussels squeezes Hungary and Poland with revision of European funds for their authoritarian and homophobic drift" (**González**, 2021).

The discourse on the centrality of human rights and the rule of law in the EU's political and legal order continues till February 2022 when the President of the *European Parliament*, Roberta Metsola, applauds the fact that

> "the *Commission* and the *Parliament* have managed to link European funds to the democratic behavior of these governments [referring to Poland and Hungary]" (**Serbeto**, 2022b).

This discourse was also adopted by Spanish politicians. In an interview in *TVE* the socialist MEP Eider Gardeazábal applauds the *European Court*'s ruling authorizing the withholding of funds:

> "The challenge now is to explain the link between the rule of law and the budget. What we must make very clear, and not only to the governments of Hungary and Poland, but to everyone, is that the aim of this regulation is not to sanction. The aim of this regulation is to ensure compliance with the rule of law and that governments respect the rule of law" (*RTVE*, 2022a).

Another manifestation of the adoption of human rights discourses by local politicians is the declarations of Juan Fernando López Aguilar, chairman of the *European Parliament*'s *Civil Liberties Committee*:

> "...[freedom of expression] is essential for the existence of information pluralism [...] pluralism is consecrated as a superior value of democratic legal systems that deserve that name, of course this is the case of Spain, and it must also be so in the European Union [...] And we say again and again to the rulers of Hungary and Poland [...] that in no case can democracy be reduced or confined simply to the majority that supports you in *Parliament*. Because democracy is not only the Government by a majority that supports you, it is, above all, respect for minorities that oppose you" (*RTVE*, 2021e).

He further added that the EU is based on "rights and obligations. And you cannot enjoy all the rights, to vote, come here, speak endlessly in the European Parliament and then not abide by the rules that the rest of us abide by" (*RTVE*, 2021e).

The EU's decision to withhold funds from Hungary and Poland was backed by the Spanish left and the Spanish right alike. For example, in a statement by *Izquierda Unida* ('United Left'), it is emphasized that:

> "The discriminatory law against the LGTBI community passed by the Hungarian government requires a firm reaction, and I am glad to have listened today to Mr Michel and Mrs Von der Leyen's [...] clear position in defence of the rule of law" (*RTVE*, 2021c).

An example from the right could be evidenced in a statement by politicians from *Partido Popular* (*PP*) (Popular Party):

> "The European *PP* defends the rule of law among the 27 Member States, and this is an immovable principle for us. That is why we were one of the signatories to the call for European funds to be conditional on compliance with the rule of law by all parties" (*RTVE*, 2021c).

The only dissenting voice was that of the radical right wing party *Vox*, which did not support this move as expressed by Jorge Buxadé, vice-president of the party and a MEP:

> "We have not created the EU to subject the governments that have been legitimately appointed by their people to the path that it decides" (*RTVE*, 2021c).

However, even the conservative media criticize the position of *Vox* and its leadership. An example of this is the article "La caverna de Santiago Abascal" (The Cavern of Santiago Abascal), published in the conservative media outlet *El Confidencial* (**Amón**, 2021). The article criticizes Abascal's anti-European stance ("Abascal doesn't like the euro or Europe"), and his position on key human rights related issues:

> [*Vox*] poisons society with the sinister choreography of xenophobia, machismo, nationalism, anti-Europeanism, homophobia, obscurantism and resistance to the evidence of climate change. Nothing better than Abascal's messianism to excite the instincts and stimulate the emotions [...] He would like Spain to be the Hungary of Orbán, the Poland of *Law and Justice* (**Amón**, 2021).

In his sense, anti-Europeanism is associated with negative attitudes towards human rights. The discourses on the EU's commitment to human rights and the rule of law are utilized to create "us vs. them" dichotomy, with "us" being Europeanists who believe in human rights values and "them" the nationalists who challenge them, as could be seen in this quote by Juan Fernando López Aguilar:

> "In the last 10 years, anti-European seats have multiplied in the *European Parliament*, and today they applauded the nationalist and reactionary speech of Polish Prime Minister Morawiecki with avarice, and the extreme right applauded with glee. But fortunately, clearly pro-European majority is still breathing in the *European Parliament*, and it has told Prime Minister Morawiecki what he had to hear. It cannot be that a State accesses all the benefits of being a member of the European Union, including resilience and recovery funds, without fulfilling any of the obligations and duties, starting with respect for European law that all the rest of us comply with (*RTVE*, 2021e).

LGBTQ rights are invoked to create this dichotomy between "us" vs. "them." This is exemplified in the recurrent use of the term homophobia in referring to Orbán and his anti-human rights policies. This is reflected in headlines and statements such as

> "Brussels squeezes Hungary and Poland with revision of European funds for their authoritarian and homophobic drift" (**González**, 2021);
>
> "The Hungarian government is absorbed in its homophobic drift" (*RTVE*, 2021a).

RTVE goes as far as comparing Orbán's censorship of books on LGBTQ rights to policies of Nazi Germany:

> "In Hungary, they want books to be marked with a label. It is very similar to what the Nazis did with degenerate art, etc., and it's a super harmful thing to know that these are not just stories for LGBT families. They are stories for all audiences that simply show an LGBT reality" (*RTVE*, 2021b).

It is interesting to note that the narratives characterizing the EU as a space of values that must be promoted and defended by EU institutions are not contested even when Spain's own record is being criticized. When the EU criticizes Spain for its failure to renew the *Spanish General Council of the Judiciary* (*CGPJ*), narratives criticizing the EU's stance on this issue or accusing it, for instance, of interfering in internal affairs of Spain are absent, even in media outlets that are close to the Government's ideological tendencies. Instead, we find statements such as

> "it is important that European standards are taken into account and that all affected parties are consulted" (**Gil**, 2021a).

The underlying assumption of news items mentioning the EU's stance on this issue is that the EU promotes the rule of law in Spain.

4.2. Sanctions against Russian media

Very few discourses addressing the sanctions imposed on the Russian media outlets after the outbreak of the war in Ukraine criticize the EU for *deviating* from its human rights values. One line of criticism accepts the EU's assertion that Russian propaganda is dangerous; still, it presents the measures adopted by the EU to counter Russian disinformation and propaganda as contentious. For example, in an item published by *El Confidencial* the blocking of Russian media was described as "a delicate decision." While the piece does not dispute the dangerous nature of Russian propaganda, it suggests that the EU's decision could be counterproductive because Russia could ban foreign press from operating in the country. But more importantly, the item underlines the fact that Russian journalists are quitting their positions at Russian media as an act of protest against the war in Ukraine, indirectly insinuating that collective sanctions could be unfair. Another item published by the same media outlet labels the EU's measure as a "debatable precedent" and casts some doubts on the efficiency of the sanctions (**Iriarte**, 2022). A different piece published by the same outlet directly accuses the EU of deviating from its own values:

> "Faced with the authoritarian and nineteenth-century project of Vladimir Putin's regime, we cannot be a mere reflection in a mirror. Europe must defend Ukraine, but above all it has an obligation to defend principles and values. Because the war in Ukraine is also about that" (**Julibert-González**, 2022).

The characterization of Putin as authoritarian and dangerous does not prevent the media from questioning the legitimacy of the EU's measure claiming that the Ukraine's war is not Europe's war:

> "It is a thorny decision [to block Russian media] which we can only understand in the dialectic of war, a space for which there is no respect for the rule of law. But is Europe at war? It is not a rhetorical or trivial question. It is an issue that we must define clearly. If the answer is no, and that seems to be the case judging by what our leaders declare, applying these types of measures once again results in a frontal attack on our way of seeing the world (**Alarcón**, 2021).

A different line of criticism rejects the EU's blanket characterization of all Russian media as propaganda and criticizes the EU's decision to block them. This is reflected, for example, in the item "Propaganda and cynicism," published in *El Diario*:

> "The answer to those who censor is not more censorship, but more journalism and democracy. In those media there are also interesting points of view and truthful news that we don't see here. We have the right to know all the sides in order to understand why we are where we are. Western propaganda wants to impose the single narrative of pro-*NATO* warmongering in which there is only one bad guy and there are no other causes to explain the conflict" (**Gallego**, 2022).

This piece suggests that the EU is not giving due regard to the value of media pluralism and reverses the EU's accusations on Russia's toxic propaganda by accusing the "West" of launching its own propaganda.

As for political parties, the only party that manifestly criticized the EU's sanction against Russian media is radical left-wing party *Podemos*:

> "Regarding the measures that the EU is preparing to veto the Russian media *Russia Today* and *Sputnik*, the leader of the formation [of *Podemos*] has said that both can be 'propaganda media' of the Kremlin, but has added that the possible censorship opens, in his opinion, a 'dangerous spiral', given that Russia can 'question' foreign media correspondents in Moscow, which 'does not benefit' 'neither one side nor the other' (*El País*, 2022).

This suggests that the construction of the EU as a Normative Power is questioned due to the adoption of measures that are perceived as anti-democratic.

4.3. Discourses on migration

Discourses on the recurrent "migration crises" demonstrate that, in some contexts, narratives on human rights values yield to securitarian narratives. This is consistent with previous studies that emphasize the primacy of nationalistic rationale in addressing migration issues, often linking migration to illegal and criminal activities (**Ferreira**, 2019; **De-Sousa-Ferreira**; **Alonso-Riveiro**, in press). While the management of "migration crises" have clear human rights implications, the latter are overshadowed by narratives that frame migration as primarily a security issue. The framing of migration crises whether as a humanitarian issue or as a security issue reflect different constructions of Europe where universal values compete with local values. This tension is captured by the following quote from a piece discussing the crisis in Calais in *El País*:

> "Sovereignty and nationalism returned to the core of Western political vocabulary after decades of rhetoric about globalization and liberal and universal values" (**Bassets**, 2021).

Politics of fear (**Wodak**, 2015) are deployed to frame migration as a security issue, as the use of certain terminology indicates. Repeatedly, some media outlets, particularly conservative ones, use hyperbolic expressions and metaphors, related to natural threatening phenomena, such as 'flood' and 'tide' to talk about migratory flows, as illustrated by the following headline in an *ABC* piece that brings both concepts together:

> "Lukashenko threatens with flooding the EU with a tide of migrants" (**Serbeto**, 2021b).

Another example is the "new wave of displaced persons towards the center of Europe" right before the invasion of Ukraine (*El Confidencial*, 2022). Furthermore, war vocabulary is also used to deal with the so-called "migration crises." A good example is the following:

> "Calais, and the entire coast in northwestern France, is the front where the new battles are being fought –without real weapons, but with catastrophic human cost and high diplomatic tension– in the third decade of the 21st century".

Moreover, the item describes the crisis as a "battle of sovereignty" (**Bassets**, 2021). This fear-provoking vocabulary eventually overshadows human rights narratives and has bearing on the way human rights narratives are constructed.

Very often, the securitarian framing coexists with a human rights perspective. The human rights/securitization duality could be detected in the discourses of EU officials covered by the Spanish media. For example, Von der Leyen is quoted saying

> "Lukashenko's regime exploits people by taking advantage of their suffering to benefit its own ends. It has no scruples" (**Gil**, 2021c).

At the same time, she uses a strong securitarian language, stating that the EU

> "has suffered a hybrid attack organized by the Lukashenko regime" (**Gil**, 2021c).

However, the human rights narratives usually focus on violations committed by non-EU actors and much less on the human rights obligations of EU Member States (EUMS) in relation to migrants and refugees. For example, in the crisis provoked by Belarus, EU officials speak of imposing sanctions on airline and transportation companies for their complicity in the "human trafficking" of migrants in connection to the crisis created by Belarus:

> "The recent events at the EU border with Belarus could not have taken place without certain transport operators knowingly or unknowingly contributing to the exploitation of people, at enormous human and security cost at the EU's external borders, and stability in the region […] The *Commission* proposes a new legal framework that allows the EU to adopt specific measures against the operators of any means of transport (land, air, or by waterways and sea), who participate in or facilitate human smuggling or trafficking into the European Union" (**Gil**, 2021c).

In comparison, the disregard of human rights obligations by EUMS is countered by a softer tone of criticism and with lack of actions. For example, the deployment of soldiers by Poland on its borders and its refusal to ask the help of *Frontex*, and the building of a wall are perceived as "colliding with European legislation on refugees" (**Serbeto**, 2021a). However, the tone is softer, even in case of a Member State that is facing sanctions due to rule of law concerns:

> "The European Commissioner for the Interior, the Swedish Ylva Johansson, has gently warned that Poland should be 'more transparent' when it comes to protecting its borders with Belarus. And the president of the *European Parliament*, David Sassoli, 'alarmed' by the situation on the border, asked Poland to accept the intervention of *Frontex* to defend itself against the 'political power games' of the Belarusian dictatorship (**Serbeto**, 2021a).

The use of the terms "gently" and "asked" attest to a softer tone used to denounce the actions of a Member State in this specific context. Other forms of denouncements include the following statement of the spokesperson for the *European Commission*, Eric Mamer:

> "Our position is that EU funds should not be used to build walls, which is not the same as saying that physical barriers cannot be built" (**Gil**, 2021b).

Financing the wall is presented as a contentious issue that divides European leaders. On the one hand, Austria, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Greece, Hungary, Lithuania, Latvia, Poland and Slovakia have signed a letter calling for the financing of physical barriers by EU funds. The President of the *European Council*, Charles Michel, seems to support the argument that financing the wall is consistent with EU regulations. On the other hand, Ursula Von der Leyen, voices a clear opposition to using community money to build fences and gates (**Gil**, 2021b). A harsher criticism comes from the framing of the media itself:

> "The *European Commission* remains in its refusal to pay, from the community budget, walls against migrants like the one that Poland insists on building on the border with Belarus. Poland, which has received a new blow from the European justice this Tuesday for its assault on the country's justice and that has banned journalists, humanitarian organizations and EU entities such as *Frontex* from accessing the border with Belarus" (**Gil**, 2021b).

The media also criticizes the concept of "Fortress Europe," as reflected in statements such as

> "...[the EU's door] has slammed shut, claiming the lives of at least eight migrants so far" (**Glensk**; **Vulliamy**, 2021).

The media highlight the obstacles that human rights and humanitarian organizations are facing in attempting to provide necessary services for migrants and refugees in Poland:

> "*Médecins Sans Frontières*' emergency manager, Crystal Van Leeuwen, told *The Guardian* last week that NGOs urgently need access to the safety zone to guarantee migrants' right to international protection" (**Glensk**; **Vulliamy**, 2021).

Some voices attempt to prioritize European values in the management of the crisis, such as the statement of Iratxe García, the leader of the *Progressive Alliance of Socialists and Democrats* group in the *European Parliament*:

> "...let's not get caught up in the extreme right's agenda, but rather defend the Europe that tore down walls, the Europe of solidarity. Let's take advantage to face the new threats, we are part of a union of values" (**Gil**, 2021c).

The dual human rights/securitization discourse was also evident in news items on the English Channel crisis, which gives rise to securitarian discourses, such as

> "the French government wants to achieve a common effort from the EU, reinforcing border mechanisms" (**Quiñonero**, 2021).

A similar discourse is presented in another piece by *ABC*:

> "The interior ministers of France, Germany, the Netherlands and Belgium, accompanied by representatives of the EU, *Frontex* and *Europol*, in Calais, summoned by the Government of Emmanuel Macron, agreed on Sunday afternoon to increase judicial and police measures to combat migration organized by mafias specialized in human trafficking, trying to take advantage of the 'attractiveness' of the UK's social and immigration policies" (**Quiñonero**, 2021).

At the same time, France (and the UK) denounces the actions of criminal groups specialized in human trafficking, and the French president announces that

> "France will not allow the English Channel to become a cemetery" (*EFE*, 2021).

Here, the human rights narrative focuses almost exclusively on tackling criminal organizations involved in human trafficking, diverting the attention from international human rights obligations of EUMS.

In fact, Gérald Darmanin, the French Minister of the Interior is quoted as saying

> "We [the interior ministers of France, Germany, the Netherlands and Belgium] also thought it important to remember that the British government should reduce the appeal of its immigration and asylum policies. Mafias and migrants think they can find work more easily in England, benefiting from more facilities to get papers to regularize their situation" (**Quiñonero**, 2021).

This criticism on the "appealing" immigration policies is hard to reconcile with human rights discourses that require States to respect international law standards on the right to seek asylum. Official discourses could be contrasted with discourses propagated by human rights organizations that require States to guarantee the safety of migrants and their right to seek asylum pursuant to international standards, such as the following statement, as indicated by Enver Solomon, executive director of the *Council for Refugees*:

> "How many tragedies like this do we have to see before the government fundamentally changes its approach by committing to an ambitious expansion of safe routes for those men, women and children who desperately need protection?" Every day, people are forced to flee their homes through no fault of their own. Now is the time to end the cruel and ineffective tactic of trying to punish or drive away those who try to find safety in our country" (**Harrison** *et al.*, 2021).

The duality of human rights/security disappears with the outbreak of the Ukrainian crisis. The securitarian language is replaced with broad manifestations of solidarity with Ukrainian refugees throughout the EU. Media discourses on migration undergo a transformation (**Foucault**, 1991) by focusing primarily on the humanitarian aspects of immigration, and Spain's and EU's solidarity with the Ukrainian refugees. This is reflected in statements such as

> "...we see that solidarity, that avalanche of help that all Ukrainians are receiving, all the Ukrainian women who are leaving your country with that load, with that suitcase, with that car for the children" (*RTVE*, 2022b).

Even the discourses of the conservative European leaders change, as reflected in the discourse of the Austrian Chancellor Karl Nehammer:

> "We are a European family and families support each other" (**Serbeto**, 2022).

The Media analysis demonstrates a strong sense of unity among the 27 regarding the Ukrainian crisis, and therefore, a consensus within the EU around the defense of its values, through the humanitarian support of those fleeing the conflict. European solidarity towards the "Ukrainian exodus" (*RTVE*, 2022b) is praised in all media outlets.

This leads to the emergence of critical discourses that accuse the EU of double standards in the management of the refugee crisis as reflected in one opinion piece:

> "We saw the division that occurred in 2015 after the Syrian war, when only Germany received the refugees and those refugee quotas were denied by those Eastern countries, especially Hungary, Poland. And how, now, the doors are open to the Ukrainians without hardly putting up any kind of obstacles. The fast refugee situation is not recognized. And there is even talk that they can stay between one and three years, provide health, education and that they can even have their own job anywhere in Europe where they are going to be considered refugees" (*RTVE*, 2022c).

Accusing the EU of adopting double standards undermine the construction of the EU as a Normative Power or at least expose the limitations of the notion of NPE.

5. Discussion and conclusions

Diez and **Manners** (2007, p. 174) argue that a successful discursive presentation of the EU as a normative power constitute

> "a precondition for other actors to agree to the norms set out by the EU; it also constructs an identity of the EU against an image of others in the 'outside world'."

Our analysis demonstrates that in discussing EU related issues, human rights narratives are used very often to construct the EU as an actor characterized by its commitment to human rights values and the rule of law. This conceptualization of the EU shapes and informs media discourses on key issues related to the construction of the EU´s identity and its international role. The human rights jargon is part of the lexicon used in media discourses. Still, our study reveals that there is a lack of consistency in the reference to human rights in constructing the role and the identity of the EU.

In some discourses, such as the discourses on blocking Poland and Hungary from receiving European funds due to human rights and rule of law concerns, the construction of the EU as a *Normative Power* overshadows any other argument

or concern. Even the minority opinion of *Vox*, does not manifestly refute the centrality of human rights in the European political order, it refutes promoting them by impinging on State sovereignty. The discourses on the *Next Generation*'s funds also highlight how the EU would (and should) use its economic power to underpin its normative power, in order to guarantee compliance with human rights norms. The response to internal challenges or defiance posed by Hungary and Poland is utilized to reconstruct the normative power Europe (NPE). Perhaps this reflects a conviction that internal democratic backsliding constitutes a serious threat to NPE, both internally and externally.

However, our analysis also demonstrates that even when the assumption that the EU is a space of human rights and values is not contested, the interpretation of those values could be challenged. This is evident in the case of LGBTQ rights, contested by radical right-wing parties, and in the case of the sanctions against Russian media, where some dissent is present accusing the EU of deviating from democratic values. Lack of internal consensus and coherency on the interpretation of human rights could weaken the image of the EU as a normative power and could trigger accusations of hypocrisy and or even imperialism when the EU attempts to promote internally contested rights in its external actions.

It is worth noting that the construction of the EU as a Normative Power in Spanish media relies heavily on the accounts and statements of EU officials and of politicians and other actors such as civil society. The media tend to give visibility to such accounts portraying the EU as NPE and subsequently endorse them.

Another interesting insight that could be inferred from media discourses on LGBTQ rights and the creation of the "us *vs.* them" dichotomy is that human rights discourses could be used to reinforce power asymmetry between the West and the East in Europe, i.e., between the true Europeans and less true Europeans. In this sense, NPE could be used not only to construct the external other, but also to construct internal "othering," or making a certain European State foreign (**Diez**, 2005).

But most importantly, the discourses on the recurrent migration crises demonstrate that human rights narratives retreat in the face of securitarian ones. Our analysis demonstrates that securitarian framing is very effective in marginalizing human rights narratives in discussing the EU. This is achieved through resort to "politics of fear" to marginalize human rights discourses. Securitarian discourses also set the limits of human rights discourses that could accompany them. This is reflected in the tendency to focus on certain human rights violations committed by actors other than the EUMS while downplaying the failure of EUMS in respecting EU human rights values. Also, identity questions shape human rights discourses, as was evident in the discourses on the Ukrainian crisis, where expressions of solidarity framed the debate. Discourses on migration also demonstrate that different EU actors speak in a different voice on human rights issues. These different voices can challenge or even contradict each other.

Manners (2008, 60) argues that

> "the EU might be one of the most important normative powers in the world because of its ability to establish normative principles and apply them to different realities. It is this application of normative principles to different realities that is central to the EU's normative ethics –it should 'live by example'".

Nicolaïdis and **Nicolaïdis** (2006, p. 348) argue that

> "normative power can only be applied credibly under a key condition: consistency between internal policies and external prescriptions and actions."

The discourses on migration are a clear example of an area in which the EU fails to apply its norms consistently and fails to lead by example.

The gap between the abstract human rights rhetoric in media discourses and the actual measures adopted in relation to the recurrent migration crises undermine the conceptualization of the EU as a Normative Power. In fact, the perceived "double standards" in the treatment of refugees and migrants contradicts and challenges the representation of the EU as a "force for good;" this could debilitate the role of the EU as a normative power, especially towards third States. But most importantly, the increasing securitization of migration debilitates the position of the EU as a normative actor, even on the discursive and rhetorical level. The transformation of discourses on migration back and forth between security narratives and human rights narratives contradicts one of the basic tenets of NPE, which assumes that EU's actions are driven primarily by universal normative considerations and not narrowly defined self-interests.

Limitations

This study on the construction of the EU as a normative power has two limitations. First, the media analysis covers a limited timeframe (from July 2021 to March 2022).

The second limitation of our study is its exclusive focus on Spanish media outlets. Spain has been characterized, historically, by the existence of a strong pro-European consensus among political elites in the country.

Despite the study's limitations, the analysis has highlighted how human rights narratives are used to devise the EU as a *normative power*, while at the same time highlighting the existing divergences within the conceptualization of NPE, particularly regarding the articulation between identity and power.

6. Notes

1. According to **Maull** (1990), being a civilian power implies

> "1) the acceptance of the necessity of cooperation with others in the pursuit of international objectives;
>
> 2) the concentration on non-military, primarily economic, means to secure national goals, with military power left as a residual instrument serving essentially to safeguard other means of international interaction; and
>
> 3) a willingness to develop supranational structures to address critical issues of international management".

2. An idea that has been the object of criticism by some academics given its idealist character (**Rodríguez-Prieto**, 2019, p. 78).

3. This includes the creation of the new pillar structure, which included one –the second– centered on the *Common Foreign and Security Policy* (*CFSP*), which was followed by the creation of the *European Security and Defence Policy* (*ESDP*), the EU responsibility for the Petersberg tasks, and the creation of a rapid reaction force and a police force, as agreed at the Cologne (1999), Helsinki (1999) and Santa Maria de Feira (2000) *European Councils*. Progress that, after a few years of impasse, would continue with the *Common Security and Defense Policy* (*CSDP*), the *Permanent Structured Cooperation* (*Pesco*), the *2016 Global Strategy*, and the 2022 strategic compass.

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Use of disinformation as a weapon in contemporary international relations: accountability for Russian actions against states and international organizations

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Abstract

We have chosen to study international responsibility for carrying out disinformation campaigns, aiming to assess the importance and progress that the use of disinformation campaigns has obtained in contemporary international society as a geopolitical weapon, much like other well-established means such as the use of force. We focus on the situation with Russia because it has become apparent not only to specialized researchers but also to all citizens through the mainstream media that Russia has used disinformation campaigns to cloak its invasion of Ukraine in a smoke cloud of lies and half-truths. Thus, we found that, in the case of the Russian disinformation campaigns, the full circle of the accountability relationship has been completed. The Russian state has been accused of or blamed for carrying out these disinformation campaigns. The violation of certain international obligations has been reported, and it has been held accountable or even sanctioned for this. In light of these findings, it can be concluded that disinformation campaigns are becoming increasingly important as a tool of geopolitics or international relations, either on their own or in conjunction with other, more classic weapons in international society, such as the age-old use of force.

Keywords

International accountability; Disinformation; Cyberattacks; Fake news; Use of force; Countermeasures; International wrongful acts; Sanctions; International relations; European Union; *NATO*; Rusia; Ukraine.

1. Introduction

The prominence of cyberattacks, as a regular feature at the forefront of contemporary forms of crime around the world, is no longer a novel effect. Most probably, the readers of this article themselves have suffered some form of cyberattack aimed at financial gain at one time or another, in person or at the institutions where they work. In parallel to these cyberattacks, which alter the computer systems of those affected –whether individuals, companies, or public institutions– for financial motives, other attacks aimed at altering public opinion and thus damaging the democratic function of both states and international organizations are increasingly taking place, and thus becoming part of international relations and the geopolitical landscape.

The latter type of action has come to be known as "disinformation" campaigns. For the moment, we can define this expression briefly as

> "[...] the intentional dissemination of inaccurate information that seeks to undermine public confidence, distort facts, convey a certain way of perceiving reality, and exploiting vulnerabilities with the aim of destabilizing" (**Olmo-y-Romero**, 2019, p. 4)

since, in the following section, we will delve more deeply into this concept and try to distinguish it from related ideas.

In this regard, it should be emphasized that, although deception techniques have always been employed for the purposes of politics or war (*Centro Criptológico Nacional*, 2019, p. 5), nowadays their danger and scope have increased owing to the technological revolution that has taken place worldwide, making them a serious global risk (**Shao** *et al*., 2018, p. 2). Furthermore, experts have pointed out various factors that are contributing to the proliferation of these disinformation campaigns: First, it is necessary to highlight their high level of effectiveness owing to current technological capabilities and to the fact that, typically, they affect social vulnerabilities that already exist in the society being attacked, or that, like weeds among the wheat, elements of the illegitimate disinformation are inserted into legitimate means of social and political communication, thereby increasing their plausibility (*Centro Criptológico Nacional*, 2019, pp. 5-7).

Second, their recurrence could be explained by the difficulty of determining who is responsible for the campaigns and by the obstacles to figuring out the connection between the orchestrated campaign and the influence it has had in changing public opinion about the entities that were victims of the attacks (*ibid.*).

Third, the replacement of traditional media by social networks as reliable information channels weakens receivers' defensive capabilities because, as several experts have warned, one consequence of the social network empire is that, when compiling stories from multiple sources, the focus is on the story and not as much on its source, as well as because endorsements and recommendations –rather than the traditional gatekeepers of established media or ingrained reading habits– guide readers on social networks (*ibid.*; **Messing** *et al.*, 2012, p. 3; **Wardle** *et al.*, 2017, p. 12).

Finally, the scope and dangerousness of disinformation campaigns have escalated owing to the intrinsic difficulty faced by democratic societies when it comes to legally prosecuting these hostile actions against our societies (**Iosifidis** *et al.*, 2020, p. 64), unlike with other more unambiguously offensive conduct, such as armed attacks, terrorist actions, or even computer attacks on systems or hacks. Indeed, it is difficult to combat disinformation without at the same time attacking the fundamental principles of democratic states and societies, such as freedom of expression and opinion, which underpin the fundamental individual rights of both nationals and foreigners.

In the context of this monograph, which is dedicated to the importance of disinformation in international relations, we would like to emphasize that states, and some international organizations such as the European Union (EU) itself, have increasingly acknowledged having been subjected to massive disinformation campaigns, especially in electoral or political contexts, either by internal groups, as in the recent election campaigns in Germany (**Delcker**; **Janosch**; 2021), or by third countries, with the specific objective of discrediting and delegitimizing elections (*United States Senate Select Committee on Intelligence*, 2017). For example, as recently as September 2021, the *EU High Representative for Foreign Affairs and Security Policy*, Josep Borrell, said that some member states had observed malicious cyber activity, referred to collectively as "ghostwriter," which endangered integrity and security and had linked them to the Russian state. The *High Representative* stated that these malicious cyber activities targeted EU parliamentarians, government officials, politicians, and members of the press and of EU civil society by accessing computer systems and personal accounts and stealing data. Borrell concluded that these activities were contrary to the norms of responsible state behavior in cyberspace that had been endorsed by all members of the *United Nations* and that such activities were intended to undermine the democratic institutions and processes of the EU member states,

> "[...]including by enabling disinformation and information manipulation, in particular by enabling disinformation and manipulation of information" (*Council of the European Union*, 2021).

Naturally, as soon as these disinformation campaigns began to be detected, international organizations and states tried to put in place the means to counteract them both legally and through the implementation of other more informal means (**Espaliú-Berdud**, 2022, pp. 4-6). For example, in March 2015, the *European Council* required the *EU High Representative for Foreign Affairs and Security Policy* to prepare an action plan on strategic communication (*European Council*, 2015, point 13), which led to the creation of the *East StratCom Task Force*, operational since September 2015, which is part of the *Strategic Communications and Information Analysis Division* of the *European External Action Service*. Its main mission is to develop communication elements and information campaigns aimed at better explaining EU policies in the countries to the east. For example, one of the star projects of the *East StratCom Task Force* was the 2015 creation of *EUvsDisinfo*, which consists of a portal and a set of databases designed to better anticipate, address, and respond to current disin-

> Like weeds among the wheat, elements of the illegitimate disinformation are inserted into legitimate means of social and political communication, thereby increasing their plausibility (*Centro Criptológico Nacional*, 2019, pp. 5-7)

formation campaigns from the Russian Federation that affect the EU, its member states, and neighboring countries.

> It is difficult to combat disinformation without at the same time attacking the fundamental principles of democratic states and societies, such as freedom of expression and opinion, which underpin the fundamental individual rights of both nationals and foreigners

Moreover, one must remember that the severe acute respiratory syndrome coronavirus 2 (SARS-COV-2) pandemic, more popularly known as coronavirus disease 2019 (COVID-19), has been accompanied by powerful disinformation campaigns, casting an even longer shadow over the situation already described, reaching a point where the *World Health Organization* has described the situation as an "infodemic" (*World Health Organization*, 2019, p. 34).

Thus, for example, in a joint communication in June 2020, the *European Commission* and the *High Representative of the Union* warned that, among the many harmful elements of the pandemic, some foreign actors and certain third countries, including Russia, had launched disinformation campaigns about Covid-19 in the EU, in its neighborhood, and globally with the aim of undermining democratic debate and exacerbating social polarization (*European Commission* and *High Representative of the European Union for Foreign Affairs and Security Policy*, 2020, p. 4). Subsequently, these Russian-based disinformation campaigns were documented in detail as the pandemic dragged on (*European External Action Service*, 2021).

However, it should be noted that, insofar as disinformation companies are sponsored by other states and form part of a hybrid threat from abroad, they could come to be considered a security threat (**Baade**, 2018, p. 1358), and the responses to such situations can be found within the framework of public international law, in particular Chapter VII of the *United Nations Charter*. Thus, as Suárez-Serrano points out:

> "If a disinformation campaign reaches the capacity to put peace and security at risk, it should be formally designated as a threat, and the responsible state might be sanctioned in the way considered by the *UN Security Council*" (**Suárez-Serrano**, 2020, p. 140).

Unfortunately, the invasion of Ukraine in February 2022 is proving the plausibility of these hypotheses. In fact, let us recall that the Russian authorities devised a series of arguments as justification for the invasion, which they called, as is well known, a "special operation" –an action to put an end to the massacres of pro-Russian separatists in the Ukrainian regions of the Dombas because they considered it necessary to overthrow the legitimate Ukrainian government for being "neo-Nazi," and to protect both Russia and Ukraine from a possible rapprochement to the EU and the *North Atlantic Treaty Organization* (*NATO*); **Corral-Hernández**, 2022, p. 6). As the war has unfolded, other campaigns defending the *Kremlin*'s narratives about the war in Ukraine –such as denying the Bucha massacre and inciting fear among European citizens about how sanctions against Russia would ruin their lives, etc.– have been detected (**Alaphilippe** *et al*., 2022).

It is therefore becoming less and less over-the-top to point out, as many observers have already done, that Russia is now once again using "active measures", a term borrowed from the lexicon of the *Soviet Union's Committee for State Security* (*KGB*) during the Cold War (**Colom-Piella**, 2020, p. 474) to describe a form of political warfare involving, among other things, the use of fake news, as well as forged letters disseminated on social media, to influence public opinion in target countries (**Lanoszka**, 2019, p. 227).

However, in spite of the confirmation of all these data and despite the fact that many years have passed since these strategic disinformation campaigns began to be detected, there are experts who question the reach of these campaigns. For example, Professor Lanoszka has stated that

> "[...] the strategic effects of international disinformation campaigns are exaggerated" (**Lanoszka**, 2019, p. 229).

Similarly, Andrew Dawson and Martin Innes point out that

> "[...] we need to be wary of over-attributing any causal effects to even the most sophisticated disinformation campaign" (**Dawson**; **Innes**, 2019, p. 245),

as well as that

> "[...] there is actually remarkably little robust evidence that such disinforming communications have a discernible measurable impact upon how the majority of people think, feel or act" (*ibid.*, p. 255).

For them, therefore,

> "[...] it is more appropriate to argue that disinformation has more impact in shaping the issues we collectively think about, than what we individually think" (*ibid.*).

Hence, we propose examining the possible relationship of international responsibility arising from the use of disinformation campaigns as a means to shed light on this debate, namely to determine the relevance and scope of the use of disinformation campaigns in international society as a tool of international relations. Recall that responsibility is the legal institution, essential to any legal system, including the international one, that demands that the breach of any

obligation existing between two or more parties creates a new obligation, that of repairing the damage caused by that breach or at least restoring the legal situation to the moment prior to the breach. The legal system of responsibility in international law –which has been clarified mainly through codification and progressive development carried out by the *International Law Commission* (*ILC*), a subsidiary body of the *General Assembly of the United Nations* (*UN*), since 1949– involves making a claim against the acting party that has caused the act so that they will take responsibility for the consequences of their actions and to do everything possible to restore the legal situation to its original state, for example, by repairing the damage caused, etc.

> "The Russian authorities devised a series of arguments as justification for the invasion, which they called, as is well known, a "special operation" –an action to put an end to the massacres of pro-Russian separatists in the Ukrainian regions of the Dombas because they considered it necessary to overthrow the legitimate Ukrainian government for being "neo-Nazi"

Thus, returning to the context of disinformation campaigns, if, in addition to indicating the state that has used such means, the affected states have already proceeded to hold the other state internationally responsible and, as appropriate, to claim reparations from it, we could argue that disinformation campaigns are already considered to be a true wrongful act whose execution generates the normal consequences attributable to other wrongful acts in international law, such that they have already reached a certain maturity as a legal institution in this system. In this way, they would have already moved beyond the initial stage in which they are the object of mere cross-accusations between states without any major consequences apart from serving as another possible form of international wrongdoing –hence, their use as a geopolitical tool, or weapon, but one that is already sufficiently known and targeted by adversaries.

In particular, we plan to study the case of disinformation campaigns attributed to Russia because, since this state recently engaged in the use of armed force when invading Ukraine, examining Russian disinformation campaigns will allow us to deepen our understanding of the importance of using these tools across the spectrum of their geopolitical usage –from political or economic rivalry with other nations to hostility or war. In addition, the fact that this is a real war that is still going on today gives the issue high visibility, which triggers reactions, narratives, and actions from other international actors beyond those strictly involved.

To examine the handling of Russia's possible international responsibility for violating international obligations by using disinformation campaigns, I believe that we should follow the structure of the rules contained in the *ILC*'s draft articles on *International Accountability of States For Internationally Wrongful Acts*, submitted for consideration by the *UN General Assembly* in 2001. It should be remembered that, without proposing a pact, the *General Assembly* submitted the draft for the consideration of the states in 2002 (*United Nations*, 2002). Of course, as they are not part of a pact, these rules are not binding in themselves, although some of them would be binding because they reflect customary international law on the subject. After article 1 has established the basic rule on the subject, namely that

> "every internationally wrongful act of a State entails its international accountability,"

article 2, to be exact, of the aforementioned draft establishes that an internationally wrongful act occurs when conduct consisting of an act or omission is attributable to the state under international law and constitutes a breach of an international obligation. Likewise, according to the rules of the regime of international responsibility of states for the committing of wrongful acts, if it is demonstrated that the conduct of the state can be considered to be a wrongful act, and there are no circumstances in the specific case that exclude the wrongfulness of the particular act, a new legal relationship will be established between the holder of the obligation breached and the state that has carried out the breach, which will essentially consist of the obligation to put an end to the wrongful act, to give guarantees of non-repetition, and to make full reparation for the damage caused by the internationally wrongful act.

To this end, after a section devoted to an in-depth study of the concept of disinformation, we will analyze how the conditions for attributing unlawful behavior to Russia have been justified in practice in the third section. In the fourth section, we will address the question of the reality of handling the target element of international responsibility as a possible breach of an international obligation. In the fifth section, we will examine the scenario of possible cases of the states or international organizations concerned the Russian state responsible once those other states or international organizations have established or, at least, imputed its perpetration of the breach of the international obligations.

Primarily, given the nature of the journal in which this article is included, we will mainly follow the methodology of the legal sciences, analyzing primary sources such as international treaties; the resolutions of international organizations, such as those of bodies and agencies of the *UN*, the *CE*, the *Council of Europe*, and *NATO*; the case law of international courts on the subject; and the treatment of the question of international mechanisms for the protection of human rights or the application of applicable international treaties. In parallel, as regards secondary sources, we will make use of the most relevant and recent doctrinal developments on disinformation and related concepts, both in Spain and internationally, as well as those related to the use of "disinformation" as a tool or weapon in the international relations sphere.

2. The concept of disinformation and distinguishing it from related notions

In an era of infosaturation, or information overload, and of informational banalization, or content inconsequentiality (**Valverde-Berrocoso** *et al*., 2022), and one in which traditional media and journalists are replaced by the so-called horizontal media, such as social networks, where there is no screening and the propagator communicates directly with his audience (**Bernal-Hernández**, 2021, pp. 95-96), there are several information disorders with similar profiles that one must try to distinguish to delve deeper into the phenomenon that concerns us herein and shed more light on this matter for the reader. However, it should be noted that the task of distinguishing one type from another in this area is not simple, since, as Claire Wardle and Hossein Derakhshan warn,

> "[...] the complexity and scale of information pollution in our digitally-connected world presents an unprecedented challenge" (**Wardle**; **Derakhshan**, 2017, p. 10).

For example, these authors start with the generic classification of "information disorders", and focus on the distinction between "disinformation," "mis-information," and "mal-information." Thus, for Claire Wardle and Hossein Derakhshan, these are defined as follows:

> "*Dis-information*. Information that is false and deliberately created to harm a person, social group, organization or country.
> *Mis-information*. Information that is false but not created with the intention of causing harm.
> *Mal-information*. Information that is based on reality, used to inflict harm on a person, organization or country" (*ibid.*, p. 20).

Here, however, we will focus on distinguishing the terms most widely used in recent years and in the context of this article, without delving into the other terms that have undeniable connections with them in the framework of communication, such as "manipulation" techniques, which are a communicative and interactional practice in which the person who carries them out, as Teun Van Dijk points out, exercises control over other people, generally against their will or against their interests (**Van-Dijk**, 2006, p. 51). As an example of manipulation, Van Dijk cites a speech given by then Prime Minister of the United Kingdom, Tony Blair, in March 2003 to obtain the *British Parliament*'s approval for the British armed forces' participation in the Iraq war (**Van-Dijk**, 2010, p. 187). The term "control of the narratives" can also be considered similar to the ones we are considering here, both in its positive connotation referring to the surveillance activities carried out by public authorities or other social agents to prevent forms of criminality in cyberspace (**Altheide** 2004, pp. 229-234; **Hetland**, 2012, p. 9) as well as in its negative connotation as the ways of influencing the discourses that are dumped onto these communicative channels by other agents with intention to dominate, manipulate, etc.

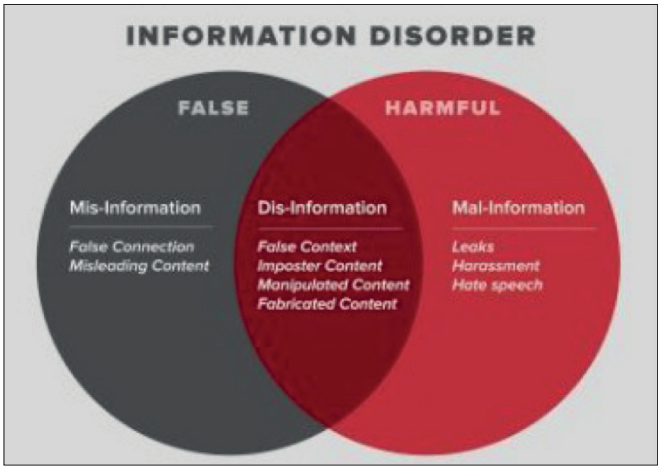

Figure 1. Informational disorder according to Claire Wardle and Hossein Derakhshan (**Wardle**; **Derakhshan**, 2017, p. 20)

Starting with the concept of "disinformation" itself, which has been defined in the introduction, it is worth noting the concurrence of three elements:

- lack of rigor or falsehood in the information;
- conscious dissemination of that flawed information; and
- intention to cause harm in the recipients or in the victim society itself (**Olmo-y-Romero**, 2019, p. 4; **Wardle**; **Derakhshan**, 2017, p. 5; **Egelhofer**; **Lecheler**, 2019, p. 102).

Thus, to coin our own definition, for us disinformation is orchestrated dissemination of untruthful news or data through any type of communication channels, whether traditional –printed press, radio, television– or horizontal –social networks, etc.– with the intention of obtaining an economic, social, or strategic benefit, or of harming rivals, whether individuals, societies, institutions, or states.

By way of illustration, let us indicate the methodology that some of the most serious disinformation campaigns, aimed at destabilizing the targeted society, tend to follow. First, we proceed to the analysis and detection of social and political vulnerabilities of the victim entity. Second, transmedia narratives are developed, which will be disseminated through various communication chan-

> "Disinformation campaigns are already considered to be a true wrongful act whose execution generates the normal consequences attributable to other wrongful acts in international law"

nels. Third, their own media network is established, and finally, they proceed to create automated distribution channels (*Centro Criptológico Nacional*, 2019, pp. 17-19).

In contrast, "fake news" has a smaller quantitative scope than "disinformation" (**Rodríguez-Pérez**, 2019, p. 65); it is specific false news items, false or falsified messages, half-truths, and hoaxes, though consciously transmitted for economic, political, social, strategic, or other benefits, or to damage the reputation or image of an adversary or enemy.

For us, therefore, the difference between "fake news" and "disinformation" is in the numerical dimension –in the scale on which they are used. Thus, disinformation is carried out through campaigns of dissemination of false news or hoaxes, seeking, as Pilar Bernal warns,

> "[...] to shift the decision-making process and thus alter the perception of national and international publics and audiences" (**Bernal-Hernández**, 2021, p. 97).

This relationship and the quantitative difference are clearly seen, in my opinion, in Julio Montes' account of the contribution of the Russian television channel *RT* to the Russian strategic effort:

> "Their mission is not to misinform with occasional hoaxes on a recurring basis, as other 'fake' websites can do, but rather it is all part of a global and long-term action with a political objective. As the media weapon of Putin's government that they are, they have a propagandistic purpose behind them. They are an example of disinformation in a broader and more far-reaching sense: a mixture of realities, half-truths and rumors on issues that have direct stakes for Russia" (**Montes**, pp. 42-43).

Indeed, Julio Montes provides us with a real and practical example of a disinformation campaign, closely linked to the subject of this article: the use of the television channel *RT* to support Russian interests in their invasion of Ukraine in 2022. For Julio Montes, *RT*'s disinformative campaign in Spanish

> "[...] had begun before the first shot was fired. For months, Russia and its media outlets denied that there was a plan to invade Ukraine. It was all 'conspiracy theories'" (*ibid*. p. 42).

Thus, for this author, months before what was ultimately an invasion of the territory of neighboring Ukraine, the Russian "journalists" at *RT* in Spanish

> "[...] sought to discredit the content that warned of the approach of Russian troops to Ukraine and the information that warned of a possible invasion by Russia:
> 'Of course, January will come and then February and March, 2022 will end, and I'm sure in the media you'll still read that the invasion is imminent. Those who warn again and again of an imminence that never comes do not do so out of ignorance, but rather because they have calculated it perfectly'" (*ibid.*).

Montes also notes that, on February 20, a few days before the imminent invasion, *RT*, quoting the Russian government, spoke of the "myth of the invasion" (*ibid.*). However, Montes warns,

> "The day after the Russian attack, on Friday, February 25, *RT* spoke of 'an operation' to 'safeguard the security of millions of people living in Dombas.' Despite months of reports about this possible attack, the RT presenter said that 'it had been a surprise'" (*ibid.*).

Another example of disinformation in practice, in which Russia also played a starring role, was detected by the *UK Government*, which uncovered evidence of *TikTok* influencers being paid to amplify pro-Russian narratives following the 2022 invasion of Ukraine (*Organisation for Economic Co-operation and Development*, 2022, p. 3).

Finally, regarding the term "propaganda," we must also draw attention to its similarity to the term "disinformation." Indeed, as Alejandro Pizarroso-Quintero argues:

> "Propaganda, in the field of social communication, consists of a process of dissemination of ideas through multiple channels with the purpose of promoting in the target group the objectives of the sender not necessarily favorable to the receiver; it implies, then, a process of information and a process of persuasion" (**Pizarroso-Quintero**, 1991, p. 147).

Along these lines, Randal Marlin specifies that, in general, propaganda involves some kind of deception or prevents the audience from rationally and knowledgeably evaluating the message that the communicator wishes to convey (**Marlin**, 2014, pp. 191-92). Although there is no doubt that it had been used before, experts agree that it was used extensively during the First World War (**Bernal-Hernández**, 2021, p. 94). After this, a theory of propaganda was outlined for the first time (**Pizarroso-Quintero**, 1991, p. 151), probably based on the work of the American political scientist and sociologist Harold Dwight Lasswell *Propaganda Technique in the World War*, published in 1927, in which he prophetically warned of the importance of this tool for political purposes.

> "As an example of manipulation, Van-Dijk cites a speech given by then Prime Minister of the United Kingdom, Tony Blair, in March 2003 to obtain the *British Parliament*'s approval for the British armed forces' participation in the Iraq war"

In short, as can be seen, all these cases involve similar concepts, which have appeared at different times and have gained notoriety at certain moments, referring to the use of different communication tools to disseminate biased content for specific purposes, though for the purposes of this article, we emphasize the political or strategic purpose.

We would not want to close this section without noting the damage that these errors, now widespread, are producing in journalistic work (**Egelhofer**; **Lecheler**, 2019, p. 112), which as highlighted by Rodríguez-Pérez:

> "[...] consists of informing so that knowledge becomes flesh in society" (**Rodríguez-Pérez**, 2019, p. 67) .

In any case, we must point out that, in this paper, out of all the phenomena of communication disorders described, we will mainly talk about "disinformation" because it is the one that best represents the activities of media indoctrination carried out in an orchestrated manner by Russian government bodies to destabilize their rivals. Moreover, we will use the term "disinformation" in a generic way, without excessive concern for terminological precision, which would be impractical, in relation to the similar concepts we have just discussed, such as "fake news" or "propaganda." Methodological choice, on the other hand, is not unusual in official texts and documents –for example, in the *Joint Statement on Freedom of Expression and Fake News, Disinformation, and Propaganda* by the *UN* Special Rapporteur on Freedom of Opinion and Expression, the *Representative of the Organization for Security and Cooperation in Europe for Freedom of the Media*, the Special Rapporteur of the *Organization of American States for Freedom of Expression*, and the Special Rapporteur of the *African Commission on Human and Peoples' Rights for Freedom of Expression and Access to Information* (*United Nations Special Rapporteur on Freedom of Opinion and Expression et al.*, 2017).

3. Attribution to a state

Generally speaking, as we said in the introduction, we understand that the rules contained in the aforementioned *ILC* draft articles on the responsibility of states for internationally wrongful acts should be applied to cases of attribution of international responsibility to a particular state for using disinformation campaigns against other states or international organizations.

According to article 2 of the draft articles, one of the two basic conditions for establishing the international responsibility of a state is that the conduct in question is attributable to that state under international law. In this sense, the general rule is that the only conduct attributable to the state in the international sphere is that of its public, executive, legislative, or judicial bodies, at any level of the administration, or that of others acting under the direction or control or at the instigation of those bodies –that is, as agents of the state. In contrast, the conduct of private individuals or non-state entities cannot be attributed to the state under international law. However, article 8 of the draft provides that there may be circumstances in which such conduct may be attributable to the state because there is a specific factual relationship between the person or entity engaging in the conduct and the state. In fact, article 8, which reflects one of the rules of the draft that according to the *International Court of Justice* is considered common law (*International Court of Justice*, 2007a, p. 207, para. 398), provides that, according to international law, the following shall be considered an act of a state:

> "The conduct of a person or group of persons [...] if that person or that group of persons is in fact acting on the instructions of, or under the direction or control of, that State in carrying out the conduct."

As regards the specific problem of the conduct of state-owned or state-controlled corporations or enterprises, which is of particular interest to us when it comes to shedding light on the situation of the media, the *ILC* commentary to the draft articles notes that the fact that the state originally created a corporation, whether by special law or otherwise, does not constitute a sufficient basis for attributing the subsequent conduct of that entity to the state (*International Law Commission*, 2001, p. 50). For the *ILC*, corporations,

> "[...] although owned and in that sense subject to the control of the State, are considered to be separate, *prima facie* their conduct in carrying out their activities is not attributable to the State unless they are exercising elements of governmental authority within the meaning of article 5" (*ibid.*)

That is to say, if they are empowered by the law of that state to exercise the attributions of powers of the public authority (*ibid.*, p. 44).

Moving these rules into the arena of disinformation campaigns, we understand that those orchestrated by media or entities that, de facto, acted on the instructions or under the direction or control of the state concerned when such conduct is observed would be attributable to the state concerned, whether or not such entities are state-owned. In this regard, the *Tallinn Manual on the International Law Applicable to Cyber Warfare* warns, for example, that,

> "[...] States may contract with a private company to conduct cyber operations. Similarly, States have reportedly called upon private citizens to conduct cyber operations against other States or targets abroad (in a sense, 'cyber volunteers')" (**Schmitt**, 2013, p. 32).

For the authors of this work, these situations must be distinguished from those in which certain citizens ("hacktivists" or "patriotic hackers"), on their own initiative, carry out cyber operations (*ibid.*, p. 33).

This would be the theory, but in reality, attributing disinformation campaigns to a state is difficult (**Dawson**; **Innes**, 2019, p. 253; **Lehmann**, 2022) because it is technically possible to distribute information on the Internet without leaving tra-

ces of its origin, and because sometimes several entities are used at the same time to spread the information, thus responsibility becomes less clear. For example, in the case of the Russian state, one can demonstrate close connections between the state and media outlets such as *Russia Today* (*RT*) and *Sputnik*, which appear to be funded by the Russian government (**Baade**, 2018, p. 1361). However, this would most likely not be enough for their actions to be attributable to the Russian state; it would be necessary to prove that the state is de facto directing their actions when they orchestrate disinformation campaigns. By way of illustration, let us note that Björnstjern Baade, the editor-in-chief of *Russia Today*, being one of the 300 journalists decorated by Vladimir Putin for the news coverage of the conflict in Crimea would not be sufficient to attribute the news that appeared in that media outlet to the Russian state (**Baade**, 2018, p. 1362).

> "Disinformation is orchestrated dissemination of untruthful news or data through any type of communication channels, whether traditional –printed press, radio, television– or horizontal –social networks, etc.– with the intention of obtaining an economic, social, or strategic benefit, or of harming rivals, whether individuals, societies, institutions, or states"

In the same vein, in the report *Doppelganger: Media Clones Serving Russian Propaganda*, published in September 2022 and created by researchers from the *EU DisinfoLab* platform –an independent non-governmental organization (NGO) focused on researching and fighting disinformation campaigns targeting the EU, its member states, its core institutions, and its fundamental values– after having stated that a disinformation campaign of which many elements pointed to the involvement of Russian-based actors had been uncovered, it ultimately warned that the research developed

> "[...] does not lead to a formal attribution to a specific actor." (**Alaphilippe** *et al*., 2022).

By way of illustration, it should be noted that, among these elements pointing to a Russian origin, it was specified that, in terms of infrastructure, the spoofed domain names were operated by the same actor, and some of these domains were purchased through the Russian Internet registrar. The fake videos were produced by computers with a Russian configuration, etc. (*ibid.*).

On the contrary, in some official documents of the states, such as some of those of the *US Senate*, certain disinformation campaigns carried out through certain Russian media outlets are attributed to the Russian state, so the leap has already been made. Indeed, according to the findings of the report *Russian Active Measure Campaigns and Interference in the 2016 US Election* prepared by the *United States Senate Select Committee on Intelligence* to investigate Russian intervention in the 2016 American election:

> "In 2016, Russian operatives associated with the St. Petersburg-based *Internet Research Agency* (*IRA*) used social media to conduct an information warfare campaign designed to spread disinformation and societal division in the United States" (*United States Senate*, 2020), vol. II, p. 73).

For the *Committee*, the *Russian Government*

> "[...] tasked and supported the *IRA*'s interference in the 2016 U.S. election" (*ibid*. p. 75),

and moreover, that data is consistent with the relationship evident to the *Committee* between *IRA* owner Yevgeniv Prigozhin and the *Kremlin*. Thus, despite Moscow's denials,

> "the direction and financial involvement of Russian oligarch Yevgeniy Prigozhin, as well as his close ties to high-level Russian government officials including President Vladimir Putin, point to significant *Kremlin* support, authorization, and direction of the *IRA*'s operations and goals" (*ibid.*).

In addition, we can see how, increasingly and more clearly, EU institutions are pointing the finger at certain foreign states when it comes to pinpointing the responsibility for disinformation campaigns perpetrated against the EU itself or against member states. For example, as already highlighted in the introduction to this article, on September 24, 2021, in his declaration, on behalf of the EU, on respect for democratic processes in the EU, the *EU High Representative for Foreign Affairs and Security Policy*, Josep Borrell, stated that some member states had observed malicious computer activities, collectively referred to as "ghostwriting," that endangered integrity and security, and they had been linked to the Russian state (*Council of the European Union*, 2021).

Likewise, the *Report on Foreign Interference in All Democratic Processes in the European Union, Including Disinformation* (2020/2268(INI)), by the *European Parliament's Special Committee on Foreign Interference in All Democratic Processes in the European Union*, including Disinformation, unequivocally warned that:

> "[...] evidence shows that malicious and authoritarian foreign state and non-state actors, such as Russia, China and others, use information manipulation and other interference tactics to interfere in democratic processes in the EU" (*European Parliament*, 2022a, D).

It openly added that these attacks are part of a hybrid war strategy and represent a violation of international law (*ibid*). With that report in mind, a few weeks later the *European Parliament* adopted a resolution –*European Parliament Resolution of 9 March 2022 on Foreign Interference in All Democratic Processes in the European Union, Including Disinfor-*

mation (2020/2268(INI))– in which, after reiterating the statements contained in the aforementioned report (*European Parliament*, 2022b, E), it states even more strongly that:

> "[...] Russia has been engaging in disinformation of an unparalleled malice and magnitude across both traditional media outlets and social media platforms, in order to deceive its citizens at home and the international community on the eve of and during its war of aggression against Ukraine, which Russia started on 24 February 2022, proving that even information can be weaponised" (*European Parliament*, 2022b, C).

In the same line of blunt accusation, we bring up the joint statement of EU and US Ambassadors to Bosnia and Herzegovina from June 6, 2022. In it, shortly before the Russian ambassador addressed the Bosnian parliament, he warned, that, with respect to the Ukrainian conflict, the deputies were going to hear disinformation about the brutal invasion of Ukraine. To cite an example, it stated:

> "[...] You are likely to hear that Russia is protecting people from Nazism. These are outrageous lies. Moscow seeks to exploit the cultural and religious bonds that Russia shares with the Serb people to divert your attention from its crimes in Ukraine." (*European External Action Service*, 2022).

4. Violation of an international obligation

As in the previous section, following the rules of the *ILC* draft articles on *International Responsibility of States for Internationally Wrongful Acts*, after the analysis of whether it is possible to attribute certain disinformation campaigns to the Russian state, we will study the handling in international practice of Russia's possible violations of international obligations in this section.

Thus, we should note that, in the more or less thinly veiled accusations presented above that both private and official actors from states or international organizations have made against Russia, three types of international obligations allegedly violated by disinformation campaigns were indicated: interference in domestic affairs, violation of human rights, and security threats.

However, we should point out now that accusations of Russia being behind certain disinformation campaigns were usually accompanied by the accusation of having carried out cyberattacks against the states or international organizations in question. This is logical since, if the objective of the "aggressor" state is to destabilize and damage the "victim" state or international organization, in particular, as we shall see, in its internal democratic functioning, it will normally seek to achieve this end by various means simultaneously.

4.1. Interference in domestic affairs

As the *International Court of Justice* made clear in the *Nicaragua* case in 1986:

> "The principle of non-intervention involves the right of every sovereign State to conduct its affairs without outside interference; although examples of trespass against this principle are not infrequent, the Court considers that it is part and parcel of customary international law" (*International Court of Justice*, 1986, p. 106, para. 202).

This confirmed that the prohibition against intervening in the domestic affairs of states was compulsory not just for the *United Nations* organization, as prescribed in article 2.7 of the *San Francisco Charter*, but rather for all states. In that landmark ruling, the *International Court of Justice* also addressed the substance of this principle, stating that it prohibits those interventions related to matters on which each state may, by virtue of its sovereignty, freely decide, and specified, among other issues, the freedom to choose a political, economic, social, and cultural system, as well as the formulation of its foreign policy (*International Court of Justice*, 1986, p. 108, para. 205). The *Court* added to these considerations that:

> "[...] Intervention is wrongful when it uses methods of coercion in regard to such choices, which must remain free ones. The element of coercion, which defines, and indeed forms the very essence of, prohibited intervention, is particularly obvious in the case of an intervention which uses force, either in the direct form of military action, or in the indirect form of support for subversive or terrorist armed activities within another State" (*ibid.*).

Let us recall that, in its *Resolution 2131 on December 21, 1965*, entitled "Declaration on the Inadmissibility of Intervention in the Domestic Affairs of States and Protection of Their Independence and Sovereignty," the *United Nations General Assembly* had already indicated that could be considered violations of that principle

> "[...] armed intervention and all other forms of interference or attempted threats against the personality of the State or against its political, economic and cultural elements, [...]" (*Organization of the United Nations*, 1965).

In the context of this article, a disinformation campaign carried out by a state with the intention of destabilizing another state or an international organization must be considered an act of intervention in the domestic affairs of another state. Of course, if this were accompanied by other hostile elements, such as cyberattacks or the threat or use of force, that would increase its seriousness and, in such a case, the international responsibility of the state. Let us examine whether there have been actual cases in which specific disinformation campaigns have been considered acts of intervention in domestic affairs and how they have been dealt with.

In the *European Parliament Resolution of 9 March 2022* on foreign interference in all democratic processes in the European Union, including disinformation [*2020/2268(INI)*] –which we commented on previously mentioning the *Charter*

of the United Nations, in particular articles 1 and 2, and *Resolution 2131 (XX) of the United Nations General Assembly*, which condemns not only armed intervention but also any other form of interference or attempted threat against the personality of the state or against its political, economic, and cultural elements– information manipulation, of which Russia and China were accused, was considered a form of interference (*European Parliament*, 2022b, A and E).

> A disinformation campaign carried out by a state with the intention of destabilizing another state or an international organization must be considered an act of intervention in the domestic affairs of another state

Likewise, the aforementioned report *Russian Active Measure Campaigns and Interference in the 2016 US Election*, prepared by the *US Senate Select Committee on Intelligence*, argued that Russia's actions during the 2016 US presidential election were part of a broad, sophisticated, and long-standing campaign of information warfare designed to sow discord in American politics and society. In fact, for the *Committee*:

> "The IRA's actions in 2016 represent only the latest installment in an increasingly brazen interference by the Kremlin on the citizens and democratic institutions of the United States" (*United States Senate*, 2020), vol. II, p. 75).

4.2. Violation of human rights

The transmission or circulation of false information is an action that is closely related to the fundamental right to freedom of information and expression in any democracy. And this is a double-edged sword. On the one hand, freedom of expression and information guarantees that individuals or institutions can freely broadcast the information they wish, with limitations in exceptional cases. On the other hand, the transmission of false information at certain levels, for example, reaching the point of a disinformation campaign, can amount to a major violation of one of the core elements of a developed society's democratic functioning. In this regard, it is worth citing the case law of the *European Court of Human Rights* (*ECtHR*), which has reaffirmed that

> "Freedom of expression [is] one of the essential foundations of a democratic society and one of the basic conditions for its progress" (*ECtHR,* 1992, *Castells v*. *Spain*, para. 42).

At the European level, for example, this freedom is part of the fundamental rules of the Union. Thus, article 2 of the *Treaty on European Union* (*TEU*) establishes that democracy is one of the fundamental values of the Union, and it is based on the existence of free and independent media, the functioning of which requires full exercise of freedom of expression and information. This freedom is in turn guaranteed by article 11 of the *Charter of Fundamental Rights of the European Union*. According to its text, freedom of expression and information includes freedom of opinion and the freedom to receive or impart information or ideas without interference by public authorities and regardless of frontiers, as well as freedom of the media and its pluralism. In addition, article 10 of the *European Convention on Human Rights* (*ECHR*), which is also part of the EU legal system, recognizes the right to freedom of expression. According to its literal wording:

> "[...] This right shall include freedom to hold opinions and to receive and impart information and ideas without interference by public authority and regardless of frontiers."

However, the text of the provision clarifies that its scope does not prevent states from requiring the licensing of radio, film, or television broadcasting enterprises first. In fact, the exercise of these freedoms, which carries with it duties and responsibilities, may be subject to such formalities, conditions, restrictions, or sanctions as are prescribed by the law of the states, provided that they constitute necessary measures to protect essential values in democratic societies. Among these values, the article lists:

> "[...] national security, territorial integrity or public safety, for the prevention of disorder or crime, for the protection of health or morals, for the protection of the reputation or rights of others, for preventing the disclosure of information received in confidence, or for maintaining the authority and impartiality of the judiciary."

For these reasons, European case law, of both the *Court of Justice of the European Union* (*CJEU*) and the *ECtHR*, when interpreting and applying the aforementioned right to information and expression, has reiterated that any limitation on freedom of expression must be interpreted restrictively, and any limitation must be imposed by normative provisions (*CJEU*, 2001, *Connolly v. European Commission*, para. 42). Primarily, the fact that the *CJEU* has warned that authorities cannot silence opinions, even if they run contrary to the official view, is noteworthy for the purposes of this article (*CJEU,* 2001, *Connolly v. European Commission*, para. 43). For the *ECtHR*, even article 10 of the *ECHR*

> "[...] does not prohibit discussion or dissemination of information received even if it is strongly suspected that this information might not be truthful. To suggest otherwise would deprive persons of the right to express their views and opinions about statements made in the mass media and would thus place an unreasonable restriction on the freedom of expression set forth in Article 10 of the *Convention*." (*ECtHR,* 2005, *Salov v. Ukraine*, para. 103).

Regarding the aforementioned double-edged sword, the *European Parliament* has referred to the information manipulation and disinformation in its *Resolution of 9 March 2022* on foreign interference in all democratic processes of the European Union, including disinformation, which we commented upon previously. Indeed, the *Parliament* noted, on the one hand, that

> "[...] foreign interference, information manipulation and disinformation are an abuse of the fundamental freedoms of expression and information as laid down in Article 11 of the *Charter* and threaten these freedoms [...]" (*European Parliament*, 2022b, B).

And, on the other hand, it warned that

> "[...] any action against foreign interference and information manipulation must itself respect the fundamental freedoms of expression and information" (*ibid.*, C).

In the same vein, an official document of the *Office of the Representative on Freedom of the Media* of the *Organization for Security and Co-operation in Europe* (*OSCE*) has referred to the dilemma of the right to freedom of expression/fight against disinformation, for whom,

> "[...] no 'ministries of truth' should be established to verify accuracy, current and past debates point to the duty of everyone, including public authorities, to facilitate dissemination of truthful information" (*Organization for Security and Cooperation in Europe*, 2021, para. 7).

In addition to being seen in the European legal context, this same double-edged sword of false information and disinformation campaigns as opposed to the right to freedom of expression and information is reflected universally. Thus, the *Human Rights Committee*, which is the body of independent experts that monitors the implementation of the *International Covenant on Civil and Political Rights* by its member states, has pointed out that the right to freedom of expression is broad in that it covers even expressions that may be considered deeply offensive –something that the *ECtHR* had also pointed out in its case law (*Human Rights Committee*, 2011, para. 11; *TEDH,* 1976, *Handyside v. United Kingdom*, para. 49).

The same idea is found in the *Joint Declaration on Freedom of Expression and "Fake News," Disinformation and Propaganda* of the *United Nations Special Rapporteur on Freedom of Opinion and Expression*, and other international authorities, previously mentioned; it is emphasized that:

> "[...] the human right to impart information and ideas is not limited to 'correct' statements, that the right also protects information and ideas that may shock, offend and disturb, and that prohibitions on disinformation may violate international human rights standards, while, at the same time, this does not justify the dissemination of knowingly or recklessly false statements by official or State actors" (*United Nations Special Rapporteur on Freedom of Opinion and Expression et al.*, 2017).

The research report of the *Broadband Commission*, established by the *International Telecommunication Union* (*ITU*) and the *United Nations Educational, Scientific, and Cultural Organization* (*Unesco*), also expresses a similar view about the freedom of expression and the fight against disinformation on the Internet. According to the report:

> "Under human rights law, expression of false content –like other expression– is protected, with some exceptions. For example, under the *International Covenant on Civil and Political Rights*, certain forms of hate speech, incitement to violence, and speech that threatens human life (including dangerous health disinformation) can attract legitimate restrictions for reasons such as the protection of other human rights, or for public health purposes." (*International Telecommunication Union* and *United Nations Educational, Scientific, and Cultural Organization*, 2020).

But, as this report also highlights:

> "Nevertheless, inasmuch as speech does not reach this threshold of legitimate restriction, people have a right to express ill-founded opinions and make non-factual and unsubstantiated statements" (*ibid.*).

We may summarize this point by noting that, according to international legal standards and the practice of human rights protection bodies, as evidenced by the abovementioned document of the *Office of the OSCE Representative on Freedom of the Media*, limitations to the right to freedom of expression are permissible as long as they do not jeopardize the right itself and meet certain conditions, namely:

(1) they are prescribed by law in a sufficiently clear and precise manner;

(2) they pursue a legitimate aim, such as those enumerated in paragraph 3 of article 19 of the *International Covenant on Civil and Political Rights*, namely the protection "of the rights or reputations of others" and "the protection of national security or of public order (ordre public), or of public health or morals"; and

(3) they meet "strict tests of necessity and proportionality" (*Organization for Security and Co-operation in Europe*, 2021, para. 15).

Finally, we would like to note that, recently, in the context of the conflict in Ukraine, the *UN Human Rights Council*, in a *Resolution of 4 March 2022*, in which it examined the human rights situation in Ukraine stemming from the Russian aggression, exposed that disinformation could be one tool, among others, used to violate human rights. Specifically, the *UN Human Rights Council* expressed its concern

> "[...] at the spread of disinformation, which can be designed and implemented so as to mislead and to violate and to abuse human rights, including privacy and the freedom of individuals to seek, receive and impart information" (*United Nations*. *Human Rights Council*, 2022).

4.3. Security threat

In the end, as noted previously, certain disinformation campaigns could perhaps be qualified as real threats to the security of states or international organizations, either in and of themselves or in conjunction with other elements of the so-called hybrid threats or wars. In relation to this concept of "hybrid war" so trendy today, it seems that, as stated by **Colom-Piella** (2019, pp. 7-8), it was first used informally in an academic paper from the *US Navy* in 2002 (**Nemeth**, 2002) to refer to the tactics employed by the Chechen insurgency against the Russian forces during the First Chechen War (1994–1996), and shortly thereafter in an official US military document to explain the combination of two or more conventional threats with more disruptive ones (*United States of America Department of Defense*, 2005). For the purposes of this article, we could therefore summarize this concept, in the words of a *European External Action Service* document, as the combination of conventional and non-conventional military and non-military activities that can be employed by both state and non-state actors to achieve specific policy objectives. Among these activities, cyberattacks on critical information systems, undermining public trust in public institutions, and deepening social divisions are specifically noted in that document (*European External Action Service*, 2018). Naturally, as Colom Piella has also shown, most of these threats are not new in international society, nor are the tactics, techniques, and procedures they employ to achieve their objectives. What is new in the 21st century is the harmfulness of these threats, which comes from the exploitation of technology to maximize the informational impact in the new setting of cyberspace (**Colom-Piella**, 2019, p. 14).

Moving on to the implementation in international society to determine whether international organizations and states have considered disinformation campaigns to be threats to international security, we see that there is no shortage of official documents stating this.

Other international actors include, for example, *NATO*. In fact, the *June 2021 Brussels Summit Communiqué*, issued by the heads of state and government participating in the *North Atlantic Council* meeting in Brussels on June 14, 2021, stated that the *Alliance* is determined to employ its full range of capabilities at all times

> "[...] to actively deter, defend against, and counter the full spectrum of cyber threats, including those conducted as part of hybrid campaigns, in accordance with international law." (*North Atlantic Treaty Organization*, 2021, para. 32).

Along with this, the aforementioned document adds that the allies reaffirmed that a decision as to whether a cyberattack could lead to the invocation of article 5 of the *Treaty* should be made by the *North Atlantic Council* on a case-by-case basis, and that the impact of cumulative malicious cyber activities may, in certain circumstances, be considered tantamount to an armed attack (*ibid.*). The statement is relevant for the purposes that concern us in this article because, although it is not argued that disinformation campaigns can in certain circumstances be viewed as cyberattacks, it is not ruled out either.

Moreover, a few months later, in the *NATO Strategic Concept* adopted by the heads of state and government at the Madrid Summit of June 29, 2022, it was argued that certain authoritarian actors seek to jeopardize the interests, values, and democratic way of life of the allies, as well as undermine multilateral norms and institutions and promote authoritarian models of governance, using disinformation campaigns and other hybrid tactics. In the words of the aforementioned *NATO* instrument, referring to these authoritarian actors:

> "They interfere in our democratic processes and institutions and target the security of our citizens through hybrid tactics, both directly and through proxies. They conduct malicious activities in cyberspace and space, promote disinformation campaigns, instrumentalise migration, manipulate energy supplies and employ economic coercion. [...]" (*North Atlantic Treaty Organization*, 2022, para. 7).

The *European Parliament* has also taken the leap of considering certain disinformation campaigns to be security threats in its *Resolution of 9 March 2022* on foreign interference in all democratic processes in the European Union, including disinformation, pointing, as we know, directly to Russia and China, among others. Indeed, the *European Parliament* considered the aforementioned acts of information manipulation and other tactics of interference in democratic processes in the EU to be part of a "hybrid war strategy" and, among other things, the European Parliament ended by pointing out that they

> "[...] constitute a serious threat to EU security and sovereignty" (*European Parliament*, 2022b).

The *Council of the European Union*, for its part, has also made the connection between disinformation campaigns and jeopardizing security. Thus, the important security tool called the *Strategic Compass for Security and Defense* clearly demonstrates that Russia is threatening European order when it comes to the security and the safety of European citizens, not only through armed aggression but also through the use of "information manipulation campaigns" (*Council of the European Union*, 2022, p. 7).

In parallel to international organizations, states have considered disinformation campaigns to be threats to their security. Russia itself, in a document entitled "Russian Federation Armed Forces' Information Space Activities Concept," published on the website of the *Ministry of*

> "The impact of cumulative malicious cyber activities may, in certain circumstances, be considered tantamount to an armed attack"

Defense of the Russian Federation, recognizes that the rapid development of computer systems and electronic mass media in the third millennium has led to the creation of "a new global information space," going so far as to point out that:

> "Along with the land, sea, air and outer space, the information space has been extensively used for a wide range of military tasks in the armies of the most developed countries" (*Ministry of Defense* of the Russian Federation).

As we can see, the Russian *Ministry of Defense* considers the actions carried out in the new global information space to be one more military activity of the most developed countries. Said document even argues that, owing to the fact that information and communications systems are vulnerable to radio-electronic, software, and hardware strikes –once upon a time novel but now increasingly ubiquitous– information weapons have cross-border effects. Thus, the document concludes that:

> "[...] The role of the information warfare has sharply increased" (*ibid.*).

Similarly, *Spain's 2021 National Security Strategy* warns bluntly that

> "Disinformation campaigns have a clear impact on national security", though it does not single out Russia specifically, of course (*Government of Spain*, 2021).

The *UK's 2022 National Cyber Strategy* also deems disinformation campaigns to be a threat to national security, in conjunction with other forms of cyberattacks, also not referencing Russia specifically. In fact, according to this *British Government* document:

> "[...] Cyber attacks against the UK are conducted by an expanding range of state actors, criminal groups (sometimes acting at the direction of states or with their implicit approval) and activists for the purpose of espionage, commercial gain, sabotage and disinformation [...]" (*United Kingdom Government*, 2022, p. 9).

We will limit ourselves to citing one more example in this same line, which has been pursued by other states, as it is particularly important due to the military and geopolitical significance of the writer. We refer to the *US National Security Strategy* of October 2022, which states that

> "[...] we are responding to the ever-evolving ways in which authoritarians seek to subvert the global order, notably by weaponizing information to undermine democracies and polarize societies." (*United States of America*, 2022, pp. 17-18).

5. The question of reparations

As is well known from the rules of the legal system of international responsibility of states for internationally wrongful acts, from the moment a state commits an internationally wrongful act, a new legal relationship arises –the relationship of international responsibility– which results in the genesis of new obligations, in particular, the obligation to make reparations for the harmful effects arising from that act (article 28 of the 2001 *ILC draft*).

Let us recall that the first two obligations imposed on states responsible for having carried out an internationally wrongful act are the cessation and non-repetition of the wrongful conduct (article 30 of the 2001 *ILC draft*). Thus, first, the "cessation" of conduct that goes against the international obligation is the first step that must be taken by any state responsible for an internationally wrongful act, assuming that it is continuing. Second, and if the circumstances so require, the responsible state must provide

> "appropriate assurances and guarantees that it will not engage in such unlawful conduct again".

Examples of guarantees of non-repetition include the adoption of preventive measures by the offending state to avoid a new violation or a public and formal declaration by the responsible state that such acts will not be repeated in the future.

Furthermore, as we have already noted, in addition to these two obligations of cessation and of providing guarantees of non-repetition, the state responsible for having committed an internationally wrongful act must seek to eliminate all the consequences generated by that act and to restore the situation that would have existed had it not been committed. To this end, it must comply with this new and successive obligation to make full reparation for the harm caused, taking into account that such harm includes any damage, both material and moral, resulting from the wrongful conduct (article 31 of the 2001 *ILC Draft*). There are three main forms of reparation for the harm caused: restitution, compensation, and apology (article 34 of the 2001 *ILC Draft*). All of them, alone or in combination, enable the offending state to comply with the obligation to make full reparation for the harm caused.

After this brief theoretical introduction to the legal system of liability in terms of the obligation to make reparation, we should note that, in the context that concerns us in this article –that of disinformation campaigns or the dissemination of false news– the recognition of falsehood and its rectification, as forms of restitution and satisfaction, have been put forward as a possible form of reparation, under articles 35 and 37 of the 2001 *ILC draft articles* (**Baade**, 2018, p. 1369). In addition, we believe that a correct way to make reparations could be to compensate economically for the damage caused by disinformation campaigns, in parallel to or as a substitute for campaigns to rectify false information; of course, such reparation would be linked to some form of voluntary acknowledgment of responsibility or to a determination of responsibility through some means of peaceful settlement of international disputes. However, for the time being, there are no known cases in which an international dispute arising from a disinformation campaign has been submitted to any of these means of peaceful settlement, whether judicial or non-judicial.

> We have focused on Russia because it has become apparent not only to specialized researchers but to all citizens through the mainstream media that Russia has used disinformation campaigns to cloak its invasion of Ukraine in a smoke cloud of lies and half-truths

Regarding the scope of the jurisdiction of the *International Court of Justice*, we must proceed by saying that states have not yet accused each other of having used disinformation campaigns as a possible way of violating of an international obligation before it; one of these means of peaceful settlement, it is particularly interesting for our purposes because it is the principal judicial body of the *UN* and because of its track record of contributing to the determination and interpretation of international law. As no accusations have been made, no international responsibility has been attributed either. In fact, disinformation campaigns have rarely been referred to in the case law of the *Court*, except in some documents provided by the parties in support of their arguments, but in a very collateral way. One of these rare occasions was the case of *Ahmadou Sadio Diallo* (*Republic of Guinea v. Democratic Republic of Congo*) in which Guinea, in exercising diplomatic protection of one of its nationals, accused the Congo of violating the human rights of Mr. Sadio Diallo by the manner in which he was arrested, imprisoned, and then expelled, and by the manner in which his property was endangered. But Guinea did not reproach the Congo for using the weapon of disinformation. On the contrary, it was the defendant, the Democratic Republic of Congo, who invoked it, to provide proof that Mr. Sadio Diallo had been imprisoned for having carried out, among other things, disinformation campaigns against authorities or pre-eminent figures of the Democratic Republic of Congo and of other states (*International Court of Justice*, 2007b, p. 593, para. 19).

Indeed, a case of enormous interest from international practice in which one state accused another, namely Russia, of using disinformation campaigns against its interests and then held it internationally accountable is that of the Russian intervention in the 2016 US elections, already discussed in other sections.

In fact, as we have already seen, in the report *Russian Active Measure Campaigns and Interference in the 2016 U.S. Election* prepared by the *U.S. Senate Select Committee on Intelligence* to investigate Russian intervention in the 2016 US elections, purported evidence was presented that Russia had, along with other forms of cyberattacks, used disinformation campaigns on the networks to alter the results of the 2016 American elections. In fact, according to the results of the investigation of the *US Senate Select Committee on Intelligence*, certain senior officials of the *US Government* were aware of Russian attempts to intervene in the 2016 elections before they were held. A few weeks before the elections took place in November 2016, President Obama's administration even warned Moscow on several occasions; however, its response did not go further for several reasons: the fear that the reaction of the Democratic administration might appear partisan; not provoking other Russian actions; or the limited response options available at the time (*United States Senate*, 2020, vol. III, p. 159). It appears that warnings to Moscow were made at various levels, but on one occasion, President Obama himself reproached Russian President Vladimir Putin in person for such Russian interventions during the *G20* summit in Hangzhou, People's Republic of China, on September 5, 2016 (*United States Senate*, 2020, vol. III, p. 181). In the aftermath of the November 2016 elections, the Obama administration now decided to take action against Moscow in response to its interference in the elections, for example, by proceeding with sanctions against Russian individuals or companies, the expulsion of Russian government personnel, and the closure of certain Russian diplomatic properties on US territory (*ibid.*, pp. 181, 194-195).

We must conclude our discussion of this matter of practice by noting that Russia has never acknowledged its responsibility for the acts alleged by the United States and that, for the time being, the United States has not raised the issue to the level of peacefully settling international disputes, beyond the few talks or negotiations that may have taken place in this regard. As seen, the United States, in its conviction that Russia had interfered in its 2016 elections, and thus committed an international wrongdoing, resorted to self-defense, that is, countermeasures, by expelling Russian diplomats from its territory.

Another possible example of a demand for international responsibility in the scope of disinformation campaigns that Russia carried out is certain cyberattacks and the use of disinformation against democracy in the EU. On September 24, 2021, the *EU High Representative for Foreign Affairs and Security Policy*, in his *Declaration* on behalf of the European Union about the respect of democratic processes in the EU (mentioned previously) pointed to the Russian State as the party responsible for the malicious computer activities collectively called "ghostwriting"; then, he stated that the EU and its member states strongly denounced these malicious computer activities, and required that all parties involved put an immediate end to them. Finally, he announced that the EU

> "[...] will return to this issue at future meetings and will consider the possibility of adopting additional measures" (*Council of the European Union*, 2021).

As shown, here we can see a scenario of a relationship of international responsibility under the regime outlined in the *ILC* draft articles, in which we find an accusation of wrongful acts, a request for cessation of the wrongful acts, and, perhaps in the future, the demand for some other form of reparation.

We end this section by pointing out that the EU have already adopted real sanctions against Russia after the invasion of Ukraine for the use of disinformation campaigns, namely, as the President of the *European Commission* warned:

> "[...] in another unprecedented step, we will ban in the EU the Kremlin's media machine. The state-owned *Russia Today* and *Sputnik*, as well as their subsidiaries will no longer be able to spread their lies to justify Putin's war and to sow division in our Union. So we are developing tools to ban their toxic and harmful disinformation in Europe" (*European Commission*, 2022).

6. Conclusions

In this paper, we have chosen to study Russia's international responsibility for having carried out disinformation campaigns; our purpose has been to assess the importance and progress that the use of disinformation campaigns have obtained in contemporary international society as a geopolitical weapon, much like other well-established means, such as the use of force.

Following the legal system's basic rules regarding the international responsibility of parties in international society – today technically codified, among other instruments, in the 2001 *ILC draft articles on International Responsibility of States for Internationally Wrongful Acts*– we had to investigate whether the accusations against Russia were, first, that they were the perpetrator outright or behind the curtain of certain disinformation campaigns. Second, we continued by examining of these accusations or attributions of responsibility, which also has enabled us to find out what type of international obligations or norms were alleged to have been violated by Russia in using these campaigns. Third, if the conjunction of both these elements, subjective and objective, is found, this analysis would allow us to be able to affirm that a given party has committed an international wrongful act, and thus to study the cases that involve the genesis of a new legal relationship –the relationship of international responsibility, in which new legal obligations arise, such as the cessation of the violation, the obligation to provide guarantees of non-repetition, and finally the obligation to make reparations for the damage caused, through appropriate material restitution, when possible, or by means of economic compensation and/or apology.

We have focused on Russia because it has become apparent not only to specialized researchers but to all citizens through the mainstream media that Russia has used disinformation campaigns to cloak its invasion of Ukraine in a smoke cloud of lies and half-truths. This would ensure an example in which we could assess the reaction that the other actors and parties of international society had to disinformation campaigns, from those that do not cause too much verifiable damage to the victim society to those that are accompanied by hostile actions or the blatant use of armed force, which, by their very nature, are more likely to cause significant damage to the affected society.

We have seen throughout these pages how accusations from states, international organizations such as the *CE* and *NATO*, and various scientific organizations and NGOs specializing in security against Russia for making use of disinformation campaigns are becoming widespread.

Together with accusations aimed directly at Russia, something that various entities have done for many years in a more or less thinly veiled manner, in recent years we have seen how other international actors have been accusing Russia, with increasing specificity, of violating certain international norms or obligations, such as the prohibition of interfering in domestic affairs; certain human rights, such as freedom of expression and information; and the prohibition of threats to the security of states or international organizations. In particular, the United States and the EU have accused Russia of having interfered in the 2016 US election and other EU member states' elections, violating the prohibition of interfering in the domestic affairs of states and, along with it, the fundamental rights of expression and information of US and European citizens. Following the invasion of Ukraine, these accusations have been joined by others linked to this conflict, such as that of the *UN Human Rights Council*, which, in the *Resolution of 4 March 2022*, accused Russia of violating certain human rights such as the right to privacy and the freedom of individuals to seek, receive, and impart information. In addition, both *NATO* and the *CE*, through various institutions and bodies, have accused Russia of threatening their security and that of their member states by carrying out disinformation campaigns.

Finally, we are beginning to find cases in which international responsibility has been attributed to the Russian state, as in the case of Russian interference in the 2016 US elections or Russian interference in the elections of certain European states, or the use of disinformation campaigns to cover up the invasion of Ukraine. And in some of these cases, the parties who are victims of disinformation campaigns or, in the case of the invasion of Ukraine, the international parties helping it to exercise its legitimate defense, have even sanctioned the Russian state already. The US administration has sanctioned Russia in this way, for example, by expelling Russian diplomats after its interference in the 2016 US elections, and the EU has banned *Kremlin*-friendly media outlets, as announced by the President of the *European Commission*, Ursula von der Leyen, after the 2022 invasion of Ukraine.

> "Scientific entities or NGOs specialized in security or other related matters are usually reluctant to make formal accusations against Russia, even if they have found solid evidence to indicate it, most probably to avoid retaliation or allegations against them from the Russian state or the perpetrators or agents involved in these disinformation campaigns"

Thus, we find that, in the case of the Russian disinformation campaigns, the full circle of the accountability relationship has been completed. The Russian state has been accused of or blamed for carrying out these disinformation campaigns. The violation of certain international obligations has been shown, and it has been held accountable or even sanctioned for this. We have been able to verify that, in contrast, scientific entities or NGOs specialized in security or other related matters are usually reluctant to make formal accusations against Russia, even if they have found solid evidence to indicate it, most probably to avoid retaliation or allegations against them from the Russian state or the perpetrators or agents involved in these disinformation campaigns.

In light of these findings, it can be concluded that disinformation campaigns have gained significant importance as a tool of geopolitics or international relations, either on their own or in conjunction with other more classic weapons in international society, such as the age-old use of force or, effectively the same, war. In addition, I believe that this article can contribute to tipping the balance in the doctrinal debate (mentioned in the introduction) between those who think that disinformation campaigns do not greatly influence international relations and those who, on the contrary, assert that they do. In addition, because it was not the subject of this article, we could not address the question of whether disinformation campaigns contribute to modifying what the population thinks individually or collectively, which is another aspect of this debate among experts regarding the scope of disinformation campaigns; however, we believe that, indirectly, our article also proves the "usefulness" of these tools or "weapons" since, in my opinion, if states already place so much importance on disinformation campaigns, and even demand international responsibility when they are used, then these types of campaigns must have a great deal of influence on what their nationals may think.

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Perception and opinion of the Ukrainian population regarding information manipulation: A field study on disinformation in the Ukrainian war

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Abstract

The war unleashed following the Russian invasion of the Ukrainian territory has provided an avalanche of information regarding military and strategic events, information which has conditioned policy making as well as the development of the current world order. Like any armed conflict, war not only takes place in the trenches and on the battlefields, but the weaponization of elements of disinformation and propaganda towards the general population and nation states can influence the outcome of the conflict as well. These elements might become powerful weapons that partly condition future events. This field study and research, carried out across Ukrainian territory, explores the perception by the Ukrainian people of information manipulation, taking into consideration different population groups. It should be noted that Ukrainians suffer from a constant and daily misinformation bombardment that seeks to undermine the morale of its people, yet elements of resilience in the form of a 'strong and clear criterion' regarding balance and imbalance of forces can still be found. As a result, this research examines the fundamental sources used by the Ukrainian population to obtain information, the use and reception of informative propaganda via social media, its critical analysis, the participation and interaction of the population in today's global communication spaces, and finally, the level of credibility of both foreign and national media in depth. The themes discussed were explored via qualitative research during a series of oral interviews conducted with subjects directly related with the defence of the country, women, and higher education professionals. Our conclusions highlight the challenges that disinformation poses upon the Ukrainian population and its national and international organizations in the fight against information manipulation.

Keywords

Disinformation; War; Propaganda; Social networks; Social media; Field study; Focus group; Fake news; Media literacy; *Telegram*; Zelensky; Russia; Ukraine.

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1. Introduction

Within the research and cooperation framework developed in coordination with the *National Police of Ukraine* (*Patrol Unit of the Police Academy*), the *Science and Technology Cooperation Program COST-H2020*, and the *Communication Department* of the *Ukrainian Army*, a field study was proposed to document disinformation in European societies where war is present.
https://www.cost.eu

The use and treatment of information is, without a doubt, a powerful weapon used in numerous international conflicts. Recent wars around the world have entailed a very significant burden on disinformation processes and strategies, which have tipped the balance in favour of one side or the other. As a logical reaction, worldwide public opinion, and European public opinion in particular, has been impelled to not be impartial, persuaded by the information that has reached their territories from different wars around the world.

However, this situation is not new. Human beings have been aware of the power of disinformation since ancient times. If one analyses it from a classical perspective, we find that

> "Aristotle taught and philosophized about the idea of disinformation when he contrasted, in parallel, the notions of good and evil on the one hand [sic] and of truth and falsehood, on the other" (**Díez-Medrano**, 2022, p. 2).

The history of humanity, therefore, is full of scenes and actions in which the manipulation of the enemy, and the group interest itself, was a fundamental tool for the consolidation and justification of certain facts, as well as a basic element for positioning a political or war-related idea. Manipulation is an exercise of power; a tool that is used without palliatives for the neutralization of the opponent.

From this point of view, one can understand that we are facing a new era of hybrid conflict, always starting from the premise of psychological manipulation, of influencing the perception of the enemy, and the use of communication as a multifunctional discipline. All of these are combined to achieve a certain level of influence on the protection of a nation state's interests. Many studies have been carried out in this field of expertise, and those conducted by **Cano** (2021), **Jordán** (2018) or **Manfredi-Sánchez** (2020) are worth noting. In the case of Russia and the current war in Ukraine, as studied and referred to in these pages, the main maxim is the ability to use different means of destabilization, not exclusively war-related, to deeply reach targets, and with great effectiveness. In this regard, the control of the different communication algorithms, social networks, and dissemination of media opinion, through international and national media, and even the use of artificial intelligence, is crucial. With regards to Russian disinformation policies, various studies provide sufficient information on the capacity of this country to use powerful weaponry to influence geostrategic control. Thus, interference in conflicts on the African continent (**Ruiz-Cabrera**, 2022), or in the recent war in the Donbas, a precursor to the current Russian invasion of Ukrainian territory (**Milosevich-Juaristi**, 2017), are important.

> "It is especially relevant, at a social level, and from the field of communication processes in general, to carry out a field study on the perception of information manipulation in population groups, with a special interest on the Ukrainian territory"

For these reasons, it is especially relevant, at a social level, and from the field of communication processes in general, to carry out a field study on the perception of information manipulation in population groups, with a special interest on the Ukrainian territory.

This exercise helped the research team describe and deepen the perception analysis of the affected population, and propose different formulas that can, at least, warn about the use of these deeply hostile communication strategies.

2. Bibliography review

Before the war between Ukraine and Russia finally broke out in 2022, the academic community had previously dealt with the consequences of the disinformation phenomenon and fake news, both in relation to the praxis exercised by information professionals (**López-Borrull**; **Vives-Gràcia**; **Badell**, 2018; **Posetti**; **Matthews**, 2018), and their influence on new forms of propaganda, which intervene as powerful elements in geopolitical conflicts (**Botei**, 2017; **Vamanu**, 2019; **Badillo**, 2019; **Guadagno**; **Guttieri**, 2021; **Pomerantsev**, 2022; **Magallón-Rosa**, 2022; **Saliu**, 2022).

Within this recent academic and research approach, the case for Ukraine and Russia has received special attention, and has been addressed in depth by various researchers focusing on the role played by fake news and propaganda on the diplomatic and information strategy of the two countries until the escalation of the conflict (**Khaldarova**; **Pantti**, 2016; **Boyd-Barrett**, 2015; 2018; **Helmus** *et al*., 2018; **Martín-Ávila**, 2018; **Murrock** *et al*., 2018; **Posetti**; **Mathews**, 2018; **Haigh**; **Haigh**; **Matychak**, 2019; **Colom-Piella**, 2020; **Manor**, 2021). Research has also been carried out, to a lesser extent, on the development of the war itself (**Aydemir**, 2022; **Chernobrov**; **Briant**, 2022; **Donofrio**; **Rubio-Moraga**; **Abellán-Guzmán**, 2022; **Geissler** *et al*., 2022; **Morejón-Llamas**; **Martín-Ramallal**; **Micaletto-Belda**, 2022; **Palomo-Domínguez**, 2022).

However, given the nature of war and its logistic difficulties, academic field research is difficult to find, as most of the work has been primarily focused on the study of social network contents and discourse analysis on traditional publications and media. Field research, both qualitative and quantitative, as proposed in the present work, remains practically non-existent.

3. Disinformation and war: Russia and fake news

3.1. Disinformation and international conflicts

Disinformation processes do not have a temporal frame that is circumscribed to the war process, but rather a path that grows over time. Some of the key aspects that citizens must face in the advent of a war are fake news, related publications, media controlled by pressure groups, social media takeover or the absence of good practices in the exercise of journalism and supranational communication. It can also be acknowledged that this disinformation machinery and their key aspects steadily progress until the very outbreak of war. The attention granted by Europe and the scholar community to the growing threat of manipulation of the news is quite recent. Badillo, for example, states that

> "the entire debate on disinformation in Europe is limited to the last five years." (**Badillo**, 2019, p. 25).

Although it is difficult to fully support this statement, we can point out that it was only recently when Europe began to see this phenomenon as a significant threat to citizen coexistence and even to the security of the continent. This has led to the creation of disinformation recognition tools, such as the web platform: "EUvsDisinfo" (*euvsdisinfo.eu*), and the recent development of a series of national resources that analyse and denounce false and biased information in different areas. These include those engaged with the spread of news that demoralize, agitate, or influence both the Ukrainian and world populations.

On the other hand, participation and media intervention, including that of the mass media, for the persuasion and modification of citizen awareness and opinion, have been developed through different phases. In this sense, we agree with other studies which focus their attention on the evolution of social networks from elements of democratization of the information, to places that can no longer be trusted. All of these developments of information systems have taken place in recent years, ultimately fostering

> "a consolidating trend: of an opaque world, in which there is information fatigue and more state propaganda." **Magallón-Rosa** (2022, p. 53).

Once the foundations for this phenomenon have been laid, it is clearly observed that Russia has taken the leading role in recent years. In this sense, one of the most notable events was the propaganda and fake news campaign during the US election process. Since 2016, **Posetti** and **Matthews** (2018) noted several relevant facts about Russian participation in the digital and social ecosystem, where large audiences participate. This destabilizing movement, which affects world powers, reaches its maximum expression with the accusation by the American intelligence agencies of Russian intervention in the presidential elections that were held that same year. However, this phenomenon is not recent. History sees Russia, since the Cold War, as a world actor and key player with a concrete ideology, one based on the resurgence of the nation against the threat of the West; therefore, it has a long tradition in the fight against Western media propaganda and any opposing ideologies (**Chernobrov**; **Briant**, 2020).

Ukraine would be just one more chapter in its logical development and position of expansion in its sphere of influence, a policy which is determined by resurgence. We agree with the opinion of **Ruiz-Palmer** (2015) that Russia, throughout history, has found timely justifications and training grounds in the Gulf War, the first war in Chechnya, the Civil War in Syria, or the war with Georgia. The truth is that the use of disinformation does not come as a surprise, rather it is a very valuable functional tool that Russia has been mastering since the Cold War and even prior.

Author **Colom-Piella** (2020, p. 473) points out that Russia has a long history regarding the use of propaganda aimed at internal political control and geopolitical expansion. The origins go back as early as the 19th century, via the activities of the tsarist secret police and the communist revolution. The *disinformatsiya* department was active well into the 1960s, managed by the *KGB* and under the authority of the *Politburo*, a key player during the Cold War. In this period, there was already talk of the:

> "'*Agit Prop*', a contraction that came from the Bolshevik era that meant 'agitation and propaganda" (*otdel agitatsii i propagandy*), and which designated measures aimed at influencing and mobilizing target audiences" (**Ruiz-Palmer**, 2015, p. 9).

The main objective of the Russian propaganda strategy in these decades would have been to communicate the positive aspects of socialism, and spread negative messages regarding the West. Consequently, the age-old tradition of using disinformation tactics such as propaganda gained an unusual height after Putin came to power, although somewhat more so since the US presidential elections and the war in Ukraine.

> Today, as years ago, Russian propaganda continues to see the West as its main target, and the objectives seem very clear: to discredit Western policies, destabilize their governments, and project Russian interests in the international sphere

Academic studies regarding propaganda techniques currently used by Russia are numerous. They tend to look into highly advanced technological elements, such as: the exploitation of bot networks, the use of trolls, or data mining to catalogue system users (**Colom-Piella**, 2020). In this technological field, the use of artificial intelligence may be starting, which will very soon make it almost impossible to identify hoax from truth (**Flores-Vivar**, 2019, p. 205).

It is also important to acknowledge the study by **Ponce-de-León** (2022) regarding the amount of news broadcasted by pro-Russian media for Spanish-speaking countries during the first months of the invasion. This study provided a definitive conclusion regarding the dissemination of information during the advancement of Russian troops, versus a decrease in news headlines as Russian troops retreated, all of which was justified under the banner of a 'motivational purpose' for the targeted audiences. At this stage, not only was false information given, but also propaganda, which was equally quite effective when correctly broadcasting genuine information at a given moment.

Today, as years ago, Russian propaganda continues to see the West as its main target, and the objectives seem very clear: to discredit Western policies, destabilize their governments, and project Russian interests in the international sphere.

Despite the fact that traditional mass media continues to be used as part of the Russian strategy via television channels such as *Russia Today* (*RT*), and news agencies such as *Tass* or *Sputnik*, the focus seems to have shifted towards the virtual world, particularly social networks (**Helmus** *et al.*, 2018; **Jaspe-Nieto**, 2021). In these virtual realms, Russia has developed its presence in digital and clandestine media such as blogs and websites, while also becoming engaged in the creation of bot farms to directly disseminate its propaganda strategy and fake news. In this sense, Russia has developed a multichannel and well-coordinated propaganda strategy via its own online and offline media platforms. This strategy reaches and impacts unrelated media outlets, through orchestrated disinformation campaigns aimed at generating controversy in the networks (**Jaspe-Nieto**, 2021, p. 6).

Within the framework of the current digital ecosystem, which exploits dynamics such as *clickbait*, the collaborative construction of news, or the rise of the creator's economy, the digital ecosystem allows for the dissemination of unverified content, and therefore, the spread of disinformation. Through a well-organized network of trolls, hackers, and analyst services, with ubiquitous presence in many digital spaces, Russia has taken advantage of this ecosystem by combining traditional and digital tools to reach broad layers of society.

3.2. Media uses and disinformation in Ukraine during the pre-war context

Without delving into historical details and staying with the war which concerns us, the starting point of the Ukrainian case arose in the year 2013, a time when the pro-Russian government of Yanukovych decided not to complete the process of entry into the EU (**Badillo**, 2019). Russian pressures took effect, and the rapprochement between Ukraine and the EU, after the dismissal of Yanukovych, led to the invasion of the Crimean Peninsula. In this sense, authors such as **Boyd-Barrett** (2015; 2018) agree that Russian communication channels eventually distanced themselves, and that the government of this country felt legitimized to carry out the invasion of Crimea, as a "response to Kiev's takeover of pro-Western power" (**Teurtrie**, 2022, p. 8). In fact, this interference by the Russian government, its institutions, and their media, has been studied by authors such as **Crăciunescu** (2019).

For example, the active role taken by the President of Ukraine, Volodymyr Zelensky, as a user of social media networks, has strengthened the counter-disinformation narratives disseminated by the Russian media. It is an underground war, hence

> "it could be stated that the two countries have been at war on social networks since shortly after February 2014" (**Donofrio** *et al*., 2023, p. 23).

However, the escalation and the impact of Russian propaganda in Ukraine has a specific date: the Crimean crisis in 2014 and the following separatist referendum on its political status, calling for its annexation to the Russia Federation. Following Putin's signing of its annexation and the lack of international recognition, Russian intervention in Ukraine has been increasingly frequent, with the development of various propaganda tactics that escalated up to the outbreak of war. In this sense, the downing of Malaysian flight MH17 over the contested area of the Donbas, following a (disputed) Russian missile strike, offers a propaganda counter-narrative that reveals the use of fake news to hold the Ukrainian forces accountable.

If we move forward in time, into the outbreak of the war, the range of fake news propagated by the Russian side has been varied, starting at the early stages of the war with: constant rumours that President Zelensky fled Kiev during the

first weeks of the conflict, the use by Ukraine of 'actors' hired to play the role of war victims, the systematic denial of attacks on civilian installations under the argument that the operations would have focused only on military objectives, and the discouragement towards Ukrainian refugees fleeing to Poland, from spreading false news about attacks to Polish citizens at the border (**Wesolowski**, 2022; **Fasano**, 2022; **Alonso**, 2022).

In Russia, Putin has used his available resources to fuel a nationalist and patriotic discourse focused on reclaiming the role of the former Russian empire as a superpower on the international stage, a role (according to this narrative) necessary in an increasingly multipolar world. His attacks have focused on what he sees: a declining hegemonic West trying to impose its influence on Ukraine. During this time, the use of social networks through a coordinated bot strategy that exposed Ukrainian users to previously selected topics, has been a constant occurrence (**Geissler** *et al*., 2022, p. 21; **Khaldarova**; **Pantti**, 2016, p. 19; **Jaspe-Nieto**, 2021). In Ukraine, on the other hand, the message has been very different, where reaching out to a niche population favourable to its interests, and fostering political divergences in order to disseminate a story that would influence public opinion, was proffered. In this sense, the Russian propaganda tactic since the beginning of the war has been focused on showing the invasion as measured and selective military operations that sought to liberate regions which had legitimately decided to declare themselves as pro-Russian. Also, part of the Russian state propaganda tactics has been the liberation of these regions from a neo-Nazi state while protecting Russian ethnic minorities and disassociating itself from any influence on the rebel militias.

For several years now, Moscow has used a "mirror technique" in its information rhetoric regarding the war, replicating the information from the *Ukrainian Government* but focusing on content that endorses its priority themes and objectives. Here, the defence of the language aspect, as a vehicle of national identity and its dissemination message, has played a vital role in its propaganda tactics to maintain its influence in Ukraine (**Jaspe-Nieto**, 2021, p. 4). This has made a large part of its Russian-speaking population an audience of media sponsored by the Kremlin.

3.3. Ukrainian disinformation and media uses as a defensive tactic

Related to the specific object of our investigation, we need to highlight the creation of a defensive counter-narrative aimed at raising the morale of the Ukrainian people. This narrative, as **Palomo-Domínguez** (2022, p. 2) indicates, is not only produced in the invaded territories, but is intended for a "European creative community", hence "allowing them to contribute in an influential way to the storytelling present and which surrounds this war".

In the last year, it has been shown that this type of storytelling and its implementation strategy has some similarities with regards to an earlier Russian narrative, particularly in aspects related to disinformation such as: political bias, the intervention of foreign agents, botnets, conspiracy messages on social networks, etc. (**Haigh**; **Haigh**; **Matychak**, 2019). Since the start of the war, numerous fake news items designed to raise the morale of the Ukrainian population and exalt the heroism of its army have appeared, most of which have circulated on networks such as *Twitter*, amplified by official Ukrainian government accounts. Thus, fake news with a 'markedly creative component', such as that of 'The Ghost of Kiev', a pilot of unknown identity who would have shot down several Russian planes, or 'The guards of the island of the snake', a story about a Russian military unit that while advancing towards this island, offered an ultimatum to the thirteen border personnel that guarded it, with these guards heroically resisting before being assassinated (**Cook**, 2022; **Thompson**; **Alba**, 2022). Both of these news items, shared via the official *Twitter* account of the Ukrainian government, were retweeted thousands of times and proved to be false. These are just two examples of the line of propaganda followed by the Ukrainian government, aimed at both its own population and the international media, and characterized by a strategy that aims to provoke sympathy for Ukraine and hostility towards Russia.

From the Ukrainian side, the success of Kiev in the face of adversity is emphasized, highlighting a narrative of counter challenge (**Aydemir**, 2022, p. 8) with videos and stories of Zelensky, as leader, occupying a central role, through an extensive use of traditional media and social networks. These narrative highlights that the Russian invasion damages international peace, hence Ukraine conveys the need for universal condemnation of a serious problem which affects Europeans; in fact, we are at the earlier stages of a greater setback with regards to how human rights are violated by Putin´s regime. In the same manner, Ukraine messages try to show that it does not pose a strong military threat to Russia, and highlights the atrocities committed by the Russian army, and their effects on the daily lives of the civilian population in the country and, in the long term, on the European continent itself.

Figure 1. Post about "The Ghost of Kyiv" made by the official *Twitter* account of the Ukrainian government.
https://twitter.com/Ukraine/status/1497834538843660291

The narrative led by the Ukrainian government is complemented by a recurring representation on social networks of imagery from women in the front lines with Molotov cocktails, military suits, or carrying weapons, which stands out as a symbol of the people's resistance to the occupation. This type of Ukrainian propaganda and fake news is intended to emphasize a message of heroic resistance to win the support from international public opinion. At this stage, the collaboration exercised by hundreds of international streamers has been a key factor. The counter-narrative proposed by the Ukrainian government has attracted and garnered the attention of content creators worldwide, indeed a remarkable event. Although these content creators do not normally deal with issues related to journalism or international geopolitics on their channels or accounts, many of them came to Ukraine and, as a result, provided a communicative structure and a public tone which favoured the direct monitoring of the war, but also turned it, to some degree, into a spectacle.

Figure 2. The Mexican YouTuber @alextienda narrated the conflict and recounted his live difficulties while leaving the country when the conflict entered its crudest phase.
https://www.youtube.com/watch?v=MeoOiqazJcw

On the other hand, dozens of Ukrainian streamers have broadcasted live videos, interrupting their broadcasts due to the bombings, others recounted what their days were like living in a bunker, or said goodbye to their homeland while undergoing a journey as refugees.

4. Research objectives and questions

The main objective of the present study, through various qualitative methods, is to analyse the uses and consumption of media and information by Ukrainian citizens during the war with Russia, and to highlight the relationship they develop with the disinformation strategies adopted by both sides. Through a qualitative field study which compiles testimonies from the actors involved, we also intend to answer the following objectives or research questions:

- To investigate if Ukraine citizens play a proactive role in the generation of informational content related to the war or if it is simply reactive.
- To discover if they confer greater credibility to journalists and traditional media or if, on the contrary, they prefer to experiment with new forms of communication linked to the digital world: streamers, influencers, etc.
- To clarify whether these same citizens have the necessary analytical tools and habits to identify false news on the Internet and what behaviours they tend to develop in such case.
- To discover the importance given by Ukrainians to fake news and informative propaganda as useful tools for the development of the war.

Based on the analysis of results and the proposed methodology, while paying great attention to the instrumentalisation of the propaganda message, in the context of the digital and collaborative ecosystem, in which society find itself today, it is possible to conclude that this system continues to be of crucial importance during war and conflicts. Yet this research aims to discover aspects of this ecosystem: the use of new technologies, and the appearance of participatory environments increasingly built by and for audiences. While the rise of content creators, who have diversified the information spectrum offerings, and introduced practices of transmission in real time, have significantly changed the effects and broadcast strategies of the message, these players are facilitating the dissemination of propaganda and modifying its effects from a geostrategic point of view.

5. Methodology

The impact of the Ukrainian war on disinformation and media is a documented fact. This research delves into this matter through a field study carried out between October and November of 2022. After establishing contact with military authorities from Kiev and Kharkiv through the *United Nations* and the *Spanish National Police*, numerous meetings and interviews were organised; these involved: thirty qualitative interviews, many visits, a focus group, and conversations with organizations involved in the war effort such as:

- *Mission Jarkiv*
  https://missionkharkiv.com
- *Help the Army 2014*
  https://www.facebook.com/help.army.kharkiv
- *Warrior Liberation Women Association*
  https://freeourheroes.com

Interviews were also organized with different members of Ukrainian society and institutions, such as military personnel, police officers, teachers, doctors, lawyers, nurses, volunteers, and translators between the ages of 18 and 65. In addition, a meeting was arranged, under strict anonymity, with a special envoy from one of the major North American media outlets.

The interviews took place in three cities in the country: Chernivtsi, the capital Kiev, and the major secondary city Kharkiv, between October 17th and November 6th, 2022, a period in which artillery and air bombardment attacks by the Russian Federation intensified on vital Ukrainian infrastructure, while the Kharkiv Oblast was mostly liberated from Russian occupation.

> "Although these content creators do not normally deal with issues related to journalism or international geopolitics on their channels or accounts, many of them came to Ukraine and, as a result, provided a communicative structure and a public tone which favoured the direct monitoring of the war, but also turned it into a spectacle"

In this context, a series of interviews and a focus group were conducted with the *Warrior Liberation Women Association (WLWA)*, an association formed by women, daughters, sons, and relatives of more than 8,000 fighters from the Azovstal-Mariupol power plant who were held as prisoners of war by the Russian Federation. The interview lasted for approximately three hours, involved 12 individuals, and was held at a café near the Monastery of St. Michael in Kiev.

This selection of interviewees covers a range of professions that remain prominent during the war in Ukraine, and provides a relatively broad view of the media consumption habits of the Ukrainian people who were socially and professionally active.

A quantitative methodology was discarded, as most of the interviews and meetings were conducted in the first or second line of combat. In addition, continuous indiscriminate bombings and attacks on networks and communication structures by the Russian Federation made it virtually impossible to generate quantitative data through the internet or social media. Therefore, data had to be obtained through individual interviews, scheduled visits, or the focus group.

This documentation process, which received logistical support from the communication department of the Ukrainian army, the Ukrainian police, and the National Guard, generated a series of qualitative primary evidence and sources that served as the crux of presented research.

6. Analysis

The excess of information facilitated by the digital ecosystem, through the proliferation of media platforms and information networks, causes fake news or poorly contrasted information to have more opportunities to spread at a greater speed than ever before (**Badillo**, 2019). In armed conflicts where propaganda has always played a fundamental role, this phenomenon is even stronger. After conducting field study interviews, several coinciding aspects were detected: first, a great distrust of Ukrainian citizens towards media outlets close to the Russian sphere. The statements show that the Ukrainian population is aware of the disinformation and propaganda that comes to them from Russia, which circulates mainly through digital telematic channels. This research clearly highlights that the inherent characteristics of fake news messaging were clearly identified by those interviewed. In this sense, Ukrainians are looking for alternative channels of information.

> "We use everything we can, especially now that there is a lot of information about the war. However, there is confusion of information here and there, so we are using all the sources we can to gather information about our relatives under Russian detention. We are especially looking for what we need." (Female member of *Warrior Liberation Women Association* participant in the Focus Group who prefers to remain anonymous, Kiev, October 30th, 2022).

For example, this trend was particularly evident in the case of the focus group conducted with members of the *WLWA* (women, daughters, and relatives of fighters from the Azovstal power plant in Mariupol). It should be noted that these soldiers are prisoners of war of the Russian Federation and that, in their case, they have received extensive coverage in both traditional media outlets and social networks due to a long siege and detention, in which they became a symbol of Ukrainian resistance during the conflict.

Some of the interviews with the women of the *WLWA* showed that for them, as well as for certain groups of the Ukrainian population, the internet, and social networks, as well as local and mainstream press, were "forensic tools" intended to help them find relatives, friends, and acquaintances who were/are in a situation of imprisonment, which, as of the date of the interview, exceeded 8,000 combatants in Russian hands. This issue could be contrasted with what is indicated in the *Geneva Convention*.

Therefore, as we have noted, the interviewees coincided in stating a total distrust towards Russian media, preferring (according to some testimonies) international media or social networks as favoured options to stay informed.

There is an increasing awareness of the power of social networks in the hands of citizens (**Geissler** *et al*., 2022), as elements for the dissemination of information on the ground, on international public opinion. Today, these citizens also play an active role in the intentional creation of propaganda, taking advantage of the collaborative power of these types of platforms.

> "During the beginning of the war, I shared ads on social networks, such as: people looking for equipment to dig trenches in Kiev, free spaces in cars, or places to stay for the displaced." (Member 2 of *Warrior Liberation Women Association*, Kiev, October 31st, 2022).

> "With regard to sharing content on social networks: when we were in Mariupol, we had no electricity or internet, so we had no possibility of sharing anything (...) I wanted to, but physically I couldn't." (Member 4 of *Warrior Liberation Women Association*, Kiev, October 31st, 2022).

The sources consulted in both Kiev and Kharkiv agreed that mental health and clinical support were crucial when operating and working in war zones. It is important to recognize that those who experienced such situations were dealing with traumatic events that will leave a mark on them for the rest of their lives. These experiences are documented by both combatants and medical personnel or volunteers on the front lines, resulting in graphic and explicit content that can increase the incidence of "digital trauma" among the Ukrainian population.

Social media has become a powerful tool for shaping public opinion, especially when the information space is contested, as is the case in today's internet. This has led to a fierce battle between opposing factions to establish the dominant narrative of the conflict, often using social networks and memes as a means of disseminating their viewpoints. Citizens are now aware that they are actively participating in this conflict, what some have called "the art of memetic war" (**Yankovski**; **Scheirer**; **Weninger**, 2021).

Figure 3. Photo of a fighter from the Azovstal power plant in Mariupol. On the right, his appearance after his arrest and torture, by the Russian Federation. Shared on social media by a relative, member of the *WLWA* and participant in the focus group conducted in this research.

Thanks to platforms such as *Twitter*, *Instagram*, *Reddit*, *Telegram*, and *TikTok*, Ukrainians are now able to share personal stories, videos, and photos. This allows for a more personal and honest view of the war and its consequences, free from government euphemisms and academic analyses (**Ciuriak**, 2022, p. 6). In one example, a young woman documented her experiences in a Chernihiv bunker during Russian bombardments on *TikTok*, and other citizens have similarly shared their stories as "citizen chroniclers" who understand the power of real-time reporting on social networks.

Returning to the results from the field study, many of the interviewees also expressed being very aware that the Russian government influences the opinion of Ukrainian citizens by spreading its political discourse through the media. There is also a clear awareness of the danger posed by Russian media when it comes to becoming informed about the latest news on the conflict (**Martín-Ávila**, 2018; **Geissler** *et al*., 2022). This is the case of another woman from the *WLWA*, whose husband is now a prisoner of war of the Russian Federation, which creates a conflict within her family nucleus that is projected on her social networks.

> "When I lived in Donetsk, under the so-called People's Republic, I understood how the Russian media operated. For them, black is white and white is black. (...) We still have family members who watch Russian propaganda on social media and television, but we can't persuade them it's false. My mother-in-law still supports Russia, and this causes conflicts in the family." (Member 1 of the *Warrior Liberation Women Association*, Kiev, October 31st, 2022).

Another interesting case being that of Major Alexis, a police officer and weapons instructor at the Kiev academy, whose ex-wife, with whom he shares a 17-year-old son, is on the Russian side, causing a serious family conflict.

> "My first wife, with whom I previously lived in Donetsk, is now living in Russia with her new partner. She is active on social media and shares Russian propaganda, which has caused our 17-year-old son to stop following his mother on social media, and they no longer communicate with each other. The mother-son relationship has been broken." (Major Alexis. Police Officer and National Guard. Kiev, October 25th, 2022).

As previously stated from the citizen's perspective, Ukrainians are aware that the war is also being fought within the realm of information. From the military side, there is a special emphasis on the effects of misinformation and propaganda on the morale of the troops, and the interesting effects it has on the development of the war, so they carefully monitor their information channels.

> "Some of the interviews with the women of the *WLWA* showed that for them the internet, and social networks were "forensic tools" intended to help them find relatives, friends, and acquaintances who were/are in a situation of imprisonment"

> "At my job, there is a conference once every two weeks to talk about the situation. My boss (economic police), who is in Kiev, gives me information that is more accurate than what is here (Chernivtsi)." (Vassily, 24 years old, Economic Police, Chernivtsi, October 18th, 2022).
>
> "They are releasing the news that we are allowed to know. They are providing information in a softer way, so as not to destroy the spirit of the civilian population. For example, the death toll numbers published in the media are different from the numbers that I handle (...) Depending on the military rank, the access to information is different." (Major Alexis. Police Officer and National Guard. Kiev, October 25th, 2022).

In general, based on the military and police sources consulted, there is some degree of distrust towards the accuracy of information treatment by the creators of content in new digital channels, which are not associated with rigorous and in-depth information processing.

> "I prefer the media over social networks, as they conduct interviews and have access to the president and ministers, which is why I trust the official media."
>
> "Influencers have their own interests in presenting news, which is why I trust the official media more." (Vassily, Economic Police, Chernivtsi, October 18th, 2022).

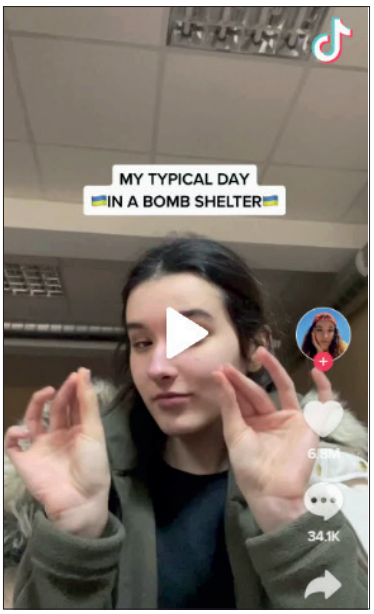

Figure 4. Ukrainian citizen @Valerissh showing her life in a bunker on *TikTok*

A notable aspect is that different regional affiliations regarding the conflict also shape media habits and practices within Ukraine. Similarly, as **Murrock** *et al*. (2018) pointed out, greater media literacy and the ability to detect fake news also depends on geographical belonging, as well as socio-economic and demographic groups, with younger populations and residents of Kiev, Chernivtsi, and Kharkiv being the least susceptible to this type of information.

> "When the Ukrainian war began, there was a lot of misinformation from the Russian side. In this area (Chernivtsi), there is a lot of support for Russia, but the war is in Luhansk, Donetsk, Kherson, and Mariupol. They create 'official' channels on *Telegram* that are actually false. Those channels were eliminated. They talked about how all of Ukraine will die... how a small enemy cannot defend itself against Russia... etc."
>
> "The Russian media is very deceitful." (Vassily, Economic Police, Chernivtsi, October 18th, 2022).

On the other hand, the perception of disinformation as a negative element that plays an important role in the conflict, has led to the emergence of initiatives such as *StopFake*, a project from the *Media Reforms Center NGO* that has been operating since 2014, and was founded by communication professors and students. Initially, its objective was to dismantle Russian propaganda, and today it has grown into a program that is broadcasted on various TV and radio channels, with a strong following on social media. This concern has also been shared from the state level. The Ukrainian government has also developed various programs to increase media literacy and help its citizens discern propaganda or fake news. Numerous programs such as *Learn to Discern* have been implemented by the country's authorities, sometimes in collaboration with international programs, to assist in the media literacy of the population.

On the Russian side, they continue to rely primarily on traditional media, such as *Russia Today* or *Channel 1*, and target independent media. Since the beginning of the conflict, there have been cases of censorship and the closure of media outlets that do not adopt the regime's official line. Access to digital platforms such as *Twitter* or *Facebook*/*Meta* has also been restricted. Notably, local media outlets have been closed for fear of being accused of publishing "false" or unauthorized information and of facing heavy economic or prison sanctions. These include *Echo Moscow*, *MediaZona*, and *Novaya Gazeta* (**Corral-Hernández**, 2022). Meanwhile, on the Ukrainian side, there has been a significant use of social media, as previously mentioned. One of the most commonly-used tools in Ukraine to stay informed about the conflict is the messaging channel *Telegram*. Alerts are sent about Russian bombings and offensive strikes through both *Telegram* and *Viber*, or applications such as *Air Raid*.

> "When the conflict started, all my friends had *Instagram* or *Telegram*, but when the war began, we used it to reach the young people who had no interest in it. To reach more people. For example, when the war started, the President and the Ministries wanted to unblock the Swift, and many people shared and distributed this important information for Ukraine. Many people and friends distribute information about Ukraine." (Vassily, Economic Police, Chernivtsi, October 18th, 2022).

> The widespread use of social media is not shared in the same manner by the interviewed military personnel. The interviewees mostly agree in pointing out that regarding useful information related to the conflict, they preferred to trust the media directly linked to their chain of command

At other times, the use of social media can cause problems for its users if the adversary is nearby, as they become tools for detection and denunciation.

> "My husband took us from Mariupol to Melitupol. Two days after our arrival, Russia occupied the city. So even if I wanted to post something, it was difficult because the Russian army was monitoring social media, and they were also looking for us and my family." (Member 6 of the *Warrior Liberation Women Association*, Kiev, October 31st, 2022).

The widespread use of social media is not shared in the same manner by the interviewed military personnel. The interviewees mostly agree in pointing out that regarding useful information related to the conflict, they preferred to trust the media directly linked to their chain of command.

> "Unfortunately, I don't trust television, social media, YouTube, or any channel. I mainly trust my colleagues who are on the second or first line of combat." (Major Alexis, Police and National Guard, Kiev, October 25th, 2022).

Figure 5. Ukrainian soldier Alex Hook's *TikTok* channel

However, evidence gathered from social media posts during the conflict suggests that frontline Ukrainian soldiers are utilizing these platforms for purposes beyond obtaining information related to the conflict. Instead, they are using them to document their daily lives in real-time or communicate with their families. A paradigmatic example of this is the late Alex Hook, a Ukrainian soldier who posted *TikTok* videos of himself dancing to assure his family that he was safe and well amidst the turmoil of war.

> "At the beginning of the war, *TikTok* was used (...) to document the movement of Russian troops, but it was censored..."
>
> "*Facebook* and *Instagram* are also used by frontline soldiers."
>
> "*Telegram* is the most important, both for Ukrainians and Russians." (International press editor. Maidan Square, Kiev. October 22nd, 2022).

On the other hand, it is noteworthy that the consumption of international media to obtain accurate and propaganda-free information about the conflict, which could be an effective alternative, also presented problems for those interviewed.

> "As for Western media, we feel they are objective, but they do not have a deep understanding of the problem."
>
> "The so-called Donetsk Republic is not a separate ethnic group, quite the opposite. It is a complex territory where many different ethnicities and nationalities can live, which is different from what I have read (in international press)." (Member 3 of the *Warrior Liberation Women Association*).

There remains a certain level of distrust towards Western media, despite acknowledging their supposed objectivity. This may be driven by a fear of losing allied support in the war effort.

7. Conclusions

The study has shown that Ukrainian citizens use multiple channels to obtain information about the war. This use integrates a wide range and corpus of practices, ranging from maintaining habits of consumption of information produced by traditional media to follow major war-related news, social networks and instant messaging channels, used for both "micro" utilities (communication with family members, denouncing enemy actions, equipment needs or sharing of spaces to stay in), to documenting the everyday life of the war.

The responses from the interviewees, as well as the evidence found on social networks, show the widespread use of digital tools and social networks such as *TikTok* among military personnel. The objectives are similar to those of the civilians who document certain aspects of the war and reassure their families. Other networks such as *Facebook* and *Instagram* were also much used by soldiers on the front lines, while *Telegram* seemed to be the preferred network of both Russians and Ukrainians.

The data collected through observation of networks, as well as the data from the interviews conducted on the ground, showed that "the first global war in the era of social networks" has modified the method by which propaganda, inherent to wars, is created. This new framework, within the digital ecosystem, has made audiences 'prosumers' of propaganda. The Ukrainian people seem to be aware of the intentionality of many of the digital tactics undertaken by the enemy and their capacity for participation, although they have also discovered the usefulness of some social networks and instant messaging channels, some of which are not sufficiently efficient for obtaining practical information and staying in touch with their relatives on the front line. On the other hand, social networks and mobile phones have turned hundreds of citizens into "real-time chroniclers" of the war, who describe everyday situations and are aware of the amplified importance of their publications in the international context.

The general population has become aware of the potential of social networks to generate awareness among their less-mobilized fellow citizens. Some sources have pointed out that they actively participated by sharing important infor-

mation for the country on their social networks or messaging channels, such as the unblocking of international payment and transaction system *Swift*, enacted by the Ukrainian government. Logistical constraints, such as subsequent internet shutdowns or fear of being detected by the adversary, have influenced media consumption and distribution habits.

Similarly, the conflict has attracted hundreds of content creators and influencers from around the world. This has contributed to making a certain spectacle of the conflict and a perception of lack of rigor that is associated with these digital channels by much of the public. Several responses given in the field research showed that these channels have not yet earned the trust of much of the Ukrainian population as primary sources of information about the war.

Some interviewees still give, despite their initial mistrust, greater credibility to traditional media due to various aspects, such as access to sources or economic and logistical capacity, as compared to streamers or content creators. Contrary to initial expectations, the consumption of international media was also problematic for interviewees who, even when granted a more objective approach to national media, argue against it in terms of their distance and little implementation on the ground, to provide rigorous and in-depth information about the war.

The responses of the interviewees demonstrate a clear identification of the propaganda related to the conflict, both from the Russian side and their own. In many cases, media consumption varied by geographic location, age, and affiliation, sometimes separating families based on whether their sympathies were pro-Russian or pro-Ukrainian, which determined their media and propaganda consumption.

In the military sphere, some sources stated they only trusted members of their chain of command, who were much closer to the information events. Several sources also evidenced the clear attempts at disinformation by the Russian side through "official" *Telegram* channels that were quickly eliminated by the Ukrainian authorities. Another source of propaganda identified by the consulted individuals is the Russian-influenced *Orthodox Church* in Ukraine, especially targeting rural areas and older age groups of Ukrainians.

After studying and monitoring some specific trends that have accompanied the development of the war, it is observed that propaganda continues to have a crucial importance during armed conflicts, a perception not ignored by the involved citizens. However, some aspects derived from the digital environment, such as the increasingly prominent participation of audiences turned content creators, the diversification of informational offerings, or real-time transmission practices, have changed some of these propagandistic strategies. Today, the ease of dissemination of such propaganda has increased exponentially but also necessarily, considering aspects that involve the algorithm.

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Stances on hate speech: Population opinions and attitudes

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Abstract

This research aims to know the opinions and attitudes of the Spanish population towards hate speech through a survey of 1,022 persons of both sexes and over 16 years of age. The results show a high awareness of hate speech: participants could identify these messages, assess their different intensities of severity, and understand the harm it causes. This high awareness may be because almost half of the sample has felt alluded to by these types of messages at some point. This group is more proactive in denouncing and counterattacking hate messages, although it is more frequent to remain on the sidelines. There is a hierarchy in the ratings in which racist and sexist comments are considered more severe than those directed at other minority groups (e.g., homeless people). Among the main reasons why people publish these expressions, participants point to the education of the authors, in particular, the rudeness and disrespect that are also perceived as a generalized aspect in today's society. The polarized Spanish political context is seen as beneficial to the appearance of these messages, as well as the lack of a democratic culture that respects ideological diversity. What is most interesting is that although there is awareness of the seriousness of hate messages in other spheres and towards various groups, hate speech has become normalized in politics, as previously stated.

Keywords

Hate speech; Hate speech detection; Perception; Opinions; Attitudes; Surveys; Social media; Digital media; Political polarization; Hate severity; Anti-hate; Spain.

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1. Introduction

The objective of this research is to understand the Spanish population's opinions regarding and attitudes toward hate speech (HS), using a nationwide survey. These types of speech are socially and culturally constructed; they represent an agreement among people about which messages are hateful and which are not (**Papcunová** *et al*., 2021). However, the indicators that characterize these expressions are subject to interpretation and change over time. This means that hate in the media and on social networks (SN) has a subjective nature that varies depending on the context, the country, and even each individual (**Salminen** *et al*., 2018). Thus, there is no universally accepted definition, and the concept is constantly being modified in public and political debates. **Tontodimamma** *et al.* (2021) identify, however, the following common features in the different definitions: the targeting of a group or an individual as a member of a group; the presence of content that expresses hatred, hostility, and prejudice and causes harm and incites wrongdoing; the public nature of the speech; and, finally, a context that makes backlash possible.

Hate can be directed toward groups in power, but usually the main target is groups that are vulnerable because of their race, ethnicity, gender, sexuality, and religion, among other aspects such as intellectual or physical disability and political preferences. This trend increases when people belong to two minority groups, for example, being a Black woman (**Morales**; **Grineski**; **Collins**, 2019), because hatred is a part and a symptom of intergroup conflicts and subordination (**Schweppe**; **Perry**, 2021). This type of speech may also promote hatred of entire belief systems, such as Islam (**Cervone**; **Augoustinos**; **Maass**, 2021), but it is unclear whether praising a group that clearly expresses hatred (neo-Nazis, for example) is considered HS, according to some studies (**MacAvaney** *et al*., 2019).

Generally the primary objective of these messages is to connect with like-minded people to support their cause (**Hawdon**; **Oksanen**; **Raesaenen**, 2017). However, some authors believe that that intention is not a defining feature, since it is usually posted or verbalized regardless of whether it elicits response or affects the group (**Malecki** *et al*., 2021). This discrepancy is due to the fact that the HS expressed has a variety of intensities and objectives: It can stigmatize, discriminate, and produce harm, or simply engage users in debate (**March**; **Marrington**, 2019).

These remarks use explicit but also less obvious means (metaphors, irony, and sarcasm) to legitimize themselves. Of these methods, humor stands out, as it is used to mask offensive content and cross the boundaries of what is off-limits. The consequences of this hate speech, whether outright or subtle, are very serious since they perpetuate prejudices, stereotypes, and group hierarchies and are used to justify violent actions.

Measures taken by online platforms to deter this speech are based on debatable concepts of harm and violence (**DeCook** *et al*., 2022), and automated control systems (**Aljarah** *et al*., 2020) prove ineffective against some rhetorical forms (**Udanor**; **Anyanwu**, 2019); furthermore, terms must be constantly updated because users modify them to circumvent controls. Content moderation is also disputed because it is perceived as a form of censorship that limits freedom of expression (**Paz-Rebollo**; **Cáceres-Zapatero**; **Martín-Sánchez**, 2021), which is why the academic literature relies on users' initiative to counter hateful content.

1.1. The perception of hate speech

Individuals intervene in response to a comment if they perceive its seriousness and if they feel obliged to act (**Leonhard** *et al*., 2018). Both the responses and the perception of these aggressions are conditioned by existing regulations, social values, each country's cultural and historical tradition, and the dynamics of public opinion (**Udapa**; **Pohjonen**, 2019), as well as by people's day-to-day experiences on the internet, their sociodemographic characteristics (age, gender, educational level, and political ideology, among others), and individual attitudes.

Some research has focused on the younger population, because this is considered to be the age group that spends the most time online and is therefore at a higher risk of encountering and being affected by these messages, but the results are not definitive. After interviewing the student body of a Polish university in Wrocław, **Malecki** *et al*. (2021) concluded that they are able to distinguish between cyberbullying, HS, and trolling. However, **Rad** and **Demeter** (2020) surveyed adolescents in four countries at different educational levels and state that, although young people are familiar with HS, they find it difficult to define and to understand what mechanisms trigger it. In this study, a representative sample of the general Spanish population were surveyed because more and more adults are interacting on social networks (*INE*, 2021).

Regarding the perception of the seriousness of these messages, ideology has been considered an important variable, but there is no consensus in this regard either. For example, in the United States, data indicate that conservatives consider HS to be less serious than Democrats do (**Costello** *et al*., 2019), but the study by **Frischlich** *et al*. (2021) in the German population found no significant association between engagement in antisocial behavior and voting intention. The relationship between political radicalization and the rise of extreme right-wing groups in the dissemination of messages of hate both in Spain (**Paz-Rebollo**; **Mayagoitia-Socia**; **González-Aguilar**, 2021) and in other countries (**Maatta**; **Suomalainen**; **Tuomarla**, 2021) seems clear.

Gender significantly shapes the perceived degree of offensiveness of HS: Women rate messages that directly incite violence as more offensive than men do (**Bautista-Ortuño** *et al*., 2018), and it is more important to them than whether they agree or disagree with the statement (**Wojatzki** *et al*., 2018), regardless of the setting in which it occurs (**Czopp**;

Monteith, 2003). That being said, the assessment of severity is also influenced by belonging to a group targeted by hate (**Bautista-Ortuño** *et al*., 2018) and, in this sense, it should be taken into account whether the population –both the general population and young people– has been exposed to online hate often because they belong to a vulnerable group (**Hawdon**; **Oksanen**; **Raesaenen**, 2017; **Costello** *et al*., 2016).

Regarding how users can respond to this speech, direct public intervention that offers a counterargument to the message writer (**Hangartner** *et al*., 2021), refuting their ideas in support of the victims, are reported. Indirect interventions –which involve reporting these messages to the managers of social networks, thus avoiding confrontation with the aggressor– are also mentioned. Although the latter predominate, it should be noted that, in general, observers very rarely react (**Kunst** *et al*., 2021) to avoid potential social repercussions (**Woodzicka** *et al*., 2015).

Ultimately, the increase of HS in recent years and the continuous exposure to it lead to widespread desensitization and normalization (**Soral**; **Bilewicz**; **Winiewski**, 2018), which is currently a challenge for social researchers. The search for solutions requires knowing what the public thinks about these practices. Their opinions and attitudes may provide clues for evaluating possible interventions against HS and as to the motives that drive them to act.

2. Objectives and research questions

Identifying and quantifying hate is not an easy task because of the vastness of digital and media communication and the diverse social contexts in which hate is disseminated, as explained above. For this reason, and for that mentioned above, this research pursues two main objectives:

GO1: To understand the opinions and attitudes of the Spanish population regarding hate speech.

GO2: To analyze whether the variable "having felt that hate speech in the media and on social networks had been directed at them at some point" influences perception and awareness of such speech.

To address these objectives, the following research questions will be answered:

RQ1. What is people's perception of their own ability to identify hate speech, and how do sociodemographic variables influence this self-perceived ability?

RQ2. In which areas do citizens notice more hate, how has this evolved in recent years, and which groups do they consider to be the most frequent targets of hate speech?

RQ3. What do they think are the reasons that lead to such speech, and what suggestions do the general population have to fight back against it?

RQ4. Does having felt as though HS had been directed at them influence the actions they take to deal with it, their perception of the seriousness of this speech, and their attitude toward this phenomenon?

3. Methodology

A quantitative methodology has been used, based on the design, application, and analysis of a survey of our own creation, to broadly analyze the perception of HS. The tool was designed by the research team (the authors of this paper), checked by the experts of the company in charge of applying it (*Fundación iS+D*), and tested in a pilot test. A qualitative convenience sample,[1] which was not part of the final sample, was conducted to detect possible flaws in understanding and general structure (organic sequence of the questions and sections). No errors or biases were detected, but the design of the questionnaire was improved by slightly modifying the wording of some of the examples of HS used so that they would be more understandable when read outside of their original context. The final questionnaire is structured in 18 closed questions,[2] conducted online (*computer-assisted web interviewing*, *CAWI*) via e-mail, and lasts 10-15 minutes. The questions inquire about respondents' reported ability to identify hate in messages, the groups they consider most likely to be on the receiving end of such speech, the reasons behind such speech, and whether or not HS has increased in the last five years. Another block of questions relates to having felt as though these messages were directed at them and how this situation has affected the reception of and reaction to such messages. Finally, they were asked about the perception of severity of HS, how they assess the rhetoric used, and what actions in their opinion should be taken. The examples of hate speech included in this questionnaire to measure the population's perception of its severity have been created bearing in mind the *Anti-Defamation League*'s pyramid of hate (*Anti-Defamation League*, 2015), which classifies different levels of severity of hate speech; they have also drawn from previous research on the presence of hate on *TikTok*, *Twitter*, and *Facebook* (**Herrero-Izquierdo** *et al*., 2022) and from comments posted to the digital press (**Bonaut**; **Vicent-Ibáñez**; **Paz-Rebollo**, 2021). These items reflect a gradation in the severity of hate speech –including derogatory and hurtful terms; disparagement of personal characteristics, humiliation and moral disqualification, and insults; and physical threats and appeals for violence and extermination– which provide a sample of the different rhetoric and groups that are usually objects of hate in Spain.

3.1. The population and sample

The general population residing in Spain, older than 16 years of age, was evaluated to develop an extensive and in-depth study of their experiences with HS. The sample, sociodemographically representative of the Spanish population, was composed of 1,022 subjects of both sexes, respecting the population distribution by age groups. The sampling was

calculated on the simple random assumption, with quotas for sex, age, *General Media Study* (*EGM*)[3] status, and autonomous community by Nielsen area (Catalonia and Balearic Islands [Northeast]; Levante; Andalusia [South]; Central; Northwest; North Central; Canary Islands; Barcelona Metropolitan Area; Madrid Metropolitan Area). The margin of error was ±3.1% with a 95% confidence level ($p = q = 50\%$). The fieldwork was conducted by the *Fundación iS+D* between April 27 and 29, 2022.

> People with a higher level of education, higher social class, and left-wing ideology felt more competent at identifying this speech. No significant differences were observed between women and men, or according to age group

3.2. Variables

For this study, a series of variables were selected and measured with the data collection tool designed and applied to the sample for this research. These variables are as follows:

- *Sex:* This variable was measured with three categories: Female (50.6%), Male (48%), and Other[4] (1.4%).
- *Age:* The questionnaire included an open-ended question addressing the age of the surveyed population (minimum: 16 years; maximum: 93 years; mean: 48.74 years; deviation: 16.98 years). For subsequent analyses, this variable was recoded into the following categories: 16-24 years (10.4%), 25-54 years (51.2%), 55+ years (38.5%).
- *Level of education:* The education variable was measured with eight categories: no formal education (unfinished primary studies; 1.4%); first degree (school certificate, general basic education [GBE] 1st stage, more or less 10 years; 2.2%); second degree, 1st cycle (school diploma, or GBE 2nd stage, 1st and 2nd secondary education [1st cycle], up to 14 years; 11.8%); second degree, 2nd cycle (vocational training 1st and 2nd years, senior high school, Unified Multipurpose Baccalaureate, 3rd and 4th of secondary education [2nd cycle], university orientation course, pre-university studies, 1st and 2nd of high school (39.7%); third degree, 1st cycle (equivalent to technical engineer, 3 years, universities, technical engineers, architect (14.4%); bachelor's degree, 2nd cycle (university-level, higher graduates, colleges, technical universities, etc.; 17.1%); third degree (master's; 11.4%); and third degree (doctorate; 2%). For subsequent analyses, this variable was recoded into the following categories: No formal education (1.4%), Elementary (14%), Secondary and high school (39.7%), and University (44.9%).
- *Class:* The class variable[5] had seven categories: very low (7.6%); low (15.7%); lower middle (12.9%); middle (27.3%); upper middle (12.6%); upper (15.7%); and upper upper (8.2%). For subsequent analyses, this variable was recoded into the following categories: Lower (23.3%), Middle (52.8%), and Upper (23.9%).
- *Ideology:* Respondents were asked to identify where they saw themselves on a 10-point ideological self-placement scale, where 1 meant extreme left and 10 meant extreme right (minimum: 1; maximum: 10; mean: 4.77; deviation: 1.86). For subsequent analyses, this variable was recoded into the following categories: Right (27.2%), Center (31.1%), and Left (41.7%).
- *Self-perceived ability to identify hate speech:* Respondents were asked to indicate to what degree they believed they were able to distinguish derogatory, insulting, or disparaging speech toward a person or group based on their race, sexual orientation, ideology, religion, nationality, ethnicity, etc., in the media and on social networks. This was measured using a 5-point Likert-type scale (where 1 = never and 5 = very much; minimum: 1; maximum: 5; mean: 4.11; deviation: 0.79).
- *Feeling as though hate speech has been directed at you:* The population participating in this study was asked if any derogatory, insulting, or belittling speech they had read or heard on social networks, in the media, or through any other channel felt as though it singled them out or was directed at them. Yes (43%), No (46.8%), or Don't know/prefer not to say (10.2%).
- *Main reason why you felt as though the hate speech was directed at you:* The main reason why these people had felt as though some derogatory, insulting, or belittling speech that they had read or heard on social networks, on the media, or through another channel singled them out or was directed at them (the list of reasons indicated and their response frequencies can be seen in Graph 3).
- *Actions taken in response to hate speech:* Respondents were asked about the frequency, based on a 5-point Likert scale (where 1 = never and 5 = very often) with which they had taken some action when seeing/hearing derogatory, insulting, or belittling speech (the list of items measured and a summary of the mean scores for each item can be found in Table 1).
- *Perceived severity of hate speech:* Respondents were required to rate the intensity of severity that they attributed to 17 real instances of speech extracted from social networks and comments sent to the digital press. The items were selected to represent a variety of groups and apparent intensities of hatred –from derogatory name-calling to explicit reference to acts of violence against groups and individuals. They were measured on a 5-point Likert-type scale (where 1 = not at all serious and 5 = very serious; see Table 2 for the list of items measured and a summary of the mean scores for each item).

- *Attitudes toward hate speech:* Respondents were asked to show their degree of agreement with a series of items in relation to derogatory, insulting, or belittling speech toward a person or group due to their race, sexual orientation, ideology, religion, nationality, ethnicity, etc. They were measured on a 5-point Likert-type scale (where 1 = not at all serious and 5 = very serious; see Table 3 for the list of items measured and a summary of the mean scores for each item).

4. Analysis of results

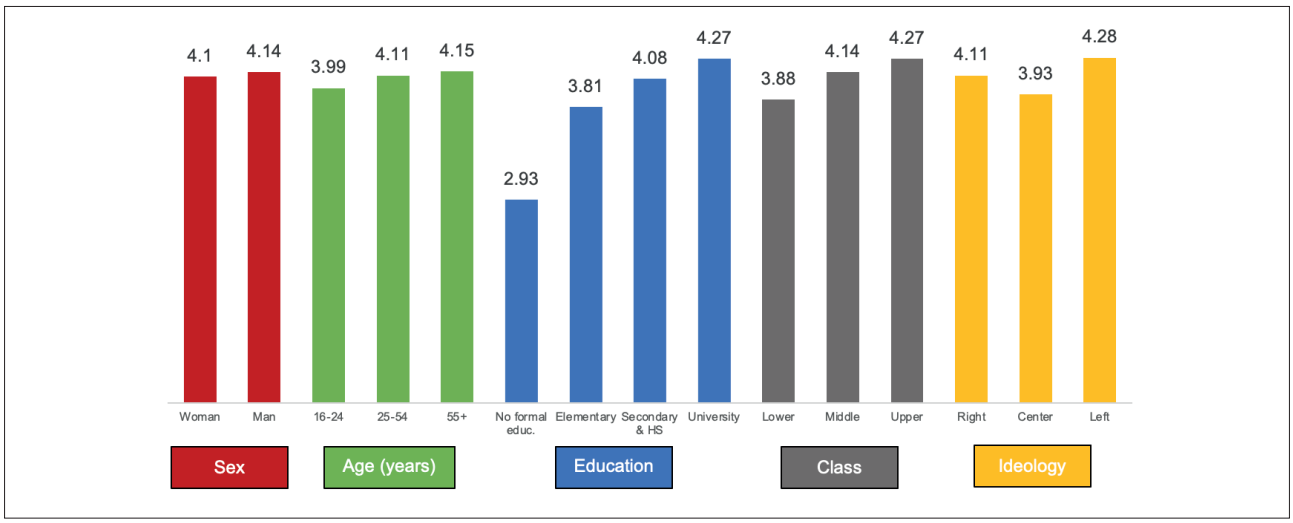
4.1. Opinions and attitudes of the Spanish population toward hate speech on social networks and in digital media

To measure the population's self-rated ability to identify speech that contains hatred or contempt toward groups or individuals, a 5-point Likert-type scale was used (where 1 = not at all and 5 = very much), the results of which showed high self-awareness (mean score: 4.11). However, this perception varied according to some sociodemographic characteristics (Graph 1). People with a higher level of education, higher social class, and left-wing ideology felt more competent at identifying this speech. No significant differences were observed between women and men, or according to age group, unlike the results obtained by other authors (**Kenski**; **Coe**; **Rains**, 2020).

The internet is currently the most significant space, although not the only one, for open and public dissemination of HS by virtue of its accessibility and rapid dissemination owing to the virality's amplifying effect, which can turn a particular comment into a mass phenomenon. In this sense, it is interesting to know where there is a greater presence of hate speech. The overall perception (measured from a Likert scale: 1 = never and 5 = very often) was that such speech frequently occurs in a variety of contexts and media, especially on SNs (mean score: 4.33), followed at some distance by sporting events (matches, for example, 3.87), demonstrations (3.79), and electoral events (3.49). Thus, mass events (recreational or political), which bring together similar people, were identified as places where people dare to openly express their ideas, whereas in the traditional media (television, press, radio), less hate was detected (3.29).

Given that there is a high presence of hate and that it is related to the practices of disseminating and sharing this speech, subjects were asked about the frequency (measured on a Likert scale: 1 = never and 5 = very often) with which people, with whom they maintain different degrees of closeness, perform these actions. A "third-party effect" of sorts was discovered in the responses; that is, respondents believed that people in general (mean score: 3.37) shared and disseminated this speech much more than their acquaintances (2.42), friends (2.17), or relatives (2.03) and, of course, much more than themselves (1.76). In other words, the sharing and spreading of hate in the media and social networks was considered quite natural; although probably for reasons of social desirability, it was recognized to a much lesser extent in oneself. However, it was acknowledged that it is an increasingly common practice: More than 7 out of 10 respondents (72.9%) answered that HS had increased over the last five years, with more than half of the sample stating that it had increased significantly and only around 1 in 10 respondents stating that it had decreased to varying degrees or has remained unchanged.

There was also agreement that there are various groups and individuals who are the target of denigrating and hateful speech. The most common recipients of this type of speech that fosters prejudice and intolerance –if not direct violent attacks– were, in their opinion (measured on a Likert scale from 1 = never to 5 = very often), immigrants (mean score: 4.28) and LGTBIQ+ individuals (4.25), followed by political actors (3.99), women (3.91), and the Roma people (3.88). The groups that, in their view, received hateful comments less frequently were the elderly (3.25), celebrities (3.51), people



Graph 1. Self-perceived ability to identify hate speech –differences according to sociodemographic variables (mean score).
Note: Minimum value 1 and maximum value 5. The difference of means was statistically significant in the variables education, class, and ideology (Anova Sig. F. Fisher <0.05) and not significant in the sex and age groups (Anova Sig. F. Fisher >0.05).

with certain religious beliefs (3.62), people with a physical or mental disability (3.65), and homeless people (3.71). These responses are close to the reality of criminal acts registered in Spain, except in the case of anti-Roma sentiment, which represents a very low percentage of reports (*Ministry of the Interior*, 2021).

In regard to the main reasons why people post this speech, respondents pointed to the writers' upbringing, specifically the rudeness and lack of respect that was also perceived as a widespread theme in today's society (46.6%), but they also mentioned the context, both that of social networks and the political situation, in which this hate speech occurs

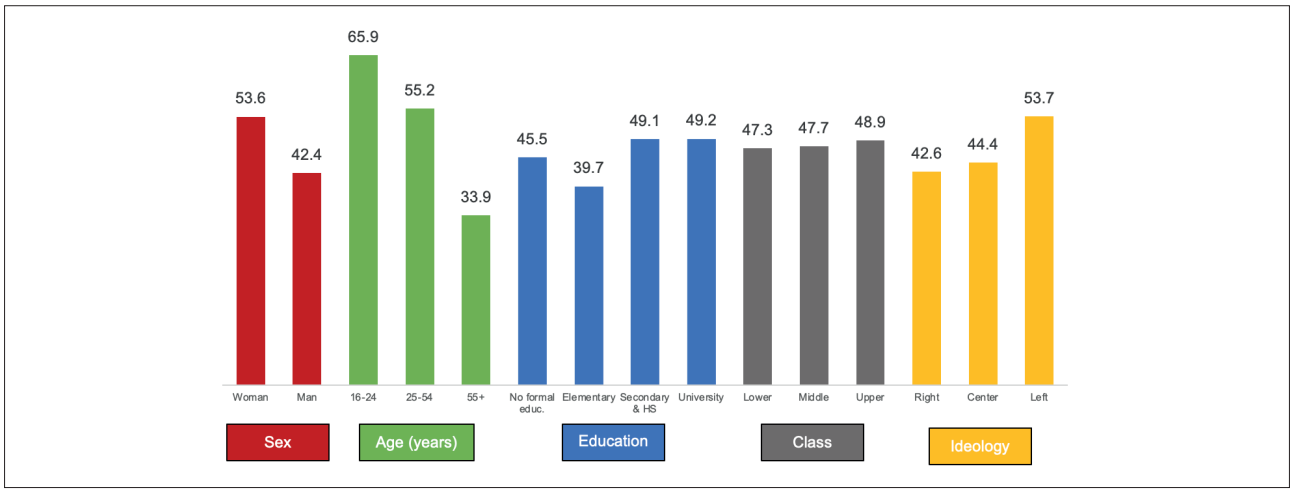
In regard to the main reasons why people post this speech, respondents pointed to the writers' upbringing, specifically the rudeness and lack of respect that was also perceived as a widespread theme in today's society (46.6%), but they also mentioned the context, both that of social networks and the political situation, in which this hate speech occurs. Among the characteristics of social networks, anonymity –which disinhibits this type of behavior– was specifically mentioned (22.2%). Regarding the country, it was believed that a very divided, polarized society such as Spain promotes the proliferation of these messages (10%). However, there was also a portion of the population who took into consideration the perpetrators' objectives and emotional issues, such as doing harm (12%) or letting off steam (3.4%). A minority of respondents saw it as simple fun (2.3%) or even as a strategy to gain more followers on social networks (2.3%).

Given the high presence and seriousness of HS in society, the subjects were invited to take a position on some proposals that could be implemented to change this situation. The responses obtained reflected the existing political and social debate between those who defend freedom of expression and those who believe that speech equals crime, even if there is no direct incitement to violence. Here, although only 4.1% believed that nothing should be done in this respect because it would limit freedom of expression, the majority are indirectly in favor of this right. A total of 53.6% supported the teaching of values in schools, which was also the most frequently mentioned solution among those not explicitly suggested in the questionnaire, which were extracted from the "Other" category that was recoded a posteriori ("education at home," in "values", "promoting culture," and "respect"). Of the respondents, 4.2% were in favor of more general activities such as campaigns to raise social awareness. Those in favor of limiting freedom of expression proposed stricter community standards or guidelines that penalize these practices on social networks (20%), for example, by removing the writer from the social network, through penalties on their account, or by deleting these messages, and 14.1% believed that severe general legislation should be enacted. It is surprising, however, that eliminating anonymity was hardly mentioned as a solution, since this is one of the reasons cited when explaining the presence of hate on SNs and in the media.

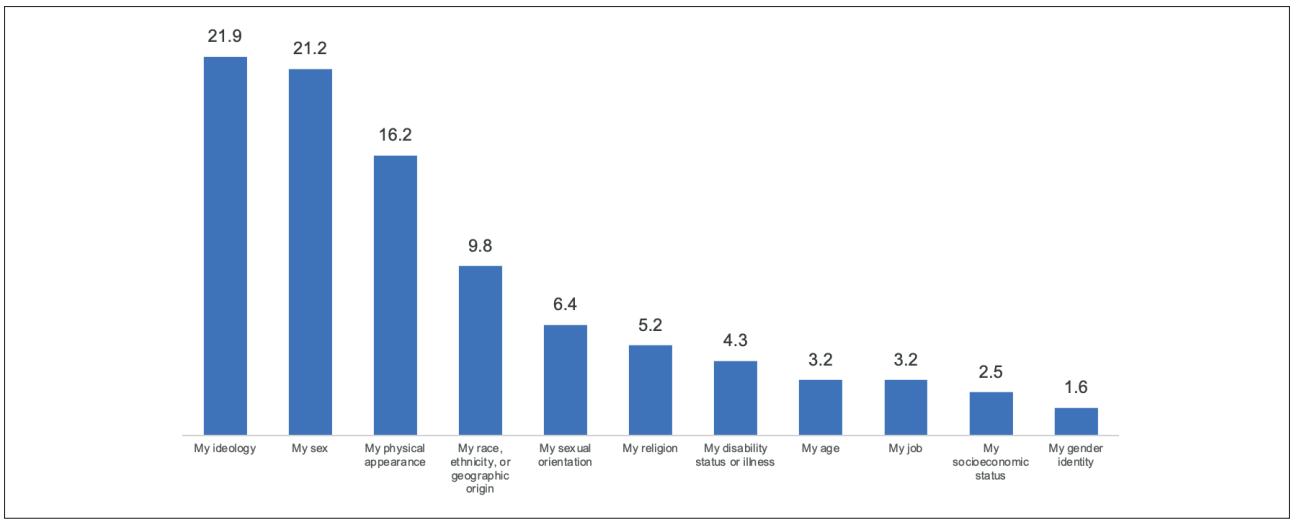
4.2. Being a target of hate speech as a determinant factor

One of the main objectives of this research was to analyze whether having felt that hate speech in the media and social networks was directed at you could influence the perception of and sensitivity to such speech. When respondents were asked about this, 43% of the sample answered that they had felt that some hate speech had been directed at them, 46.8% answered no, and 10.2% answered "I don't know/prefer not to say."

On the basis of an analysis of the relationship between variables using the chi-square statistic (Graph 2), a certain sociodemographic profile can be drawn of those subjects who, at some point, felt that this derogatory speech referred to some of their personal and/or group characteristics. Women, younger people, and those on the left of the ideological scale were more likely to feel that HS had been directed at them; however, their level of education or the social class to which they belonged did not lead to differences in this regard.



Graph 2. Those who have felt that hate speech was directed at them –differences according to sociodemographic variables (percentages).
Note: Association of variables: The result is statistically significant for the variables sex, age, and ideology (chi-square sig. <0.05) and not significant for the variables education and social class (chi-square sig. >0.05).



Graph 3. Main reason you felt that hate speech had been directed at you (percentages)

The main reason for which the subjects reported having felt that this denigrating speech was directed at them was for their ideology, followed closely by their sex and, more distantly, by their physical appearance. Gender identity and socioeconomic status were the least reported reasons (Graph 3).

When it came to understanding whether there were differences in terms of stance, opinions, and attitudes between those who had felt that HS had been directed at them and those who had not, it is interesting to note, first of all, that almost one in five respondents acknowledged that they had sometimes, often, or even very often shared and disseminated this speech, with this being more common among those who felt that they hate speech had been directed at them (24.4%) compared with those who had not felt that it was directed at them (11.3%). Therefore, having felt that hate speech had been directed at oneself increases the practice of disseminating such speech; this practice is not attributable to becoming desensitized to this issue. In contrast to this, the data show, as we will demonstrate below, that these subjects develop a kind of activism in favor of actions that can raise public awareness of HS.

Not only are they more active, but also it was found that having felt as though messages of hate were directed at you at some point increased the self-perceived ability to recognize these expressions, with a mean score of 4.24, compared with 4.05 among those who had not felt as though it had been directed at them (statistically significant difference in means, Anova Sig. F. Fisher <0.001).

Given this proactivity among subjects who felt that hate speech had been directed at them, we confirmed that there were significant differences in how these subjects acted with respect to specific actions, compared with those who had not felt that it had been directed at them (Table 1). For this purpose, a 5-point Likert scale (where 1 = never and 5 = very often) was used based on the following statement: How have you acted upon seeing/hearing derogatory, insulting, or belittling speech? The response items were drawn from previous research (**Hangartner**, *et al*., 2012; **Kunst**; **Porten-Cheé**; **Emmer**, 2021; **Woodzicka** *et al*., 2015, among others).

Table 1. Actions taken against hate speech

	Total population	**Comparison of means between the population who felt that hate speech was directed at them and those who did not**				
	Total (n = 1,022)	Directed at them (n = 439)	Not directed at them (n = 478)	t	p	d
	M (*SD*)	*M* (*SD*)	*M* (*SD*)			
I prefer to stay out of conflicts.	3.25 (1.21)	3.16 (1.19)	3.32 (1.26)	−1.93	0.054	−0.131
I prefer to stay on the sidelines because I do not know how to act in these cases.	2.91 (1.20)	2.90 (1.17)	2.92 (1.26)	−0.31	0.757	−0.016
I have left the social network or media outlet where I saw the comment.	2.84 (1.41)	2.89 (1.41)	2.83 (1.42)	0.67	0.505	0.042
I have replied directly to the person who made the comment.	2.66 (1.16)	2.87 (1.16)	2.48 (1.15)	5.09	0.000	0.338
I have reported it to the manager of the social network, media outlet, etc.	2.24 (1.28)	2.58 (1.38)	1.98 (1.14)	7.19	0.000	0.474

Note: Minimum value 1 and maximum value 5. M, mean; SD, standard deviation.

In response to the question "In general, how have you acted upon seeing/hearing derogatory, insulting, or belittling speech?," the results showed that feeling that hate speech had been directed at you had an influence when it came to being more proactive in terms of the actions taken to confront this type of speech. Statistical significance was found for responding directly to the person who made the comment ($p < 0.001$) and for reporting these practices to the manager or person responsible for the social network or media outlet ($p < 0.001$). It was also marginally significant ($p = 0.054$) for staying on the sidelines to avoid conflict, the most common decision, especially among those who had not felt that this type of speech had been directed at them. In all these cases, the effect size (Cohen's *d*) has a small to moderate magnitude.

> "Women, younger people, and those on the left of the ideological scale were more likely to feel that HS had been directed at them; however, their level of education or the social class to which they belonged did not lead to differences in this regard"

An important dimension in relation to HS is the population's perception of its level of seriousness. To this end, respondents were asked to give their opinion on the degree of severity they attributed to 17 items ($\alpha = 0.93$), measured on a 5-point Likert-type scale (where 1 = not at all serious and 5 = very serious). As mentioned in the Methodology section, the items were selected to represent a variety of groups and apparent intensities of hatred –from derogatory name-calling to explicit reference to acts of violence against groups and individuals (Table 2).

Table 2. Assessment of the seriousness of various instances of hate speech

	Total population	**Comparison of means between the population who felt that hate speech was directed at them and those who did not**				
	Total (*n* = 1,022)	Directed at them (*n* = 439)	Not directed at them (*n* = 478)	*t*	*p*	*d*
	M (SD)	M (SD)	M (SD)			
Do you know how to kill 24 African children at the same time? Throwing a grenade and yelling "apple".	4.71 (0.73)	4.79 (0.65)	4.65 (0.79)	2.98	0.003	0.193
I would make immigrants "mandatory volunteers" for testing new drugs and treatments. Since we have to take care of cast-offs, have them at least do something useful.	4.65 (0.74)	4.76 (0.62)	4.59 (0.79)	3.56	0.000	0.239
The shantytown problem could be fixed with dynamite.	4.61 (0.76)	4.70 (0.71)	4.58 (0.76)	2.48	0.013	0.163
What a slut, whore, moron, and asshole.	4.50 (0.84)	4.62 (0.72)	4.43 (0.89)	3.57	0.000	0.235
My parents are fags, my daughter's a tramp, my wife's stupid (but she's got big boobs), and the other kid I don't know.	4.48 (0.84)	4.66 (0.68)	4.35 (0.91)	5.84	0.000	0.386
The solution to squatters: lock them outside and set them on fire if you are going to end up fixing up the houses anyway.	4.45 (0.94)	4.59 (0.86)	4.38 (0.95)	3.39	0.001	0.237
Be honest, sluts: Everyone wants an African man deep down inside.	4.42 (0.92)	4.52 (0.85)	4.37 (0.96)	2.56	0.011	0.165
Dykes are not right in the head.	4.34 (0.95)	4.51 (0.82)	4.23 (1.03)	4.49	0.000	0.301
Muslims are terrorists.	4.29 (0.95)	4.47 (0.83)	4.16 (1.03)	4.99	0.000	0.331
Faggots are running rampant nowadays.	4.23 (1.04)	4.44 (0.90)	4.09 (1.13)	5.23	0.000	0.343
All the little Spanish mongoloids with little flags and cigars for you, what a bunch of human waste.	4.20 (0.97)	4.25 (0.97)	4.19 (0.98)	0.94	0.348	0.062
When are we going to deport the Islamic and African immigrants?	4.16 (1.06)	4.31 (1.02)	4.05 (1.10)	3.77	0.000	0.245
Voting left is voting for ETA and communists	3.84 (1.22)	4.01 (1.15)	3.76 (1.28)	3.16	0.002	0.205
The neighborhood is full of spics.	3.76 (1.10)	3.95 (1.05)	3.65 (1.14)	4.24	0.000	0.274
Their fellow party member in congress nods like a toy dog on a dashboard.	3.70 (1.19)	3.78 (1.17)	3.64 (1.23)	1.70	0.090	0.117
I believe that the rights of Spaniards should come before those of foreigners.	3.36 (1.34)	3.55 (1.32)	3.21 (1.36)	3.77	0.000	0.254
An old (rightist) right-winger rattling on about rightism.	3.33 (1.21)	3.29 (1.23)	3.37 (1.23)	–1.02	0.308	–0.065

Note: Minimum value 1 and maximum value 5. M, mean; SD, standard deviation.

In general, there is a high degree of awareness and sensitivity with respect to HS, with a high level of seriousness attributed to all these examples of hate speech, especially among those who have felt that hate speech was directed at them. In this sense, statistically significant differences were found in 14 of the 17 items between those who felt that hate speech had been directed at them and those who did not, and the magnitude of the effect size (Cohen's *d*) could be considered small to moderate in all items. In particular, speech referring to immigrants was considered to be very serious, although as we have seen, being an immigrant is not the main reason why people felt that HS had been directed at them. However, derogatory political remarks were perceived as less serious, both among those who felt that hate speech had been directed at them and among those who did not.

> "In particular, speech referring to immigrants was considered to be very serious, although as we have seen, being an immigrant is not the main reason why people felt that HS had been directed at them. However, derogatory political remarks were perceived as less serious, both among those who felt that hate speech had been directed at them and among those who did not"

Therefore, there seems to be a greater sensitivity toward social issues (gender discrimination, discrimination against immigrants, social segregation) than toward the political sphere and its actors; as we have seen, this is the main reason why more than a fifth (21.9%) felt that they had been objects of hate speech. When it came to comparing the rights of nationals with those of migrants, their view was found to be more ambivalent. In concordance with the rationality people showed with respect to their perception of hate speech, greater sensitivity toward more violent speech, which was considered more serious, was observed compared with derogatory appellations ("spics", "right-winger"), which were considered less serious, except in the case of gender-based insults.

Finally, very negative attitudes toward hate speech were noted (Table 3). In particular, the majority agree (measured on a Likert scale: 1 = do not agree at all and 5 = strongly agree) that such expressions harm the people at whom they are directed and also that these behaviors should be condemned. In both cases, these attitudes were stricter among subjects who had felt that hate speech had been directed at them, with higher and statistically significant ($p < 0.001$) means and small to moderate effect sizes (Cohen's *d*). However, there is a lesser degree of agreement that this speech is a reflection of the various opinions in society and that this language is normal on social networks.

This should not be seen as complacency; rather, these responses stem from the respect shown for freedom of expression, as discussed previously, and this is confirmed by the fact that, in these two cases, there are no significant differences ($p > 0.05$) between those subjects who felt that hate speech had been directed at them and those who did not. Meanwhile, a less clear-cut attitude toward the belief that most of these examples of hate speech were truly expressions of hatred –as is commonly held– was observed, with this belief being greater among the subjects who stated that they had not ever felt that hate speech had been directed at them ($p < 0.001$). Perhaps it may be because hate is presented with distinct rhetoric in media, on SNs, and in public environments (metaphors, sarcasm, comical sayings) that may or may not play a part in trivializing this type of speech. In any case, the data obtained showed that humor or irony in this type of speech does not mitigate its derogatory nature, although among those who did not feel that hate speech had been directed at them, there seemed to be more agreement (higher mean and significantly different: $p < 0.05$) on whether this speech could be funny.

Table 3. Attitudes toward hate speech

	Total population	**Comparison of means between the population who felt that hate speech was directed at them and those who did not**				
	Total (*n* = 1,022)	Directed at them (*n* = 439)	Not directed at them (*n* = 478)	*t*	*p*	*d*
	M *(SD)*	*M* *(SD)*	*M* *(SD)*			
These expressions are harmful to the people at whom they are directed.	4.32 (0.93)	4.50 (0.81)	4.23 (0.98)	4.57	0.000	0.300
Such conduct should be condemned.	4.14 (0.99)	4.32 (0.89)	4.02 (1.03)	4.71	0.000	0.312
These expressions are a reflection of the different opinions that exist in society.	3.18 (1.13)	3.15 (1.18)	3.23 (1.09)	–0.95	0.343	–0.068
On social networks, such language is the norm.	2.93 (1.18)	3.02 (1.28)	2.90 (1.15)	1.53	0.125	0.099
I do not believe that most of these examples of such speech are hate, as they are said to be.	2.24 (1.08)	2.04 (1.04)	2.40 (1.11)	–4.98	0.000	–0.335
Some of these statements are very funny.	1.76 (0.97)	1.64 (0.83)	1.81 (1.05)	–2.85	0.004	–0.180

Note: Minimum value 1 and maximum value 5. M, mean; SD, standard deviation.

5. Discussion and conclusions

This research provides data from the Spanish population in general, of which there is little in the scientific literature on HS, where there is an abundance of sector-specific studies in young people (**Kansok-Dusche** *et al*., 2022) or only in relation to certain topics (**Matamoros**; **Farkas**, 2021). It also introduces the feeling of having had hate speech directed at oneself as a discriminating factor in the subject's perception of these practices.

Regarding Q1, the data showed that there was a clear awareness that HS is a growing social problem, contrary to other research (**Soral**; **Bilewicz**; **Winiewski**, 2018). The results are consistent with those published by **Hopkins** and **Washington** (2020), who, far from seeing the normalization of prejudice, confirmed a reinforcement of egalitarian norms, although they limited their study to HS related to race. The population's self-perceived high ability to identify hate speech can be related to some initiatives at the national and international levels to fight this phenomenon (*EU Recommendation 2018/334 of the European Commission*, *The European Union Code of Conduct on Combating Unlawful Incitement to Hatred on the Internet,* among others), with positive results (*European Commission*, 2020), and equally to the cultural permeability of university generations since the sensitivity toward this issue started specifically on campuses around the world. For this reason, the responses highlighted the importance of the respondents' socioeconomic, cultural, and political ideological characteristics, as opposed to the reduced relevance of the variable age (at odds with what **Schmid**, **Kümple**, and **Rieger** (2022) found) and sex.

Regarding Q2, the results indicated that social networks were the main environment for dissemination, and although traditional media are also involved (**Sambaraju**; **McVittie**, 2020), the value accorded to mass gatherings as places of hate is striking. As on social networks, these events promote anonymity and meeting like-minded people. In particular, politicians appeared to be one of the most frequently mentioned groups in messages of hate, and ideology to be one of the causes of feeling that hate speech had been directed at oneself. Undoubtedly, the political polarization generated by the confrontation between a left-wing Spanish government (*PSOE* and *Unidas Podemos*) and the spread of the extreme right (*Vox*) has had an impact on this type of speech, but the seriousness of hate speech against them is recognized regardless of which side it is directed at. This perception is not generally mitigated by a humorous tone, although we discovered a more neutral stance in that not all the subjects surveyed agreed that these examples of hate speech constituted hate.

Regarding measures to control this speech on social networks and in the media, as posed in Q3, the surveyed population mostly rejected legal restrictions that might violate the right to freedom of expression and emphasized the adoption of positive measures that attack the causes of HS, specifically through education, as discussed previously (**Frischlich** *et al*., 2021). These recommendations could be due to the fact that those with a higher educational level perceived themselves to have a higher awareness of HS. It is also possible that the population believed that many of the perpetrators of these messages are young people, and therefore education at school or at home was one of the most supported measures.

This high sensitivity toward HS in media and on SNs, although it is widespread and is determined in part by socioeconomic and cultural variables, can be partially explained by the fact that almost half of the surveyed population has felt that this speech has been aimed directly at them (Q4). Unlike other surveys in which men and younger adults felt more attacked (**Pacheco**; **Melhuish**, 2018), in this study it is evident that, in Spain, women, younger people, and those ideologically situated on the political left consider themselves to be more often attacked by these messages.

Feeling that such speech has been directed at them makes people be more proactive by reporting the facts to the manager of the social network or media outlet and directly replying to people who make hateful comments. The fact that these subjects stated that they have ever shared or frequently share these messages shows that, far from inhibiting their presence on SNs and in the media, they present or assume an upstander rhetoric as a counter-narrative to combat it. However, it is common to choose to stay out of these situations to avoid conflict owing to the social costs of confrontation. Undoubtedly, it is necessary to delve deeper into this question to add nuance for a better understanding of the data and to distinguish which situations or which variables related to the subjects determine proactivity in one direction or the other.

A high dose of rationality is also detected in the perception of the seriousness of hate speech, as people do not seem to be caught up in emotional reactions (e.g., having felt that HS had been directed at them) when making their evaluations. For example, the main reason for identifying with denigrating and disparaging speech was political ideology, but nevertheless this type of speech is not the type that was considered most rigorously. Apart from this widespread rationalization, a certain hierarchy could be observed with respect to the maligned groups. **Woodzicka** *et al*. (2015) note that racist jokes and statements are considered more offensive than sexist ones. Here we see that racist and sexist messages were identified as very serious, especially the latter, possibly due to the campaigns against gender violence carried out by

> Here we see that racist and sexist messages were identified as very serious, especially the latter, possibly due to the campaigns against gender violence carried out by the media and the equality policies undertaken by the leftist government in power in Spain. However, speech against homeless people and squatters was not recognized as hate speech to the same extent

the media and the equality policies undertaken by the leftist government in power in Spain. However, speech against homeless people and squatters was not recognized as hate speech to the same extent, in line with what **Burch** (2018) found regarding people with disabilities. It also shows the connection between policy and HS in the responses obtained. The polarized political context in Spain was seen as conducive to these messages, as was the lack of a democratic culture that respects ideological diversity, but what is most interesting is that, although there is awareness of the seriousness of messages of hate in other areas and toward various groups, as noted, in politics hate speech has become normalized.

"The polarized political context in Spain was seen as conducive to these messages, as was the lack of a democratic culture that respects ideological diversity, but what is most interesting is that, although there is awareness of the seriousness of messages of hate in other areas and toward various groups, as noted, in politics hate speech has become normalized"

This paper presents general data on opinions and attitudes toward HS that are encouraging because of the awareness of the problem, but undoubtedly this is not the same for everyone. The limitations of the study include, in general terms, the possible weakness of the survey as a method for analyzing citizens' perceptions and attitudes, owing to biases such as social desirability, and, specifically, the lack of a context that could modify the results, since respondents were confronted with isolated instances of HS.

In future research, it is necessary to continue advancing and delving deeper into the characteristics of the hate manifested on SNs and in other contexts in relation to user profiles, so as to understand the variables (age, ideological orientation, collective of belonging, etc.) that can contribute to normalizing/proliferating HS, and complete these results by applying other methodologies (in-depth interviews, for example). In addition, it would be interesting to specifically analyze citizens' attitudes about uncivil and hateful political and ideological messages. Finally, research should provide concrete guidelines and practical examples to assess the impact and effectiveness of strategies of educational intervention in the classroom to combat these messages and achieve critical public awareness that prevents the normalization of certain types of radical speech about vulnerable groups and encourages intercultural dialogue, tolerance of diversity, and the development of critical thinking.

6. Notes

1. Formed by nine people with the following profiles:

- 2 women, 20–25 years old, university studies, working;
- 2 men, 30 to 35 years old, university education, working;
- 1 woman, 30–35 years old, higher vocational training, working;
- 1 man, 30–35 years old, secondary school, working;
- 1 woman, 60–65 years old, university education, retired;
- 1 woman, 60–65 years old, no formal education, homemaker;
- 1 man, 60–65 years old, no formal education, retired.

2. The complete questionnaire used in this study is available at **Cáceres-Zapatero**; **Brändle** and **Paz-Rebollo** (2023): *https://doi.org/10.6084/m9.figshare.22656601.v2*

3. The company that was subcontracted for the fieldwork of this research uses a panel of individuals in which one of the criteria established for the final sample selection was compliance with the socioeconomic classification or status set by the EGM. The EGM divides the population into 7 groups based on a series of indicators such as the level of education and profession of the main provider, the main provider's activity, household size, and the number of individuals with income in the household. The final distribution of this variable (referred to as "*Class*" in our study) can be found in Section 3.2 of the text.

4. For interpretative clarity, the category "Other" of the variable "Sex" was discarded for the analyses carried out, given its practically negligible frequency of response in the questionnaire.

5. This variable was not measured directly in the questionnaire; it is data from the panel used by the company in charge of the fieldwork.

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Multi-affiliation: a growing problem of scientific integrity

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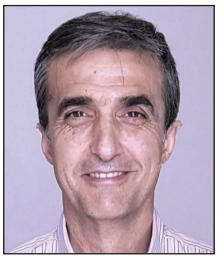

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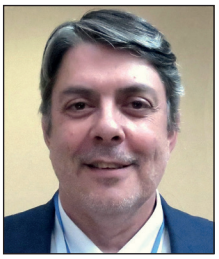

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Abstract

The past decade has witnessed a substantial increase in the number of affiliations listed by individual authors of scientific papers. Some authors now list an astonishing number of institutions, sometimes exceeding 20, 30, or more. This trend raises concerns regarding the genuine scientific contributions these authors make at each institution they claim to be affiliated with. To address this issue, our study conducted a comprehensive regional analysis of the growth of both domestic and international multi-affiliations over the past decade. Our findings reveal certain countries that have experienced an abnormal surge in international multi-affiliation authorships. Coupled with the high numbers of affiliations involved, this emphasizes the need for careful scrutiny of the actual scientific contributions made by these authors and the importance of safeguarding the integrity of scientific output and networks.

Keywords

Multi-affiliation; Authorship; Institutions; Scientific integrity; Scholarly papers; Scientific contributions.

1. Introduction

Multi-affiliation of authors is a phenomenon where authors of a scientific article have multiple affiliations, often from different institutions or organizations. Overall, in recent years there has been a notable increase in the number of authors that have multiple affiliations and in the number of affiliations they hold. A study by Hottenrott *et al.* which covered over 40 million articles and 15 million authors across 40 countries, found that authors with multiple affiliations rose from 10% in 1996 to 16% in 2019 (**Hottenrott**; **Rose**; **Lawson**, 2021).

This phenomenon can be a result of several factors, including the increased complex nature of research which drives collaborations across institutions, whether nationally or internationally (**Gui**; **Liu**; **Du**, 2019; **Sanfilippo**; **Hewitt**; **Mackey**, 2018). A global crisis, such as the COVID-19 pandemic, could also be a driver of large-scale collaborations and as a result an increase in authors having multiple affiliations (**Cai**; **Fry**; **Wagner**, 2021; **Lee**; **Haupt**, 2021). The motivations of authors to belong to more than one affiliation can be driven also for having access to specific networks or funding resources (**Hottenrott**; **Lawson**, 2017; 2022).

While having multiple affiliations is not inherently problematic, it can become an issue when conflicts of interest arise. For example, an author with multiple affiliations may be influenced by the interests of one organization to promote a particular agenda or to downplay certain findings. This can compromise the scientific integrity of the research and raise questions about the accuracy and reliability of the results (**Bachelet** *et al.*, 2019). Another area of concern is compromised ethical behavior especially when authors are paid to be affiliated with an institution to raise its prestige, or when authors try to manipulate the system by adding prestigious affiliations to their name to increase their chances of publication or funding (**Bachelet** *et al.*, 2019; **Bhattacharjee**, 2011).

> "The lack of standardization across publishers and journals of a procedure to require authors to disclose their affiliations and state any conflicts of interest that might arise, has resulted in what has been named "octopus affiliations" where an author lists several affiliations at one time, with which they have insignificant activities"

To address these concerns, both scientific journals and academic institutions are taking practical steps to ensure multiple affiliations are reported ethically and to preserve research integrity. Scientific journals require authors to disclose their affiliations and state any conflicts of interest that might arise from them. This helps increase transparency and accountability in the research process and ensures that readers are aware of any potential conflicts that might influence the research. However, a lack of standardization of this requirement across publishers and journals has resulted in what has been named "octopus affiliations" where an author lists several affiliations at one time, with which they have insignificant activities (**Moustafa**, 2020).

2. Objective

The objective of our study is to draw attention to the increasing trend of authors being affiliated with multiple institutions, both within their country and abroad. Our focus was on the academic affiliations that authors had listed, so that we could demonstrate the extent and scope of this phenomenon within academia.

3. Data and methodology

The data were extracted from *Web of Science Core Collection* on 22nd November 2022, with address unifications from 28th October 2022. The data consists of all editions, including the *Book Citation Indexes* and the *Proceedings Citation Indexes*, but filtered to only include articles and reviews published between 2008 and 2020. Although more than 80% of items in the *Proceedings Indexes* are conference proceedings or meeting abstracts, and so not included in this analysis, many of the rest are articles. In particular, these are predominantly from the physical, chemical and computer sciences. Many items in the *Book Citation Index* include book chapters which are also classified as articles in *Web of Science*, with a particular bias toward the social sciences. This helps to ensure our analysis has applicability to the social sciences as much as to the natural sciences.

Our aim was to tally the affiliations attributed to each author, and extract the highest count for each paper, with a specific emphasis on academic institutions and systems. Although counting the number of addresses linked to each author may appear straightforward, this approach is fraught with several challenges in which a unification of affiliations was needed:

1. Several addresses associated with an author may correspond to a single institution. In this scenario two or more programs or departments in the same institution might be listed. While an author may actually belong to one affiliation, the indexing process for the article may create distinct address entities for each department or program listed.

2. Certain institutions have a hierarchical relationship, such as the campuses of US State universities. Despite an author listing multiple campuses as separate affiliations in their paper, we treated them as a single affiliation due to their shared parent affiliation.

3. Another complication arises when some addresses correspond to multiple independent institutions. This scenario can occur when two academic institutions share a joint institute located at the same address. An illustration of this scenario is the *Harvard-MIT Division of Health Sciences and Technology* in Cambridge, Massachusetts. While this is rightfully affiliated with both *Harvard* and *MIT*, an author listing both it and *Harvard* or *MIT* should be considered as a single affiliation.

4. Conversely, there are cases where an address refers to two distinct unified organizations. One author of a paper listed *Cairo University* and the *German University in Cairo*, both located in Giza, Egypt, in a single address. The author's intention here is unclear. To err on the side of caution, we have adopted a conservative approach where each address is treated as representing a single affiliation.

We addressed these intricate situations with the following algorithm:

1. Each address is represented by a unique identifier based on the given Organization and Country. The rest of the address was ignored, including the city.

2. Each address is also unified to one or more Unified Organizations. These are also represented by a unique identifier linked to the top-most parent in each institutional group. Use of the top-most parent takes care of the parent-child relationship cases.

3. As the Unified Organizations represent the distinct affiliations that we're interested in, we aggregated the unique address IDs associated with each Unified Organization as a set, and then compared these sets to see if they are associated with the same addresses as given by the author. If one such set of address IDs is a subset of another for the same author, we treated them as representing the same affiliation. This takes care of a single address resolving to two distinct Unified Organizations whether through unification, as in case 3 above, or potentially unintentionally, as in case 4.

4. We then count the number of sets of address IDs that remain to give the number of affiliations.

As well as identifying all of the multi-affiliation papers, we also wanted to classify whether the multi-affiliation was international (with affiliations from two or more countries) or intranational (two or more affiliations from the same country). A paper can, of course, be both international and intranational, and, in such cases, be intranational only for some of the countries it is associated with. After processing the data globally, the data were subsequently split by country for further analysis. For this analysis, our final dataset comprised 21 million papers and an aggregate of more than 107 million authors.

4. Findings

Scientific authorship is experiencing a surge in multi-affiliation, particularly on an international scale. The trend is illustrated in Figure 1, which highlights the contrast between intranational and international multiple affiliations among authors. Although there has been a modest increase in intranational multi-affiliations, they have remained relatively consistent compared to international multi-affiliations, which have nearly doubled in just over ten years. Since 2008, intranational multi-affiliations have grown by around 50%, while international multi-affiliations have seen a growth of approximately 100%.

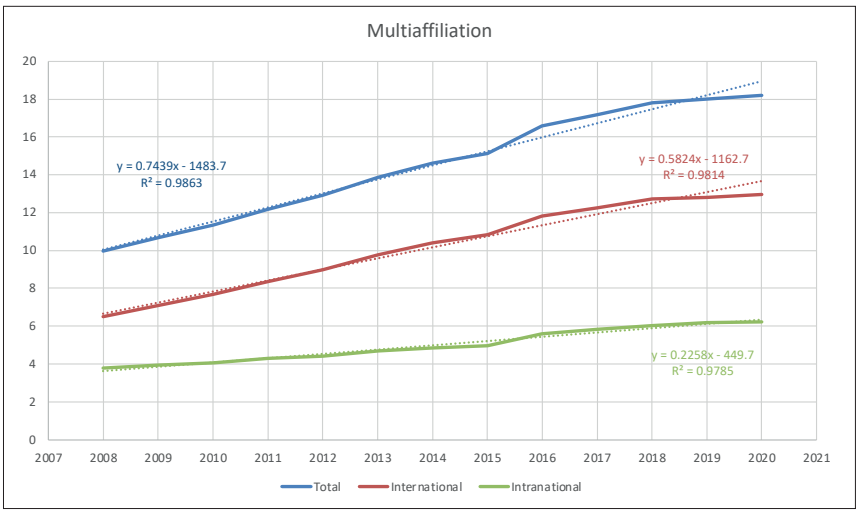

Figure 1. Average weighted by the scientific production of the multi-affiliation percentages of the countries (*WoS* 2008-2020)

These intranational and international multi-affiliation data are not very consistent with those reported by **Hottenrott** *et al.* (2021), in this sense we have to draw attention to the fact that in our study the world production of the University

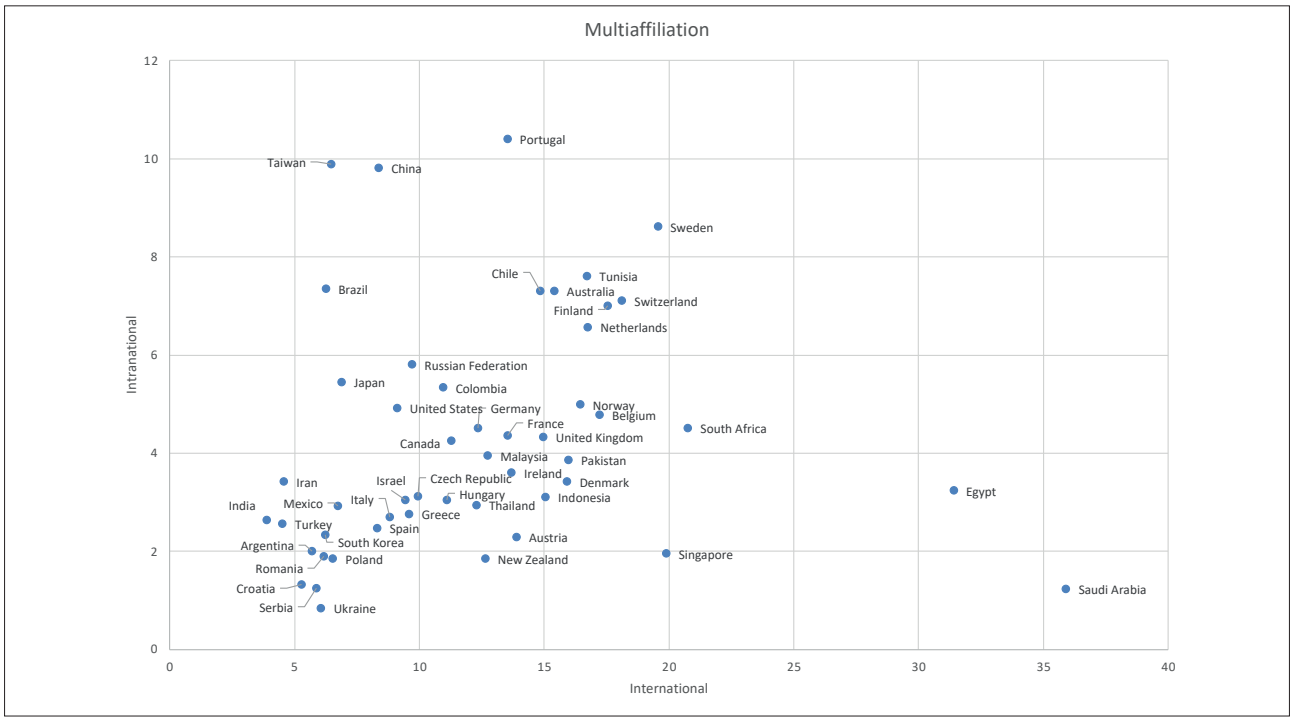

Figure 2. Percentage of international multi-affiliation compared to the percentage of intranational multi-affiliation of the 50 countries with the highest scientific production in the *WoS* in the period 2008-2020

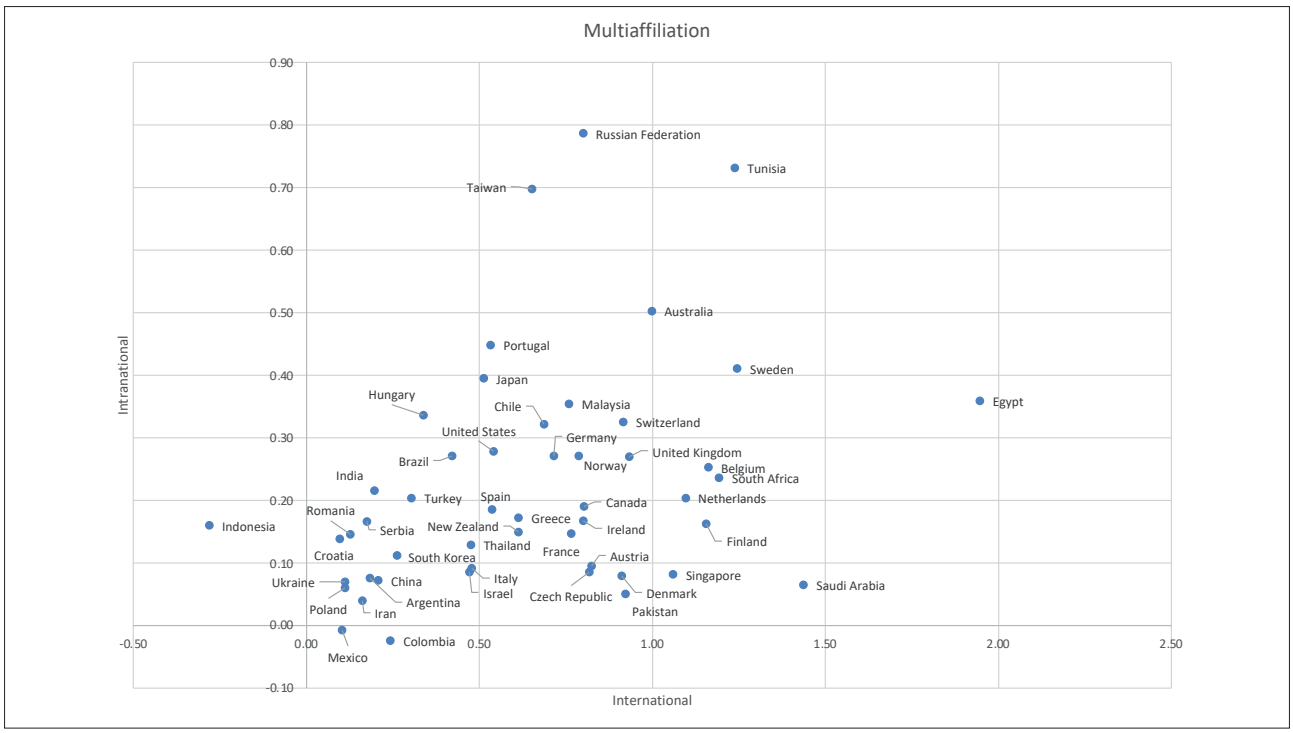

Figure 3. Growth of the percentage of international multi-affiliation (slope of the regression line) compared to the growth of the percentage of intranational multi-affiliation (slope of the regression line) of the 50 countries with the highest scientific production in the *WoS* in the period 2008-2020

sector is analyzed, and above all that, as described in the previous section, a process is carried out to identify affiliations to programs or departments of the same institution or to institutions that share a parent affiliation.

Certain countries such as Egypt and Saudi Arabia exhibit particularly high levels of international multi-affiliation, while Taiwan, China, and Portugal have higher levels of intranational multi-affiliations in comparison. Sweden stands out for having high levels of both international and intranational multi-affiliations (see Figure 2).

Figure 2 also indicates the presence of a distinct group of countries where authors exhibit relatively low levels of both intranational and international multi-affiliations. These include Serbia, Ukraine, Poland, Croatia, Romania, Spain, and South Korea. This could be explained by several reasons. One possibility is that researchers in these countries tend to have a stronger attachment to their primary institutions and may be less likely to establish affiliations with other institutions. Additionally, the funding and incentive structures in these countries may not encourage or reward multi-affiliations, which can result in a lower number of such collaborations. Other factors that may contribute to this pattern could include language barriers, geographic distance, and differences in research culture or priorities between institutions. It's important to note that the reasons for this trend may vary among different countries and would require more specific investigation.

We compared the growth rates of the percentage of international multi-affiliations (based on the slope of the regression line) and the percentage of intranational multi-affiliations (also based on the slope of the regression line) for the period from 2008 to 2020. Figure 3 shows that several countries including Russia, Taiwan and Tunisia demonstrate a high level of growth of intranational multi-affiliations.

This could be attributed to several factors. One possibility is that there has been a greater emphasis on collaboration between institutions within these countries, leading to an increase in intranational multi-affiliations. A good example is Russia which has seen a significant increase in scientific output. Reforms in the science sector and changes to national science policies in Russia have significantly altered the landscape and organization of the country's scientific community, resulting in a notable increase in the number of university faculty members engaged in research and publishing activities nationally and internationally (**Kosyakov**; **Guskov**, 2019). In the case of Taiwan, research has shown that intranational collaboration is relatively more prevalent than international collaboration and that the most common form of collaboration observed is between research institutes and universities (**Liu**; **Chang**; **Chen**, 2012).

Over the next six sections, we provide several examples of countries that exhibit similar trends in terms of both intranational and international multi-affiliations, as well as their overall scientific output.

> For this analysis, our final dataset comprised 21 million papers and an aggregate of more than 107 million authors

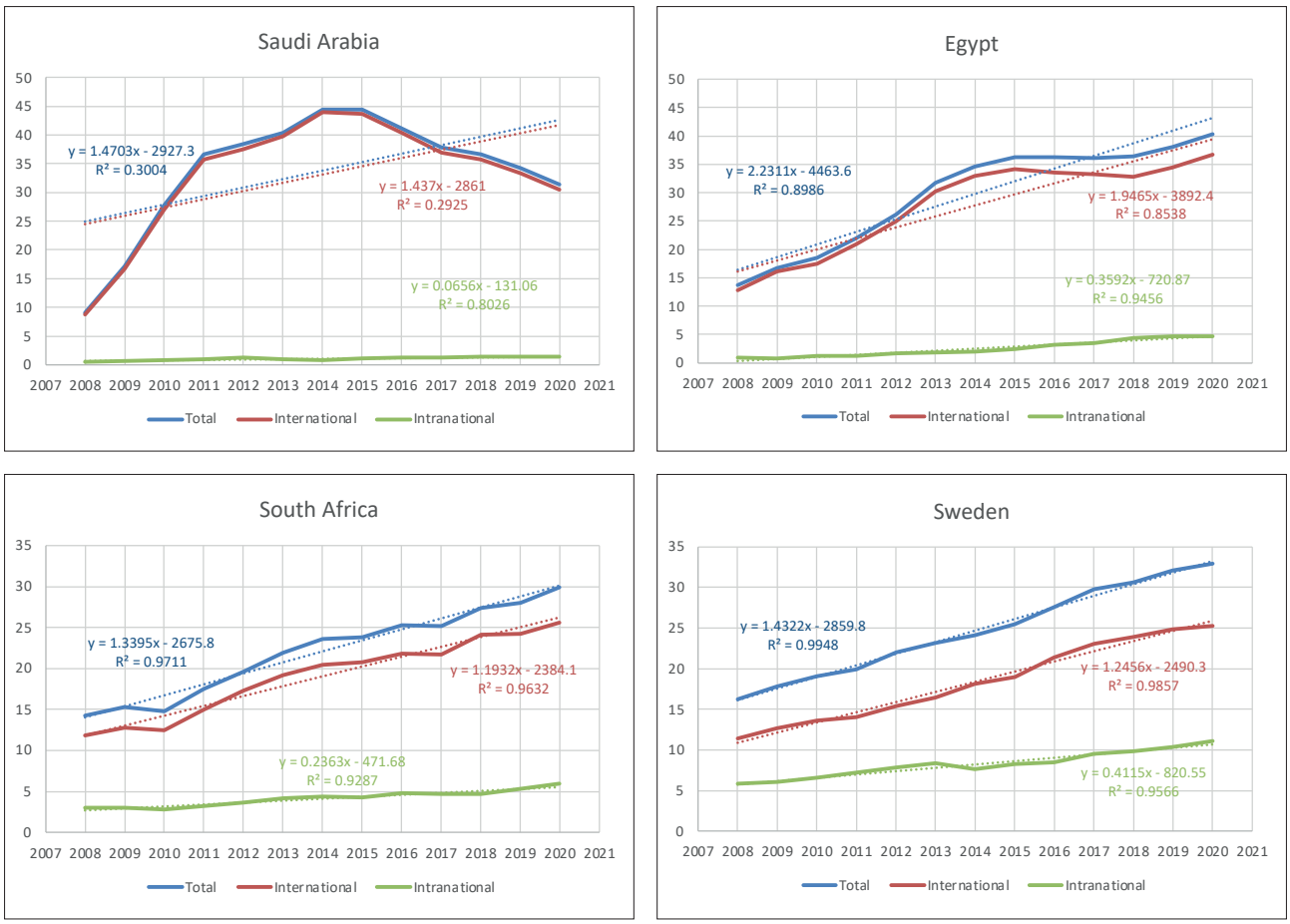

Figure 4. Temporal evolution of the percentages of total, international and intranational multi-affiliation of the countries with the highest percentage (of the 50 countries with the highest scientific production)

4.1. Countries with a high percentage of international multi-affiliations

The first set of countries we examine includes Saudi Arabia, Egypt, South Africa, and Sweden, which display the highest percentage of international multi-affiliations among authors (see Figure 4). Saudi Arabia is particularly noteworthy, as it has experienced a significant growth in its output of international multi-affiliations. In fact, the country experienced an increase by approximately 35 percentage points between 2008 and its peak in 2014, although the percentage has fallen slightly since. Similar trends are observed in Egypt, which has experienced an increase of around 25 percentage points in international multi-affiliations, and South Africa and Sweden, which have both seen increases of around 15 percentage points.

Research conducted by **Landini**, **Malerba** and **Mavilia** (2015) revealed that Northern Africa has experienced an ongoing process of internationalization, leading to an increase in scientific collaborations and research output among international teams. Egypt appears to be the most active country in terms of research output and international collaborations and has become a central hub in the regional research network over time. The increased centrality of Egypt is associated with the growing importance of Saudi Arabia within Egypt's research network, across various research fields and applied science. The study suggests that Northern Africa is undergoing significant changes in the structure and composition of scientific collaborations which could explain the increase in international multi-affiliation authorship. The increase in Saudi international multi-affiliate authorship could also be explained by the finding that some Saudi universities offer cash incentives to faculty members in exchange for academic prestige, such as publishing in high-impact journals or winning prestigious academic awards. This practice has been criticized by some academics and experts who argue that it undermines the integrity of the academic system and creates a culture of incentivized research rather than genuine academic pursuit (**Bhattacharjee**, 2011). In the case of Sweden, a recent article by **Leogrande** *et al.*, shows that Sweden has strong collaborations in Europe where it is a part of a research cluster with Finland, the Netherlands, Austria, Belgium, Cyprus, Norway, Ireland, Luxembourg, United Kingdom, Denmark, and Slovenia which could explain some of the increase in multi-affiliation authorship (**Leogrande** *et al.*, 2022).

> Some Saudi universities offer cash incentives to faculty members in exchange for academic prestige, such as publishing in high-impact journals or winning prestigious academic awards

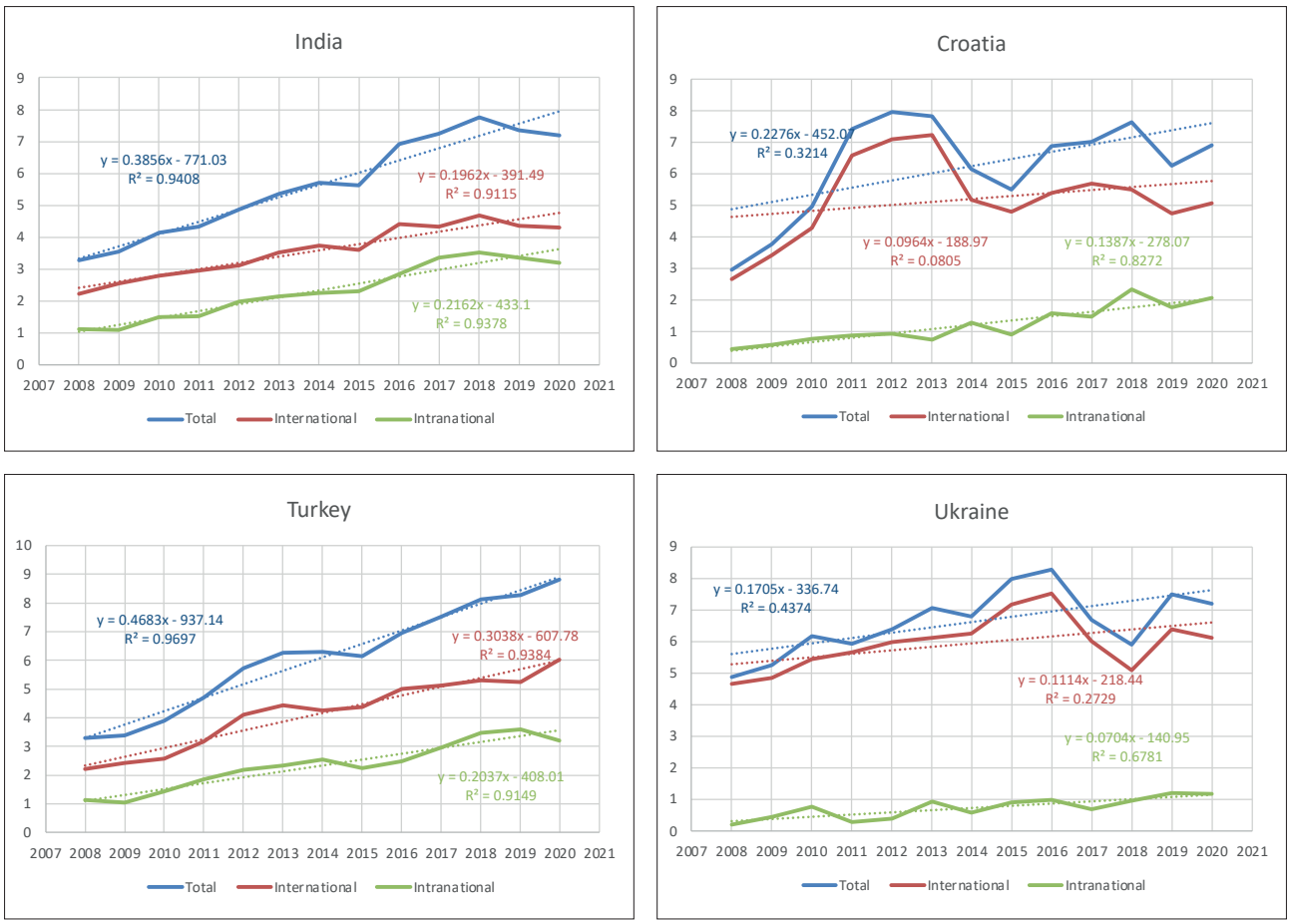

Figure 5. Temporal evolution of the percentages of total, international and intranational multi-affiliation of the countries with the lowest percentage (of the 50 countries with the highest scientific production)

4.2. Countries of low-end multi-affiliation authorships

With the next cluster of countries, we examine instances of low-end multi-affiliation authorships. Figure 5 showcases India, Croatia, Turkey, and Ukraine as the four countries with the lowest total level of multi-affiliation, where we also observe a gradual rise in the number of multi-affiliation authorships. These four countries fall into two main groups, however. Croatia and Ukraine have lower levels of intranational multi-affiliations, a more gradual increase in the growth of such multi-affiliations, and have higher levels of international multi-affiliation authorships compared with Turkey and India. These discrepancies may be attributed to the disparity in the number of scientific institutions within these countries. As per the *Nature Index* (*Institution Tables | Nature Index*, 2017), India is home to 216 scientific institutions, Turkey has 98, while Croatia and Ukraine have 21 and 26 respectively. Due to the relatively limited number of scientific institutions, researchers from Croatia and Ukraine may seek scientific collaborations outside their countries, resulting in a greater number of international multi-affiliations. Compared to Turkey, India demonstrates the least drastic increase in international multi-affiliations authorships.

Despite having a large number of scientific institutions, and an increase in research collaborations with western countries (**Varghese**, 2022), India's relatively less drastic increase in international multi-affiliation authorships could be attributed to several factors. Possible reasons include language barriers, local research priorities, funding limitations, or a preference for working with established local research networks. Additionally, cultural factors, institutional policies, and geographic proximity may also play a role in researchers' inclination to collaborate within the country rather than seeking international affiliations. These factors collectively could contribute to the comparatively slower growth of international multi-affiliation authorships in India.

4.3. Countries that are at the forefront of scientific output

We analyzed the patterns of multi-affiliation authorships in countries that are at the forefront of scientific output. Figure 6 illustrates these trends for the United States, China, United Kingdom, and Germany.

It is noteworthy that China has experienced a slight decline in international multi-affiliations in the last few years, while experiencing an increase in intranational multi-affiliations. In contrast, the United States has been witnessing a gradual rise in international multi-affiliations, which appears to have plateaued over the past four years or so. In contrast to China and the United States, the United Kingdom and Germany are experiencing a significant surge in international multi-affiliations, while their intranational multi-affiliations are increasing more slowly. These findings are in line with previous studies which found similar trends in these countries. **Hottenrott** & **Lawson** (2017; 2022) found that countries and fields with a substan-

Figure 6. Temporal evolution of the percentages of total, international and intranational multi-affiliation of the countries with the highest scientific output

tial non-university research sector tend to have the highest occurrence of cross-sector affiliations. Conversely, countries with a strong international research presence tend to exhibit higher rates of cross-country affiliations.

The occurrence of low cross-sector affiliations combined with limited internationalization, where academic authors primarily affiliate with domestic universities, may be constrained by academic employment contracts that typically impose restrictions on such arrangements (**Hottenrott**; **Lawson**, 2017; 2022).

4.4. Countries with the highest rates of increase in multi-affiliation authorships

Figure 7 presents the countries that exhibit the highest rates of increase in multi-affiliation authorships: Egypt, Tunisia, Russia, and Saudi Arabia. Notably, Saudi Arabia and Egypt both have a substantial disparity between their international and intranational multi-affiliation authorships. While Saudi Arabia's intranational multi-affiliations remain relatively stable, close to 1%, its percentage of international multi-affiliations has undergone a remarkable increase by 35 percentage points between 2008 and 2014. However, a slight downward trend can be observed from 2015 onwards, although the number of international multi-affiliation authorships remains significantly high.

Similar trends to Saudi Arabia are observed in Egypt, where it ranks as the second-largest country in terms of international multi-affiliation authorships, while exhibiting low intranational multi-affiliations. While Tunisia and Russia also demonstrate a large increase in international multi-affiliations, of 15% and 10% respectively over the time period, they also exhibit high levels of growth in their intranational multi-affiliations.

The increase in international multi-affiliations in Tunisia can be attributed to the country's research policies aimed at fostering international research collaborations to enhance its scientific capabilities. Tunisia has signed agreements with several countries to promote scientific cooperation and joint research activities, facilitating the exchange of researchers, knowledge, and resources (*EUR-Lex - 4609295 - EN - EUR-Lex*, n.d.).

In the case of Russia, the rise in international multi-affiliations may be explained by the phenomenon of brain drain. Research by **Subbotin** and **Aref** (2021) indicates that Russia has experienced a significant outflow of specialists across various fields of science between 1996 and 2020. Subfields such as neuroscience, decision sciences, mathematics, biochemistry, pharmacology, chemistry, computer science, chemical engineering, materials science, psychology, medicine, and physics have witnessed a net loss of published researchers (**Subbotin**; **Aref**, 2021).

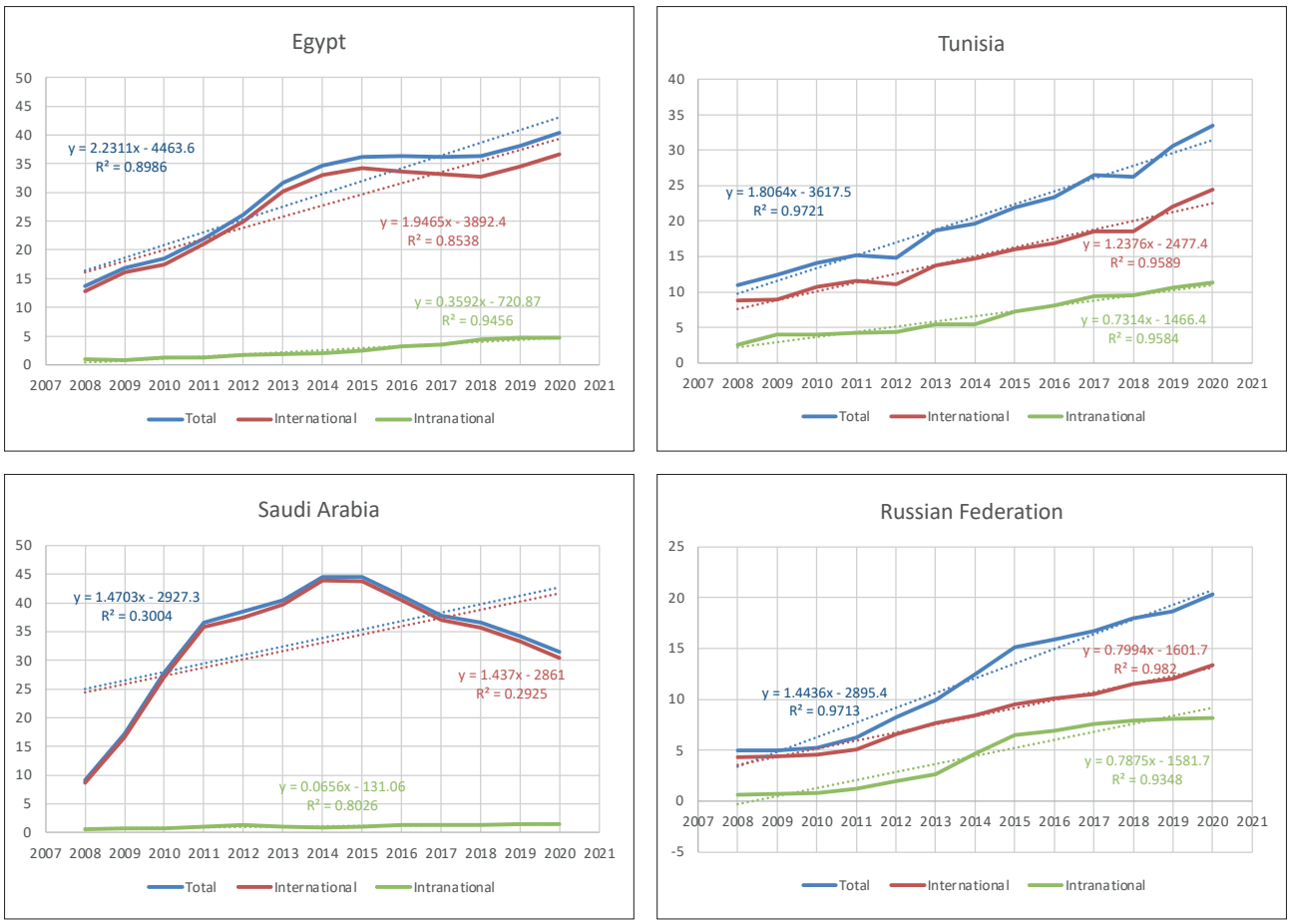

Figure 7. Temporal evolution of the percentages of total, international and intranational multi-affiliation of the countries with the highest multi-affiliation growth (of the 50 countries with the highest scientific production)

4.5. Countries with the lowest growth in multi-affiliate authorships

The four countries with the lowest growth in multi-affiliate authorships are displayed in Figure 8. These include Mexico, Poland, Ukraine, and Iran. A common pattern observed in all four countries is a high proportion of international multi-affiliation authorships coupled with relatively low intranational rates. This is particularly true in the cases of Poland and Ukraine. One possible explanation for this phenomenon could be the relatively lower research output in these countries, which results in a smaller overall number of authors compared to the countries discussed earlier.

In the case of Iran, the relatively low level of international multi-affiliation authorship compared to countries discussed above could be a result of an overall decline in international collaborations. According to a 2019 study by **Sadeh** *et al.* (*The Scientific Output of Iran*, 2019) from 1997 to 2012 there was a continuous decline in the proportion of international collaborations among researchers. However, more recently, starting from 2012 until 2018, there has been a slight upward trend, which can be attributed to the increased presence of Iranians working at universities outside of Iran. Among the papers analyzed, nearly 40% had corresponding authors affiliated with foreign institutions. Half of these authors were scholars who were originally from Iran but are currently employed abroad.

Ukraine is displaying somewhat fluctuating patterns of international multi-affiliations with a peak in 2016 and a dip in 2018 followed by varying numbers of international multi-affiliations since. This could be a result of an overall problematic scientific landscape in the country. According to the *OECD*, in the years leading up to the Russian aggression against Ukraine, the field of science and research in Ukraine underwent a period of transition, characterized by significant structural changes in response to substantial budgetary pressures. The domestic expenditure on research and development (R&D) as a percentage of GDP experienced a decline of approximately one-third between 2013 and 2018. Furthermore, the number of researchers decreased from over 52,000 full-time equivalents in 2013 to 41,000 in 2018. This shift was primarily driven by a sharp decline in the number of researchers employed in business and government institutions (*OECD*, 2022).

The relatively low international multi-affiliations in Poland compared to previously discussed countries could be attributed to the significant scientific brain drain the country experienced in the past decade (**Czerniawska** *et al.*, n. d.). With many highly skilled researchers and scientists leaving the country for better career opportunities abroad, this brain drain has been a cause of concern for the Polish scientific community and the government. According to a report by *OP-Europa*, one of the main factors contributing to this migration is the relatively low salaries and limited career prospects for

Figure 8. Temporal evolution of the percentages of total, international and intranational multi-affiliation of the countries with the lowest growth of multi-affiliation (of the 50 countries with the highest scientific production)

researchers compared to other European countries (*European Commission*, *Directorate General for Education, Youth, Sport and Culture*, 2021). Many Polish scientists, particularly those in the fields of science, technology, engineering, and mathematics (STEM), are attracted to better-funded research institutions and universities in countries such as Germany, the United Kingdom, and the United States.

The same is true for Mexico where limited funding, career prospects and concerns about security, political stability, and quality of life, may influence scientists' decisions to emigrate and thus be affiliated with their country of residence. Another interesting observation made by **Gómez-Flores** *et al.* (2022) while studying the Mexican scientific diaspora was that their surveyed respondents indicated a lack of institutional follow-up on successful collaborations between Mexican and foreign institutions, both in Mexico and abroad. This situation creates challenges for fostering effective collaboration and establishing sustainable community change through coalitions (**Gómez-Flores** *et al.*, 2022).

4.6. The four largest scientific producers in South America

Our last set of observations focuses on the four largest scientific producers in South America, Brazil, Argentina, Chile, and Colombia. In general, there is a noticeable upward trend in international multi-affiliation authorship across all four countries, as depicted in Figure 9. For instance, Chile and Colombia start with around 9% affiliations each, in 2008, and gradually increase to approximately 16% and 12% by 2020. However, the levels of intranational multi-affiliation are much flatter in the four countries, particularly for Argentina and Colombia, with lower levels of growth.

Along with China, Brazil is one of the few countries to display a higher level of intranational multi-affiliation than international. Although the reason behind this trend cannot be revealed by the data, perhaps the language barrier and the large size of these countries may push national multi-affiliation. And in Brazil's case, it could be in part a result of the establishment of the *REAL* scientific collaboration network in 1994 which facilitated more intranational multi-affiliation authorships. The *REAL* scientific collaboration network involves numerous institutions, universities, research centers, and individual researchers across various disciplines. These collaborations contribute to advancing scientific knowledge, promoting innovation, and addressing societal challenges. Within Brazil, scientific collaboration networks are often facilitated by national funding agencies, research organizations, and academic networks. These entities provide support and resources to foster collaborations and promote interdisciplinary research (**Haddad**; **Mena-Chalco**; **Sidone**, 2017).

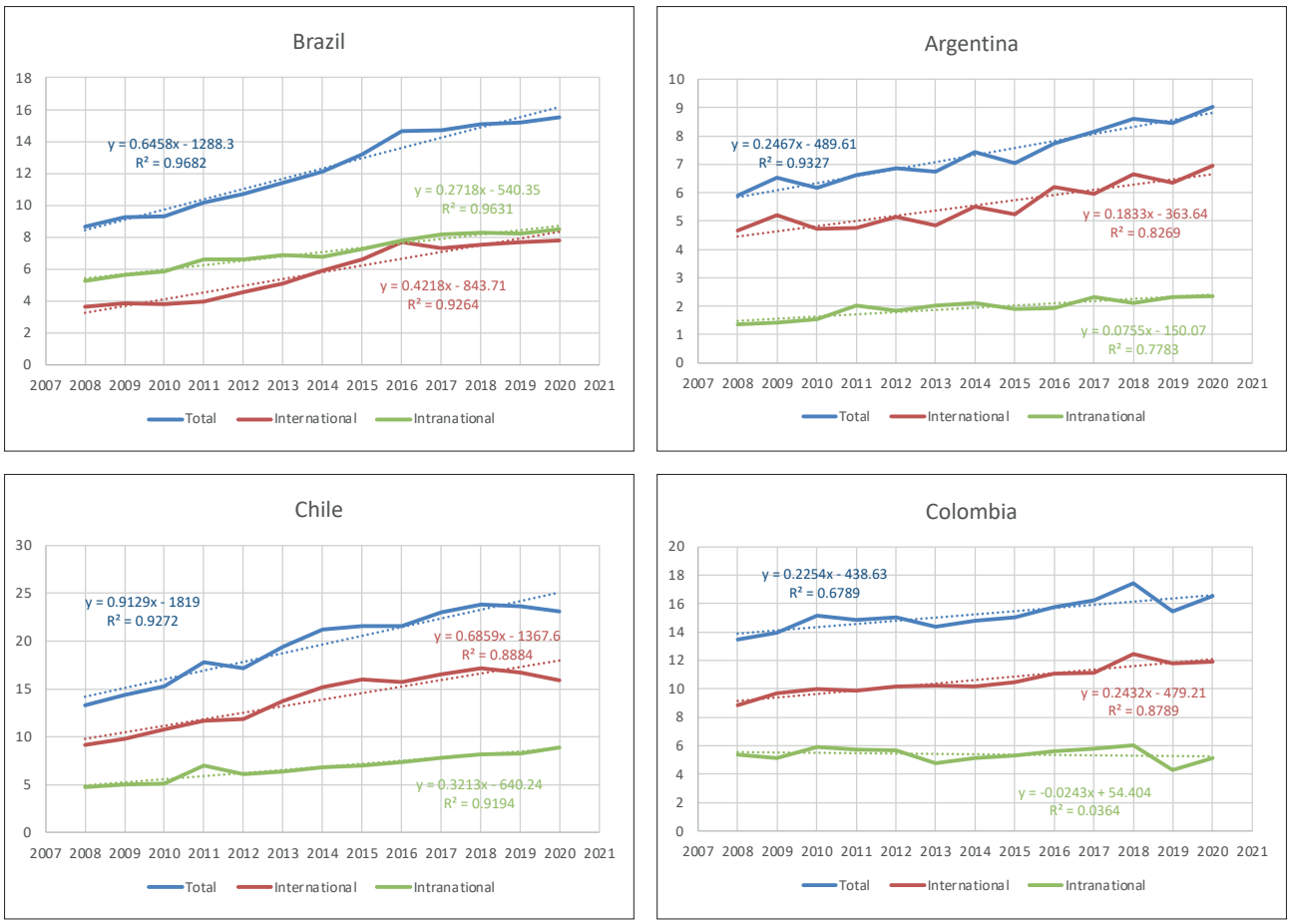

Figure 9. Temporal evolution of the percentages of total, international and intranational multi-affiliation of the 4 South American countries included within the 50 countries with the highest scientific production

5. Discussion and conclusions

The prevalence of authors displaying multi-affiliations has significantly increased over the past decade. Multiple affiliations can be attributed to various factors. One such factor is the implementation of scientific policies by governments that encourage scientists to expand their international presence by establishing foreign affiliations through research collaborations. The growing trend of collaborative research further contributes to researchers forming partnerships with colleagues from diverse institutions or disciplines. By holding multiple affiliations, researchers can foster collaboration and gain access to resources available at different institutions. Another motivating factor for researchers to pursue multiple affiliations is funding. They may seek affiliations with various institutions or organizations to secure funding from different sources, particularly for specific projects or research areas. Such multiple affiliations enable researchers to leverage a broader range of resources, thereby enhancing their research capabilities. Additionally, the desire to broaden professional networks and maintain geographic flexibility can also drive researchers towards adopting multiple affiliations. This enables them to engage with a wider array of collaborators, mentors, and colleagues, fostering professional growth. Lastly, personal reasons may contribute to researchers opting for multiple affiliations, such as accommodating family commitments or aligning with personal preferences. In such cases, researchers may choose affiliations with institutions that cater to their individual needs or resonate with their values.

While the aforementioned reasons and motivations provide valid justifications for researchers having multiple affiliations, it is worth noting that there are also less reputable factors at play. These include instances where institutions offer monetary incentives to renowned researchers as a means to boost their rankings or prestige. Researchers may opt to associate themselves with multiple affiliations to enhance their personal prestige without making substantial contributions to their research or collaborative efforts. This phenomenon, commonly referred to as "octopus affiliations," involves researchers strategically accumulating affiliations primarily for the purpose of bolstering their reputation. Additionally, some researchers may engage in practices where they exploit the funding or resources available through multiple affiliations to advance their own career. This can include gaming the system to secure additional funding or accessing resources from different affiliations without fulfilling the expected level of contribution or collabo-

> "Universities should establish comprehensive policies and procedures to effectively manage situations involving multiple affiliations among faculty members"

ration. Such actions prioritize personal gain and career advancement over the ethical and equitable utilization of funding and resources.

> This study draws attention to various groups of countries, some of which have experienced a concerning rise in the occurrence of multiple affiliations, particularly those involving foreign affiliations

This study draws attention to various groups of countries, some of which have experienced a concerning rise in the occurrence of multiple affiliations, particularly those involving foreign affiliations. It is crucial to closely monitor these trends and take appropriate measures. It is essential to maintain a robust system of checks and balances to safeguard against any potential issues that may arise from such affiliations. Recent news from Spain where one of the country's most prominent scientists was suspended by his university for 13 years comes to mind. In this case the university found that Luque had falsely claimed affiliations with a Russian and a Saudi Arabian university while holding a full-time contract with *Universidad de Córdoba* (**Ansede**, 2023). The suspension raises questions about the integrity of research affiliations and the consequences of such misconduct.

Our recommendation is for universities, where researchers maintain primary affiliations, to conduct rigorous examinations of each researcher's affiliations to ensure that they adhere to legal, ethical, and legitimate standards. Universities should establish comprehensive policies and procedures to effectively manage situations involving multiple affiliations among faculty members. Furthermore, it is essential for universities to enforce the requirement of full disclosure of all affiliations and potential conflicts of interest when researchers publish their work or engage in scholarly activities. This ensures transparency and accountability, preventing the inclusion of institutions without genuine contributions. Moreover, universities should prioritize providing education and training to faculty members on responsible research practices and the proper management of conflicts of interest. By implementing these measures, institutions can uphold the integrity of research and safeguard against unethical practices.

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7. Appendix A

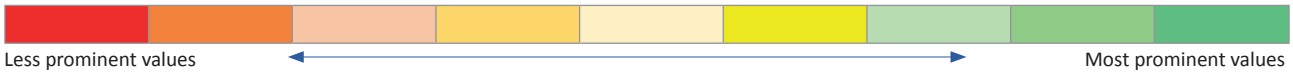
Table 1. Scientific output, percentage, slope and coefficient of determination of the regression line of the percentages of total, international and intranational multi-affiliation, of the countries with more than 2000 documents in the study period (*WoS*, 2008-2020)

Multiaffiliation		Total			International			Intranational		
Country	Output	%	m	R^2	%	m	R^2	%	m	R^2
United States	4,961,301	13.28	0.75	0.96	9.11	0.54	0.96	4.92	0.28	0.89
China	3,483,549	17.48	0.23	0.87	8.37	0.21	0.77	9.82	0.07	0.31
United Kingdom	1,540,631	18.26	1.11	0.99	14.96	0.93	0.99	4.33	0.27	0.97
Germany	1,147,352	16.02	0.91	0.99	12.36	0.71	0.99	4.52	0.27	0.97
Japan	960,595	11.77	0.85	0.97	6.88	0.51	0.98	5.45	0.39	0.94
Canada	898,951	14.86	0.93	0.98	11.29	0.80	0.98	4.26	0.19	0.96
France	832,500	17.24	0.86	0.97	13.55	0.77	0.97	4.36	0.15	0.75
Italy	804,979	11.02	0.53	0.98	8.81	0.48	0.98	2.70	0.09	0.91
Australia	796,558	21.36	1.36	0.99	15.40	1.00	0.99	7.31	0.50	0.98
India	725,060	6.21	0.39	0.94	3.87	0.20	0.91	2.64	0.22	0.94
Spain	709,124	10.37	0.68	0.99	8.31	0.54	0.98	2.47	0.19	0.97
South Korea	699,281	8.32	0.35	0.91	6.23	0.26	0.80	2.35	0.11	0.88
Brazil	633,017	12.98	0.65	0.97	6.24	0.42	0.93	7.35	0.27	0.96
Netherlands	487,077	22.05	1.17	0.99	16.75	1.10	0.99	6.57	0.20	0.94
Iran	422,110	7.76	0.18	0.73	4.57	0.16	0.71	3.42	0.04	0.35
Turkey	401,840	6.64	0.47	0.97	4.52	0.30	0.94	2.57	0.20	0.91
Russian Federation	347,705	14.56	1.44	0.97	9.70	0.80	0.98	5.82	0.79	0.93
Sweden	343,921	26.03	1.43	0.99	19.55	1.25	0.99	8.63	0.41	0.96
Taiwan	329,564	15.54	1.22	0.98	6.47	0.65	0.88	9.89	0.70	0.99
Poland	317,052	8.22	0.15	0.64	6.54	0.11	0.47	1.86	0.06	0.58
Switzerland	315,819	23.57	1.11	0.98	18.11	0.92	0.97	7.11	0.33	0.93
Belgium	259,859	20.98	1.31	0.99	17.22	1.16	0.99	4.78	0.25	0.88
Denmark	220,938	18.72	0.95	0.99	15.92	0.91	0.98	3.43	0.08	0.68
South Africa	188,244	24.02	1.34	0.97	20.76	1.19	0.96	4.51	0.24	0.93
Portugal	186,532	22.68	0.88	0.91	13.52	0.53	0.85	10.40	0.45	0.92
Israel	180,817	12.19	0.54	0.95	9.45	0.47	0.96	3.05	0.09	0.68
Austria	171,450	15.75	0.88	0.99	13.89	0.82	1.00	2.29	0.10	0.74
Malaysia	168,329	16.29	1.06	0.76	12.74	0.76	0.66	3.95	0.35	0.92
Mexico	166,666	9.38	0.09	0.46	6.73	0.10	0.64	2.93	-0.01	0.02
Saudi Arabia	164,493	36.74	1.47	0.30	35.91	1.44	0.29	1.23	0.07	0.80
Finland	161,698	22.93	1.21	0.99	17.55	1.16	0.99	7.01	0.16	0.83
Norway	158,577	20.41	0.96	0.97	16.44	0.79	0.96	5.00	0.27	0.92
Singapore	147,310	21.31	1.08	0.97	19.89	1.06	0.97	1.95	0.08	0.89
Egypt	140,935	34.01	2.23	0.90	31.40	1.95	0.85	3.25	0.36	0.95
Greece	140,459	11.82	0.73	0.92	9.59	0.61	0.89	2.77	0.17	0.86
Czech Republic	130,778	12.73	0.85	0.94	9.94	0.82	0.95	3.13	0.09	0.60
Pakistan	119,863	19.22	0.96	0.63	15.97	0.92	0.71	3.86	0.05	0.06
New Zealand	117,322	14.10	0.73	0.96	12.64	0.61	0.94	1.86	0.15	0.93
Ireland	111,583	16.65	0.90	0.98	13.69	0.80	0.98	3.61	0.17	0.88
Chile	104,938	20.95	0.91	0.93	14.85	0.69	0.89	7.31	0.32	0.92
Thailand	104,211	14.89	0.58	0.87	12.28	0.48	0.88	2.94	0.13	0.63
Argentina	103,180	7.51	0.25	0.93	5.68	0.18	0.83	2.00	0.08	0.78
Romania	95,714	7.93	0.26	0.81	6.16	0.13	0.49	1.90	0.15	0.77
Colombia	76,086	15.56	0.23	0.68	10.95	0.24	0.88	5.35	-0.02	0.04
Hungary	71,872	13.68	0.62	0.90	11.09	0.34	0.85	3.05	0.34	0.93

Multiaffiliation		Total			International			Intranational		
Country	Output	%	m	R^2	%	m	R^2	%	m	R^2
Serbia	63,013	7.01	0.32	0.88	5.87	0.18	0.74	1.24	0.17	0.88
Ukraine	56,693	6.82	0.17	0.44	6.06	0.11	0.27	0.84	0.07	0.68
Tunisia	50,650	23.01	1.81	0.97	16.71	1.24	0.96	7.61	0.73	0.96
Croatia	48,443	6.45	0.23	0.32	5.29	0.10	0.08	1.33	0.14	0.83
Indonesia	48,399	17.97	-0.13	0.03	15.06	-0.28	0.13	3.11	0.16	0.78
Slovakia	42,637	10.28	0.26	0.55	8.82	0.22	0.50	1.61	0.04	0.18
Slovenia	40,561	8.28	0.34	0.79	6.24	0.28	0.76	2.16	0.08	0.36
Viet Nam	39,920	26.14	0.51	0.19	23.92	0.28	0.07	2.62	0.27	0.88
Nigeria	38,951	13.78	1.30	0.96	12.79	1.24	0.96	1.21	0.07	0.55
Bulgaria	37,805	9.76	0.11	0.15	7.10	-0.11	0.26	2.91	0.25	0.77
Algeria	37,430	16.59	0.51	0.84	9.33	-0.08	0.11	8.09	0.64	0.90
Morocco	32,433	14.25	0.38	0.68	10.01	-0.06	0.09	4.79	0.51	0.88
Lithuania	28,419	8.59	0.38	0.85	6.20	0.40	0.79	2.55	-0.01	0.01
United Arab Emirates	26,308	21.36	1.05	0.94	21.11	1.03	0.93	0.33	0.04	0.64
Jordan	24,191	13.06	1.03	0.90	12.19	1.02	0.90	1.04	0.04	0.16
Bangladesh	23,597	25.27	1.18	0.85	23.35	1.00	0.78	2.34	0.22	0.75
Estonia	22,700	19.66	1.35	0.97	17.88	1.45	0.98	2.10	-0.07	0.53
Iraq	22,277	26.43	2.22	0.55	25.41	2.10	0.50	1.18	0.12	0.44
Ethiopia	18,331	21.77	0.34	0.19	19.84	0.24	0.11	2.59	0.13	0.51
Lebanon	17,927	19.93	1.45	0.77	18.71	1.35	0.73	1.62	0.15	0.62
Qatar	17,907	23.56	-0.37	0.20	23.21	-0.42	0.23	0.78	0.10	0.52
Philippines	16,159	18.25	0.48	0.66	15.35	0.32	0.40	3.35	0.18	0.36
Peru	15,828	20.23	0.20	0.13	17.05	0.14	0.07	3.97	0.11	0.19
Cyprus	14,512	13.81	0.55	0.80	12.95	0.46	0.68	1.07	0.10	0.45
Kazakhstan	14,500	15.19	1.07	0.80	12.10	0.67	0.66	3.62	0.48	0.87
Ghana	13,766	16.27	0.59	0.67	15.57	0.51	0.63	0.81	0.09	0.70
Uruguay	12,782	10.46	0.03	0.01	9.95	0.04	0.02	0.61	-0.01	0.00
Iceland	12,227	23.10	0.93	0.68	22.35	0.98	0.71	1.02	-0.05	0.19
Belarus	11,035	7.51	0.70	0.79	7.29	0.67	0.78	0.28	0.03	0.17
Kenya	10,935	19.02	0.39	0.30	17.82	0.28	0.18	1.63	0.14	0.47
Sri Lanka	10,884	22.76	1.04	0.49	21.04	0.83	0.38	2.46	0.25	0.92
Venezuela	10,763	13.43	1.03	0.92	12.51	1.09	0.95	1.16	-0.05	0.18
Ecuador	10,492	23.78	0.59	0.38	22.71	0.54	0.39	1.55	0.09	0.28
Latvia	10,116	10.98	0.37	0.35	8.07	0.35	0.38	3.17	0.07	0.14
Costa Rica	10,020	16.67	1.03	0.89	14.80	0.95	0.88	2.05	0.10	0.29
Uganda	9,712	21.09	0.05	0.01	20.20	0.04	0.00	1.16	-0.02	0.02
Kuwait	9,496	9.53	0.79	0.88	9.48	0.79	0.88	0.07	0.00	0.03
Oman	8,980	16.47	0.95	0.82	16.41	0.95	0.81	0.07	0.01	0.16
Cuba	7,943	12.27	-0.10	0.08	12.07	-0.13	0.11	0.25	0.02	0.22
Armenia	7,636	12.07	-0.12	0.07	10.03	0.00	0.00	2.71	-0.18	0.40
Georgia	6,684	28.65	2.35	0.65	12.75	0.16	0.03	17.09	2.35	0.61
Luxembourg	6,643	21.69	0.33	0.16	21.68	0.32	0.16	0.02	0.00	0.05
Cameroon	6,211	18.26	0.10	0.02	18.16	0.08	0.01	0.13	0.03	0.59
Bosnia And Herzegovina	6,205	6.24	0.11	0.13	6.11	0.10	0.12	0.18	0.00	0.00
Tanzania	6,040	22.48	0.86	0.72	21.56	0.69	0.65	1.36	0.23	0.73
Nepal	4,729	16.60	-0.36	0.14	16.35	-0.39	0.16	0.27	0.03	0.27
Azerbaijan	4,420	14.91	1.03	0.74	13.39	0.80	0.59	1.63	0.25	0.60

Multiaffiliation		Total			International			Intranational		
Country	Output	%	m	R^2	%	m	R^2	%	m	R^2
Macedonia	4,024	8.20	0.07	0.02	6.66	-0.16	0.09	1.59	0.22	0.76
Malta	3,943	14.79	0.49	0.24	14.79	0.49	0.24	0.00	0.00	0.00
Moldova	3,818	18.94	0.02	0.00	16.63	0.11	0.02	3.27	-0.01	0.00
Malawi	3,783	37.91	1.12	0.59	37.75	1.14	0.57	0.24	-0.01	0.02
Zimbabwe	3,555	17.58	0.12	0.02	17.38	0.10	0.01	0.45	0.04	0.12
Trinidad And Tobago	3,146	8.14	-0.11	0.03	8.11	-0.11	0.04	0.03	0.01	0.15
Jamaica	3,077	6.66	0.76	0.76	6.53	0.73	0.78	0.16	0.03	0.12
Montenegro	3,018	4.57	0.41	0.33	4.51	0.41	0.34	0.07	0.00	0.01
Botswana	2,908	16.85	1.11	0.51	16.82	1.10	0.50	0.07	0.01	0.05
Zambia	2,900	30.62	1.34	0.43	30.48	1.33	0.43	0.17	0.02	0.10
Senegal	2,867	18.10	0.67	0.40	17.65	0.64	0.39	0.49	0.03	0.13
Mongolia	2,858	19.07	0.83	0.49	16.66	1.25	0.69	2.59	-0.40	0.37
Bahrain	2,828	14.75	0.02	0.00	14.43	-0.02	0.00	0.32	0.05	0.22
Sudan	2,774	28.05	2.71	0.92	27.97	2.69	0.92	0.18	0.04	0.34
Brunei Darussalam	2,458	21.16	0.87	0.22	20.91	0.84	0.22	0.41	0.05	0.23
Palestine	2,311	23.89	1.74	0.54	23.50	1.69	0.52	0.43	0.05	0.51
Benin	2,297	22.07	0.30	0.18	21.94	0.27	0.15	0.13	0.03	0.27
Fiji	2,132	24.62	0.72	0.43	23.55	0.62	0.32	1.78	0.23	0.61
Uzbekistan	2,074	12.63	0.74	0.41	10.08	0.45	0.21	2.84	0.33	0.34

Note: Color code for each column



Less prominent values ⟷ Most prominent values

Mapping open science at Spanish universities. Analysis of higher education systems

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Abstract

This study analyzes the implementation of open science in Spanish universities considering four perspectives: (i) regulations, policies, and strategies; (ii) knowledge production; (iii) research results; and (iv) perception by different academic actors. A qualitative and quantitative methodology is applied, drawing information from university websites, institutional reports, European project databases (*Cordis*), the *Web of Science* database, surveys of teaching and research staff, and surveys of vice-rectors and library directors. The information is grouped into regional university systems, according to the autonomous community to which each university belongs, and is analyzed on that basis. The results of the quantitative study show increasing interest in open-science activities, expressed as a growing number of publications, and an increase in participation, leadership, and funding in European projects. Institutional policies and regulations on open science, on the other hand, are few and focus almost exclusively on open access. The development of institutional repositories is one of the great achievements of the Spanish university system, and open-access publishing (mainly green open access) has grown considerably in the last decade. Teaching and research staff are not knowledgeable about open science, although in general they take a positive view toward it, while university policymakers report that most actions to promote open science are still in the process of being implemented. The results reveal heterogeneity among the various institutions' practices and implementation. As a regional system, the Catalonian university system stands out above the rest for its degree of open-science policy development and implementation and for its intense research activity in the field of open science.

Keywords

Open science; Universities; Regional university systems; Teaching and research staff; Researchers; University policymakers; Open access; University repositories; Institutional repositories; European projects; *Cordis*; Publications; *Web of Science*; Spain.

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1. Introduction

For two decades now, the open-science movement has been having considerable impact on different realms of the scientific and academic world. The process of opening up scientific knowledge kicked off with open-access initiatives in 2002, culminating when publicly funded scientific literature began to become open (**Méndez**, 2021). Technological progress, mass production of data, scientific social networks, citizen science, educational resources, and open code are shaping a different kind of science, modifying not only the way knowledge is produced but also the way it is shared.

Both the concept of open science and its many names (e-science, interconnected science, science 2.0) have evolved since the early days, and, as **Abadal** and **Anglada** (2020) explain, the names have changed more than the concept itself. While discrepancies over the constituent elements of open science can be found in the scientific literature, there is widespread agreement about two of its ingredients, open access (OA) and open data (*European Commission*, 2016; **Vicente-Sáez**; **Martínez-Fuentes**, 2018; *Foster*, 2018; **Tennant** *et al*., 2019).

The diversity of terms notwithstanding, because of open science's characteristic values of openness, transparency, effectiveness, reproducibility, collective benefit, and improvement of the social impact of research (**Anglada**; **Abadal**, 2018; **Abadal**, 2021, *Unesco*, 2021), this paradigm shift in research is having a huge repercussion in the scientific community and therefore in the realm of higher education.

However, as indicated by **González-Teruel** *et al*. (2022), the existence of a political framework and adequate funding are critical factors for successfully transitioning scientific practices toward the open-science model. The *European Commission*'s initiatives have been fundamental to the transition in Europe, as has the interest of many member countries in aligning themselves with the proposed goals. The interested countries include Finland, Slovenia, the Netherlands, France, and Portugal (**Abadal**; **Anglada**, 2021). In Spain, as shown by previous studies (**De-Filippo**; **Mañana-Rodríguez**, 2022), the legislative panorama is highly dynamic, with a wide range of directives written into laws and regulations. The highest-ranking Spanish legislation on open access is the *2011 Science, Technology and Innovation Act*, which was amended in 2022 by *Act 17/2022 of September 5*.

1.1. Universities as promoters of open science

As social agents, universities have a strong influence and a big social, economic and cultural impact. They mobilize a vast amount of human and financial resources, and they have the infrastructure to turn out high-impact scientific and technological developments. Institutions of higher education form the main knowledge-producing sector in most countries (**Sanz-Casado** *et al*., 2019). Furthermore, universities gather a large-enough critical mass to generate and roll out policies on many topics, including open science.

The prominent role of universities in the implementation of open-science strategies was underlined by the *European Commission* in its report *Open Science, Open to the World. A Vision for Europe* (*European Commission*, 2016). Another important proposal was that of the *Open Science Policy Platform* (*European Commission*, 2018), which gave rise to a series of recommendations for the introduction of open science in the European context on the basis of eight pillars (rewards and incentives, next-generation metrics, the future of scholarly publishing, the *European Open Science Cloud* (*EOSC*), FAIR data, research integrity, education and skills and citizen science) (**Ayris** *et al*., 2018).

The *General Conference* of the *United Nations Educational, Scientific and Cultural Organization* (*Unesco*) held in Paris in 2021 also proposed a series of recommendations for universities (e.g., in the design of rules and regulations), because it sees universities as important entities for promoting the practice of open science in coordination with national and international organizations (*Unesco*, 2021).

At the institutional level, too, some international networks of universities have taken up the challenge of implementing open science, as shown in the declaration of the *European University Association* (*EUA*, 2017) and the roadmaps of associations like the *League of European Research Universities* (*LERU*, 2018) and the *Young European Research Universities Network* (*Yerun*, 2018). The report from the *European Commission*'s *Open Science Policy Platform* (**Méndez** *et al*., 2020), which reviews the progress made thus far in applying the platform's recommendations on the eight pillars of open science, speaks of a general consensus in the future of scholarly communication with more-open practices, practices in which universities' participation is of core importance.

In the Spanish context, support for open science is clearly stated not only in the *Organic Act on the University System* (*Ley Orgánica del Sistema Universitario*), but also in the *Commitment of Spanish Universities to Introduce Open Science*, an undertaking passed in 2019 by the *Conference of Spanish University Rectors* (*Conferencia de Rectores de las Universidades Españolas*, or *CRUE*), which is aligned with international proposals.

> Since 2010, numerous initiatives focusing on open science have been launched to promote and implement open science in Spanish universities

The Spanish university system's biggest strides in open science have to do with open access. The leading entities in terms of open-access implementation and proposals include the *Spanish Foundation for Science and Technology* (*Fundación Española para la Ciencia y la Tecnología*, or *Fecyt*) and the *CRUE*'s *University Library Network* (*Red de Bibliotecas Universitarias*, or *Rebiun*), which have fostered the creation and development of repositories according to the mandates of green open access (*Fecyt*, 2016; 2017; 2018; *CRUE*; *Rebiun*, 2018; 2020; *CRUE*, 2019). In this framework, several universities, primarily public universities, have adopted open-access mandates and created repositories of their own.

Although it has been found that the main impulse for repository creation and open-access policies dates primarily to 2010, some studies do mention earlier pioneering actions in some regional university systems. One such action was the creation in 2001 of *Tesis Doctorals en Xarxa*, a repository of doctoral dissertations assembled by a consortium of 11 Catalonian universities, which established a model that other universities have since followed. The first institutional university repository was created in 2004 at the *Complutense University of Madrid*. Since then, repositories have gradually spread through Spanish universities (**Abadal** *et al*., 2013; **Serrano-Vicente**; **Melero**; **Abadal**, 2018), and now, as the results of our research show, all public universities have a repository of their own. Shared university repositories have even been developed in some autonomous communities (political and administrative regions of Spain). For example, the *RACO* repository of open-access Catalonian journals, a project of the *Consortium of University Services of Catalonia* (*Consorci de Serveis Universitaris de Catalunya*, or *CSUC*) and the *Library of Catalonia*, holds all the journals of Catalonian universities (**Pons-Serra**, 2016). Other major shared repositories are the *Madroño Consortium* (*Consorcio Madroño*) of Madrid universities, which is very actively involved in actions related with open science (*Consorcio Madroño*, 2017), the *Consortium of University Libraries of Andalusia* (*Consorcio de Bibliotecas Universitarias de Andalucía*, or *CBUA*) and the newly organized *Consortium of Valencian University Libraries* (*Consorcio de Bibliotecas Universitarias Valencianas*, or *Buval*), created in 2021.

Recent progress has also been made in the shape of proposed changes in the system that institutions use for assessing scientific output and academic careers, following criteria aligned with the components of open science. An agreement in this sense was signed in 2022 in the framework of *CoARA* (the *Coalition for Advancing Research Assessment*) among over 300 entities from 40 countries, including 52 Spanish institutions, 30 of which are universities (*CoARA*, 2023). The agreement made it clear that institutions of higher education are interested in the further implementation of actions related with open science.

1.2. The Spanish university system

In the 2022-2023 school year, the *Spanish University System* (*SUS*) contained 84 institutions, 50 public universities and 34 private universities (*Ministerio de Universidades*, 2022). The public universities are funded by the state, which establishes their general organizational outlines, while the private universities are financed by private and, in some cases, public funds and are generally operated for a profit. There are also some Catholic universities that confer official degrees whose validity is on a par with that of the degrees earned at public and private institutions; Catholic universities are essentially funded by tuition. Under Spanish legislation, the purpose of universities, whether public or private, is to render the public service of providing higher education.

In addition to classifying universities as public or private, the Spanish university system is decentralized into autonomous communities by the *1983 Organic Act on University Reform* (*Ley Orgánica de Reforma Universitaria*), which modernized university governance and emphasized the role of research (**De-la-Torre**; **Pérez-Esparrells**, 2019). Accordingly, each autonomous community has its own model for funding and evaluating its universities.

The number of public universities in each autonomous community has to do with that region's history, number of inhabitants and component provinces. There is no homogeneous nationwide structure. Some systems span a territory containing a large number of public universities (Andalusia, Catalonia, Madrid and Valencia). There is also a group of autonomous communities that have only one public university apiece, known as the "G-9" university group (Aragon, Asturias, the Balearic Islands, Cantabria, Castile-La Mancha, Extremadura, Navarre, the Basque Country and La Rioja). Furthermore, each system handles a very different volume of students and a very different volume of teachers and researchers. Madrid, Andalusia, Catalonia and Valencia are the autonomous communities with the greatest numbers of potential researchers in terms of scientific output.

This diversity of structure, size and organization among the universities of each autonomous community is of course a decisive element for university activities, so the regional university systems are the focal point of the analysis presented in this paper.

2. Objectives

Bearing in mind universities' role in the development of open science, this study looks into the Spanish university context to answer the following question: do regional university systems have different activity profiles in connection with the implementation of open science?

To find an answer, the following objectives are posed:

- analyze the development of regulations about open science,
- assess the degree of implementation and development of various activities related with open science (especially activities related with research projects and scientific publications),
- ascertain how different actors perceive Spanish universities' open-science activities,
- learn if activity profiles differ, using regional university systems as the unit of analysis.

3. Sources and methodology

To deal with the diversity and breadth of the activities related with open science, four dimensions of analysis are defined:

- regulations, policies and strategies about open science;
- knowledge production;
- research results; and
- perception of open science. Graph 1 shows these dimensions and the studies performed to characterize them.

The sources used and the methodology followed to study each of these dimensions are explained below. The study is structurally organized into these same four realms of analysis.

3.1. Regulations, policies and strategies

The main sources used to trace the extent of the "official" implementation of open-science policies are the websites of Spanish public universities. Public universities were chosen because they are all subject to the common regulations dictated by the ministry in charge of universities, yet each university may well have pursued a strategy of its own in its endeavors to implement open science.

First of all, search criteria were defined and their validity was checked. The search criteria were then applied to the set of public universities in the Spanish university system. The information was searched for and collected from each university's website from October to December, 2022. Terms associated with open-science activities were used to retrieve information about the following points:

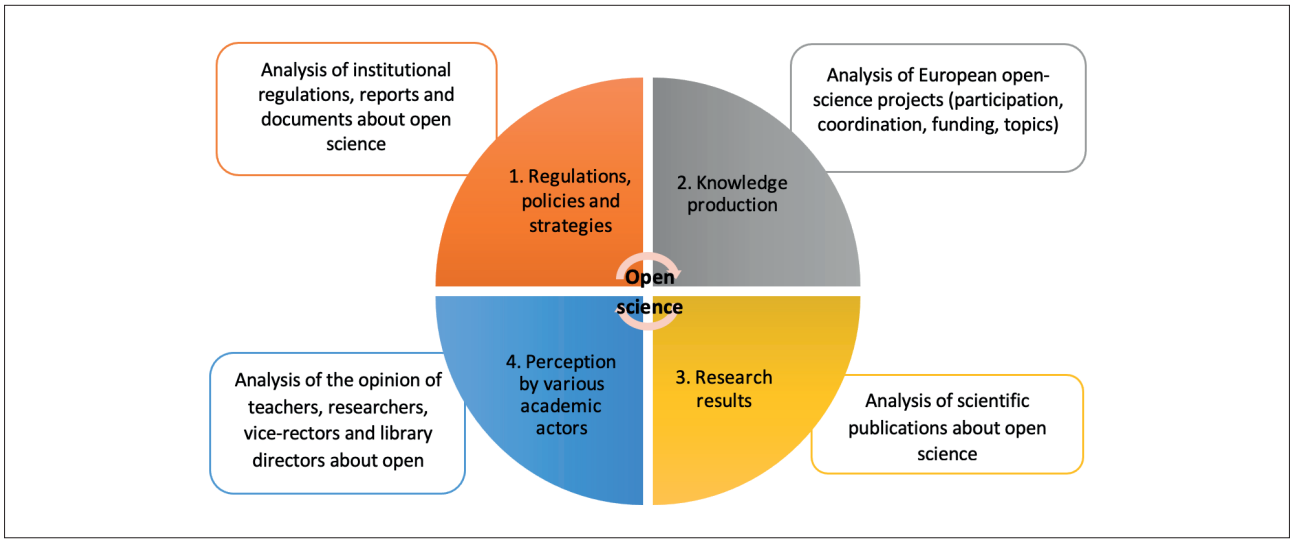
- existence of an institutional repository and the year it was created,
- institutional declaration of an open-access policy and year of approval by the university's board of governors,
- declaration of specific open-science policies,
- location where information on open science can be found (general university pages or university library's page),
- identification of the institutional officer responsible for open science (vice-rector, officer named by the rector),
- specific web page devoted to matters of open science or citizen science.

Although the results were found individually for each university, the information is presented on an aggregate basis by autonomous communities.

3.2. Knowledge production

Information about projects related with open science was obtained from the *Cordis* database *https://cordis.europa.eu*

This source reports the projects run under the various calls of the European framework programmes, which are some of Spanish universities' main funding channels (*Observatorio IUNE*, 2022). *Cordis* also furnishes precise, wide-ranging infor-



Graph 1. Dimensions for analyzing open science in the Spanish university system

mation on numerous variables associated with Spanish institutions' participation, leadership, funding and collaboration. Although the validity of other sources of information about participation in nationwide calls was initially explored, it was ultimately decided to use the European database only, because the alternatives offered little information and made it difficult to identify open-science projects (with the resulting underrepresentation of data) (**De-Filippo**; **Lascurain-Sánchez**, 2023).

Cordis afforded access to information about the European projects in the *Seventh Framework Programme* (*FP7*) and *Horizon 2020* (*H2020*). The projects led or participated in by persons from Spanish universities within the window from 2010 to 2021 (both years included) were selected from this pool. The keyword-based search strategy shown below was then used to identify the projects about open science. This strategy was based on previous studies on the topic and was reviewed and validated by experts in the area.

("open access" OR "open data" OR "open research" OR "citizen science" OR "citizen* scienc*" OR "open science" OR "communit* science*" OR "participator* research*" OR "participator* action* research*" OR "communit*-based research*" OR "citizen* research*" OR "science* shop*" OR "citizen* scient*" OR "public-participation" OR "open innovation" OR "community engagement" OR "citizen awareness" OR "community perception" OR "community-based environmental change intervention" OR "community-based environm*" OR "community-based environmental protest" OR "community based environmental movements" OR "community-based environmental health" OR "community-based environmental education" OR "crowd* science" OR "civic technoscience" OR "community based auditing" OR "community environmental policing" OR "citizen observatories" OR "participatory science" OR "volunteer monitoring" OR "volunteered geographic information" OR "volun* GIS" OR "neogeography" OR "participatory GIS" OR "street science" OR "locally based monitoring" OR "volunteer based monitoring" OR "public participation in scientific research" OR "popular epidemiology" OR "public engagement" OR "participatory monitoring" OR "participatory sensing" OR "open peer review" OR "open reproducibility" OR "open education resources" OR "open hardware for science" OR "citizen observatory", "community engagement research", "biodiversity monitoring", "civic science", "eBird", "locally-based monitoring", "community-based monitor*" OR "science 2.0" OR "interconnected science" OR "e-science")

The strategy was applied to project titles and abstracts (**De-Filippo**; **Lascurain-Sánchez**, 2023).

The resulting information was downloaded in CSV format and was cleaned and processed to find the following indicators:

- number of open-science projects obtained per university in each call,
- number of open-science projects led in each call,
- funding obtained (in euros),
- number of projects obtained by each university as a percentage of the set of projects obtained by the entire Spanish university system.

The results at the institutional level were aggregated by autonomous communities, and duplicated data due to cooperation between two or more universities in the same autonomous community were eliminated.

3.3. Research findings

An international database of scientific publications, the *Web of Science* (*WoS*), was consulted to find the amount of Spanish output about open science.

The search strategy defined in the previous phase was applied again to identify the Spanish publications in the *Web of Science Core Collection* (*SCI*, *SSCI*, *A&HCI*). The search for these terms in the "Topics" (TS) field returned a high percentage of publications that were not relevant, so the search was applied to the "Author Keyword" (AK), "Keyword Plus" (KP) and "Title" (TI) fields. Publications in all document types and all languages indexed by the database for 2010-2021 were retrieved. The publications signed by at least one Spanish institution (CU=SPAIN) were downloaded and entered in a relational database with information about all the document's fields. Data about open access were included as well, considering all the routes covered by the *Web of Science* (gold, green, bronze). Because *WoS* documents include the "Funding" field, it was also possible to identify the output from funded projects. The codes of the *Cordis* projects analyzed in the previous phase were used to identify the funded publications, which were also entered in the database. The information was later processed to eliminate duplicated data. The following bibliometric indicators were found for each university:

- number of publications produced about open science,
- contribution to the *SUS*'s total number of documents about open science, as a percentage,
- number of open-access publications about open science,
- contribution to the *SUS*'s total number of open-access documents about open science, as a percentage,
- number of OA publications about open science, as a percentage of that same university's total number of documents about open science.

Although the information was found on a university-by-university basis (including public and private universities alike), the results are presented on an aggregate basis by autonomous communities, eliminating duplicated data caused by cooperation between two or more universities belonging to the same autonomous community.

3.4. Perception by different academic actors

To place the quantitative information in context, opinions and assessments about how well open science has been introduced at universities were gathered from three relevant interest groups in the university community (teachers and researchers, vice-rectors whose portfolio includes open science and library directors). These opinions were, of course, not indicative of the opinion of the university community as a whole, but they did provide additional information useful for supplementing and interpreting the data obtained from other sources, and thus they helped gain a fuller view of the implementation of open science at universities.

After the groups from which it was considered interesting to glean information were defined, the instruments for gathering the desired information were designed and constructed. Three questionnaires were ultimately prepared, tailored to the characteristics of the three interest groups. The questionnaires for the vice-rectors and library directors share some questions seeking opinions about subjects that both groups deal with. The subjects addressed in the questionnaires were chosen with a view to collecting information about the implementation of open science, using the reference framework of the *Open Science Policy Platform*'s eight pillars (rewards and incentives, next-generation metrics, the future of scholarly publishing, the *European Open Science Cloud*, FAIR data, research integrity, education and skills, citizen science) (**Ayris** *et al*., 2018). This same outline was used to analyze the information obtained from the questionnaires. The questionnaires are available at
https://zenodo.org/record/6509944

where further information about the procedure is given (**Sánchez**; **De-Filippo**, 2022).

The information about teaching and research staff's perceptions of open science was provided by 251 teachers and researchers who answered the questionnaire constructed specifically for their group. The participants were contacted individually in October 2021 through a research panel. The persons available to participate voluntarily in this research were screened to yield a sample including at least 50% women, different positions (chaired professors, full professors), different contract types and employees of universities from all 17 autonomous communities, to ensure adequate regional representation.

The procedure for putting together the vice-rector group was to contact the secretaries of the rectors of all public universities by individual e-mail between May and June, 2022, asking for the person tasked with open-science responsibilities. When the key informant was identified, an e-mail message was sent asking him or her to participate either by answering the questionnaire specifically designed for the vice-rector group or by granting an interview. Eighteen vice-rectors responded by sending in the filled-out questionnaire.

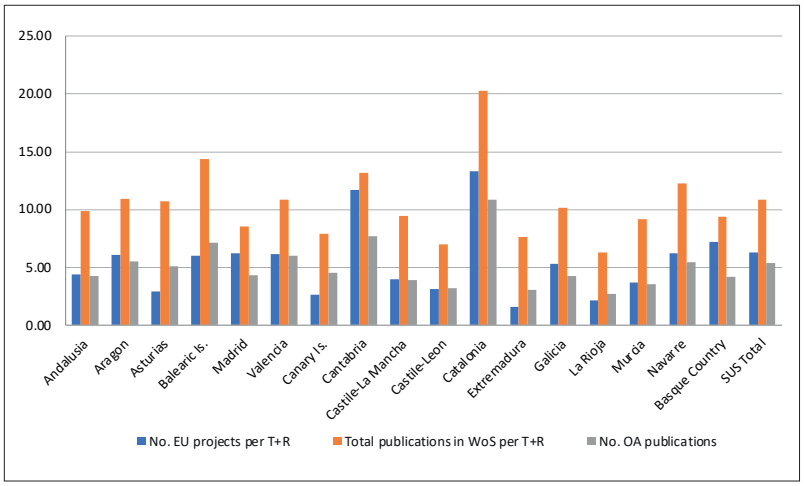
To contact library directors, an e-mail message was sent sometime between May and June, 2022, to the institutional address of the library director at each public university. Forty directors or acting directors responded to the request to participate in the project by sending in the filled-out questionnaire.

4. Results

To furnish an overall view of the situation of the Spanish university system and provide some context for the results of our analysis of the four dimensions, let us first examine the general indicators. Table 1 gives indicators associated with the size and activity of each autonomous community. The number of higher-education institutions in each autonomous community is shown. Next, the total number of permanent teachers and researchers (T+R) active in the last decade is presented. The total number of European projects granted in competitive calls, the total number of scientific publications indexed in the *Web of Science* database and the number of open-access publications are also shown.

The university systems with the highest activity volume belong to the autonomous communities of Catalonia and Madrid, followed by Andalusia and Valencia (table 1).

To put these figures into perspective, scientific activity is calculated according to the number of permanent professors in each autonomous community. In Graph 2, Catalonia leads in all indicators (with 20 publications per 100 teachers, 13 European projects per teacher or researcher and 11 publications per teacher or researcher in a decade). Catalonia is followed by Cantabria and the Balearic Islands; whose high figures are far above the *SUS* mean.



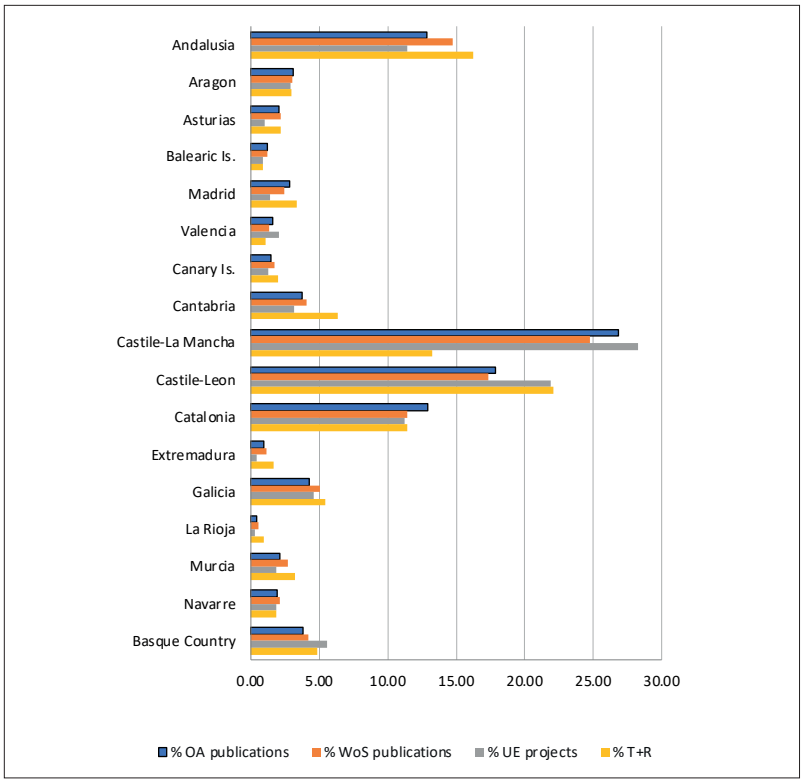
Graph 2. Scientific activity indicators in relationship to the number of teachers in each autonomous community

Table 1. Indicators of scientific activity in regional university systems.

Autonomous community	No. universities	No. T+R	% T+R	Total EU proj.'s	% EU proj.'s	No. *WoS* pub.'s	% *WoS* pub.'s	No. OA pub.'s	% OA pub.'s	OA/ Total *WoS*
Andalusia	11 (10 public)	10,525	16.26	462	11.40	103,659	14.73	44,552	12.88	42.98
Aragon	2 (1 public)	1,939	3.00	117	2.89	21,170	3.01	10,640	3.08	50.26
Asturias	1 (public)	1,421	2.20	41	1.01	15,249	2.17	7,233	2.09	47.43
Balearic Islands	1 (public)	585	0.90	35	0.86	8,405	1.19	4,165	1.20	49.55
Canary Islands	6 (2 public)	2,195	3.39	57	1.41	17,300	2.46	9,839	2.84	56.87
Cantabria	2 (1 public)	710	1.10	83	2.05	9,338	1.33	5,455	1.58	58.42
Castile-La Mancha	1 (public)	1,296	2.00	51	1.26	12,215	1.74	5,058	1.46	41.41
Castile- Leon	9 (4 public)	4,105	6.34	129	3.18	28,699	4.08	12,977	3.75	45.22
Catalonia	12 (7 public)	8,589	13.27	1145	28.25	174,077	24.73	92,903	26.86	53.37
Madrid	16 (7 public)	14,309	22.11	886	21.86	121,842	17.31	61,831	17.88	50.75
Valencia	8 (5 public)	7,408	11.44	454	11.20	80,448	11.43	44,579	12.89	55.41
Extremadura	1 (public)	1,084	1.67	17	0.42	8,273	1.18	3,282	0.95	39.67
Galicia	3 (public)	3,513	5.43	186	4.59	35,754	5.08	14,780	4.27	41.34
La Rioja	2 (1 public)	605	0.93	13	0.32	3,801	0.54	1,610	0.47	42.36
Murcia	3 (2 public)	2,085	3.22	76	1.88	19,168	2.72	7,303	2.11	38.10
Navarre	2 (1 public)	1,210	1.87	75	1.85	14,841	2.11	6,605	1.91	44.51
Basque Country	3 (1 public)	3,156	4.87	226	5.58	29,574	4.20	13,084	3.78	44.24
Total	**82**	**64,733**	**100.00**	**4,053**	**100.00**	**703,813**	**100.00**	**345,896**	**100.00**	**49.15**

Source: Based on *IUNE* (*https://www.iune.es*)

Account is also taken of each regional system's contribution to the Spanish university system's total. Teacher/researcher proportions can be used to detect those indicators that lie above or below the expected figure for each autonomous community. As can be seen in table 1, column 4, the region of Madrid accounts for 22% of the teaching and research staff, but its contributions in other indicators range between 17% and 21.8%, slightly below the expected level. Catalonia, on the contrary, with 13% of the Spanish university system's teachers and researchers, has figures that range between 24% and 28% of the *SUS* total, making it the leading autonomous community. Valencia also displays figures somewhat higher than expected considering its volume of teachers and researchers, while the rest of the autonomous communities have lower figures than expected (Graph 3).



Graph 3. Regional university systems' contribution to the Spanish university system

This initial information provides the context for examining the results of open-science activity, enabling an exploration of the scope of open-science activity in the university system of each autonomous community in the dimensions addressed in Graph 1. Annex 1 lists the universities assigned to each autonomous community (only the institutions where activity about open science was detected are included).

4.1. Open-science regulations, policies and strategies

The analysis of university websites was used to define a number of indicators tracing the introduction of open science in the Spanish university system. Table 2 shows the main results, grouped by autonomous community. Information in greater detail can be found in **Sánchez** and **De-Filippo** (2022).

All Spanish public universities in all autonomous communities have institutional repositories that are assigned a specific name. In 15 of the 17 autonomous communities (88%), there is at least one university whose website contains a document containing an open-access policy approved by the university's board of governors. Madrid (*Polytechnic University of Madrid*) and Murcia (*Polytechnic University of Cartagena*) were the first autonomous communities to post such documents (in 2010). In all autonomous communities, universities have a web page devoted to open access, but there are differences in web page location and access. In most cases the page is on the library's web space. At 19 universities in 10 autonomous communities, an institutional officer for open science either has already been appointed or is in the process of being appointed. At only one university (*Autonomous University of Barcelona*) is there an open-science committee; this is roughly the equivalent of the library committee at other universities, chaired by a vice-rector and made up of representatives of the university community. In 10 autonomous communities, at least one university has a specific web page devoted to open science or citizen science.

Table 2. Open-science regulations and policies in regional university systems.

Autonomous community (No. universities analyzed)	Repository	OA policies since...	OS on library website	OS on general university website	Open-science officer	Open-science/ citizen-science website
Andalusia (10)	100%	2013	100%	0%	20%	30%
Aragon (1)	100%	2013	100%	0%	100%	–
Asturias (1)	100%	2013	100%	0%	–	100%
Balearic Islands (1)	100%	2014	100%	0%	–	100%
Canary Islands (2)	100%	–	50%	50%	–	–
Cantabria (1)	100%	2012	100%	0%	100%	–
Castile-La Mancha (1)	100%	–	100%	0%	–	–
Castile-Leon (4)	100%	2014	75%	25%	25%	50%
Catalonia (7)	100%	2011	57%	43%	71%	71%
Madrid (6)	100%	2010	100%	0%	67%	17%
Valencia (5)	100%	2011	100%	0%	40%	40%
Extremadura (1)	100%	2013	100%	–	–	100%
Galicia (3)	100%	2013	100%	–	25%	–
La Rioja (1)	100%	2022	100%	–	100%	–
Murcia (2)	100%	2010	50%	50%	50%	50%
Navarre (1)	100%	2019	–	100%	–	100%
Basque Country (1)	100%	2016	100%	0%	–	–

Note: "--" means no information was found on this variable at the time of the study

4.2. Knowledge production

The search strategy identified 134 European projects about open science in which Spanish institutions were participants. Fifty-five were funded under the *Seventh Framework Programme*, and 79 were funded under *Horizon 2020*. Spanish universities participated in 52% percent of the 134 projects. The other Spanish institutions involved were the *Spanish National Research Council* (*Consejo Superior de Investigaciones Científicas*), RD&I foundations, private industry, professional associations, the health industry and technological centers. Universities led around one third of the *FP7* projects in which they participated and one fourth of the *H2020* projects in which they participated.

As can be seen in Table 3, the universities of Madrid are the leaders in terms of participation volume, while the Catalonian universities are first in terms of leadership and funding. Madrid has the highest *FP7* project participation figures, while Andalusia also displays good participation figures. Institution by institution, the foremost universities are *Madrid Polytechnic* (13 European projects) and *Catalonia Polytechnic* (12 projects); these are also the institutions that have secured the most funding.

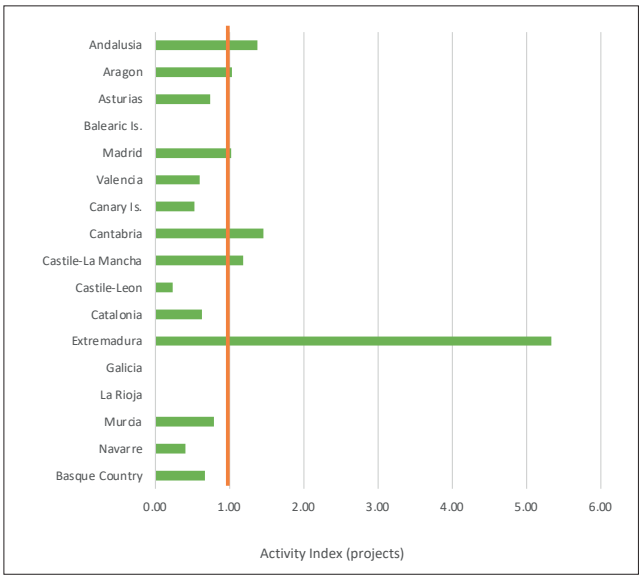
To ascertain whether activities about open science follow the same trend as overall activity in terms of project uptake, the percentages representing each autonomous community's contribution to the *SUS* total (table 1) were compared to the results for open-science projects. It was found that Madrid, with 22% of the *SUS* projects, is also responsible for 22% of the projects about open science. The trend runs the other way in Catalonia, however, where the figures for projects about open science (19.9% of the *SUS*) are lower than expected (Catalonia accounts for 28% of the *SUS*'s EU projects).

Table 3. European open-science projects in regional university systems (*Seventh Framework Programme* and *Horizon 2020*)

	Seventh Framework Programme			*Horizon 2020*				
Autonomous community	**No. projects**	**No. projects led**	**Funding (€)**	**No. projects**	**No. projects led**	**Funding (€)**	**Total No. projects**	**% of all *SUS* projects**
Andalusia	11	0	60,935.00	10	0	692,909.11	21	15.67
Aragon	1	1	173,394.00	3	0	1,228,215.97	4	2.99
Asturias	1	0	5,749.10	0	0	0.00	1	0.75
Balearic Islands	0	0	0.00	0	0	0.00	0	0.00
Madrid	20	2	2,570,501.28	10	2	3,731,083.00	30	22.39
Valencia	6	1	878,532.20	3	0	568,143.75	9	6.72
Canary Islands	1	0	5,749.10	0	0	0.00	1	0.75
Cantabria	3	0	232,069.10	1	0	30,625.00	4	2.99
Castile-La Mancha	0	0	0.00	2	0	994,342.03	2	1.49
Castile-Leon	0	0	0.00	1	0	303,625.00	1	0.75
Catalonia	12	7	4,574,942.74	12	4	5,057,330.26	24	17.91
Extremadura	2	0	5,749.10	1	0	423,152.50	3	2.24
Galicia	0	0	0.00	0	0	0.00	0	0.00
La Rioja	0	0	0.00	0	0	0.00	0	0.00
Murcia	2	0	22,851.30	0	0	0.00	2	1.49
Navarre	1	0	219,600.00	0	0	0.00	1	0.75
Basque Country	0	0	0.00	5	1	2,654,942.50	5	3.73
Total Spain	**55**	**30**	**8,750,072.92**	**79**	**26**	**15,684,369.12**	**134**	100.00

Note: The total number of projects is less than the sum of the projects, because there are some projects in which universities from more than one autonomous community participated.

Comparing each autonomous community's contributions to the total number of open-science projects with that same region's contribution to the total number of the *SUS*'s European projects yields the activity index (% open-science projects per autonomous community/% European projects per autonomous community). As shown in Graph 4, some regions are very engaged in open-science research activity. Their activity index is greater than 1, i.e., their contribution to the number of open-science projects granted is greater than expected. This is the case of Extremadura, which shows low activity in absolute terms but has a high activity index (since it furnishes 2.24% of the *SUS*'s open-science projects but just 0.42% of the *SUS*'s European projects). The other autonomous communities performing above average are Cantabria, Andalusia and Castile-La Mancha.



Graph 4. Regional university systems' contribution to projects about open science

4.3. Research results

A total of 1491 publications about open science were found in the target period. Although the number of documents in the *Web of Science* has been increasing, publications on open science do not make up more than 1% of any university's *WoS*-indexed publications. In absolute terms, the large regional systems, led by Catalonia, have higher numbers of documents about open science (table 4). At the institutional level, the highest production comes from the *University of Barcelona*, the *Polytechnic University of Madrid*, the *Autonomous University of Barcelona* and the *Complutensian University of Madrid*.

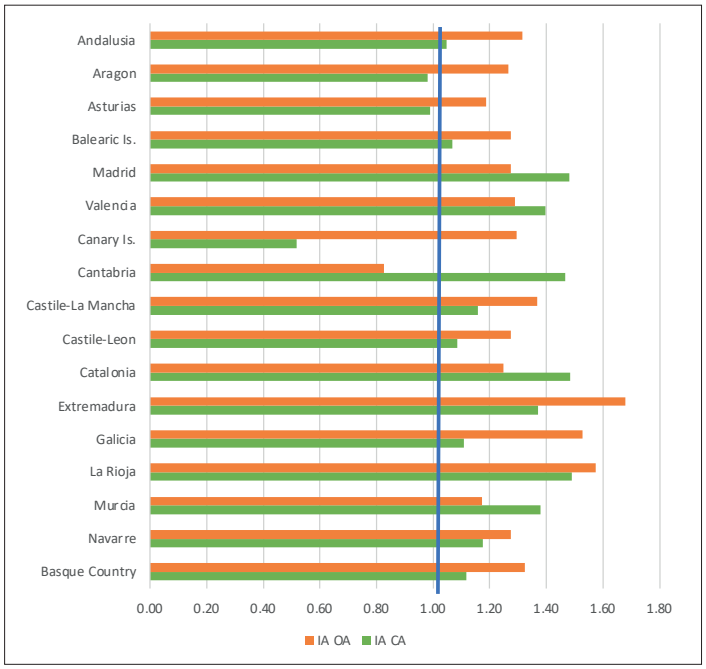
The Catalonian universities also have the majority of the open-access documents about open science (documents accessible via one of the routes considered here) in absolute figures (41.9% of the *SUS*'s open-science publications), followed by Madrid (28%). The leaders in terms of the number of OA publications about open science as a proportion of the total number of publications on open science in each autonomous community are the Canary Islands and Valencia, with over 70% (much higher than the *SUS*'s average of 58%) (table 4).

Table 4. Scientific publications about open science in the regional university systems (*Web of Science* 2010-2021)

Autonomous community	No. publications about OS	% publications OS	No. OA publications about OS	% OA publications OS	% OA
Andalusia	230	15.43	130	14.98	56.52
Aragon	44	2.95	28	3.23	63.64
Asturias	32	2.15	18	2.07	56.25
Balearic Islands	19	1.27	12	1.38	63.16
Madrid	382	25.62	247	28.46	64.66
Valencia	238	15.96	170	19.59	71.43
Canary Islands	19	1.27	14	1.61	73.68
Cantabria	29	1.95	14	1.61	48.28
Castile-La Mancha	30	2.01	17	1.96	56.67
Castile-Leon	66	4.43	38	4.38	57.58
Catalonia	547	36.69	364	41.94	66.54
Extremadura	24	1.61	16	1.84	66.67
Galicia	84	5.63	53	6.11	63.10
La Rioja	12	0.80	8	0.92	66.67
Murcia	56	3.76	25	2.88	44.64
Navarre	37	2.48	21	2.42	56.76
Basque Country	70	4.69	41	4.72	58.57
Total	1,491	100.00	868	100.00	58.22

Each autonomous community's contribution may also be seen in relationship to the total number of publications in *WoS*. In general, the production of publications about open science is intensive: with the exception of the Canary Islands, all autonomous communities have an activity index (AI) of 1 or more. As can be seen in Graph 5, the leaders are La Rioja (AI=1.49), Catalonia (AI=1.48), Madrid (AI=1.48), Cantabria (AI=1.46) and Valencia (AI=1.40). This means these autonomous communities display specialization in the subject.

The activity index (contribution to open-access publications about open science) of all regional university systems except the Canary Islands is more than 1 (Graph 5). This means the proportion of open-access publications about open science is higher than the proportion of open-access publications indexed in *WoS* as a whole.

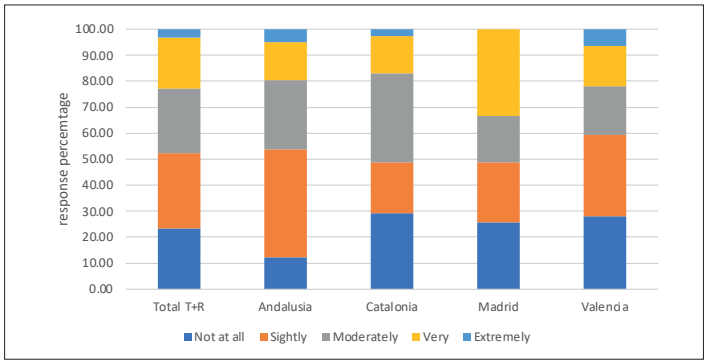


Graph 5. Regional university systems' contribution to publications about open science

4.4. Perception by academic actors

4.4.1. Information about open science

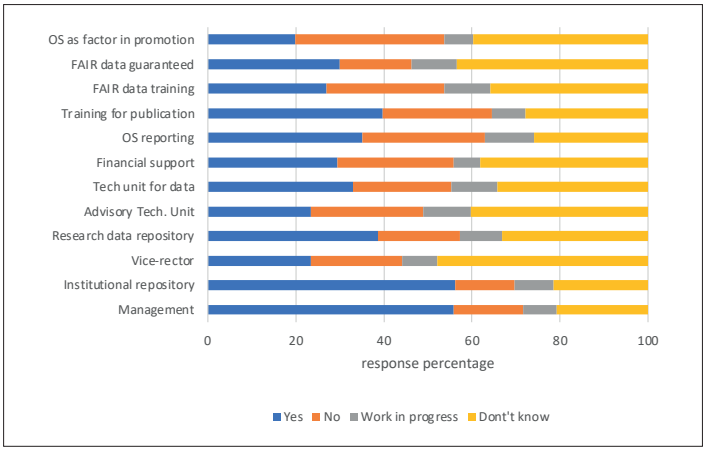
The teachers and researchers who participated in this research were asked how well-informed they considered themselves about open science. The answers on a five-point scale (1=not at all, 5=extremely) show that the participants consider themselves "moderately well-informed about open science" (mean=2.56, SD=1.18). As can be seen in Graph 6, 51% of the participants classify themselves as between "slightly" and "moderately" well-informed. The answers are similar in the four autonomous communities best represented in the sample (Graph 6).



Graph 6. Teacher and researcher information about open science

4.4.2. Information about university initiatives and strategies for fostering open science

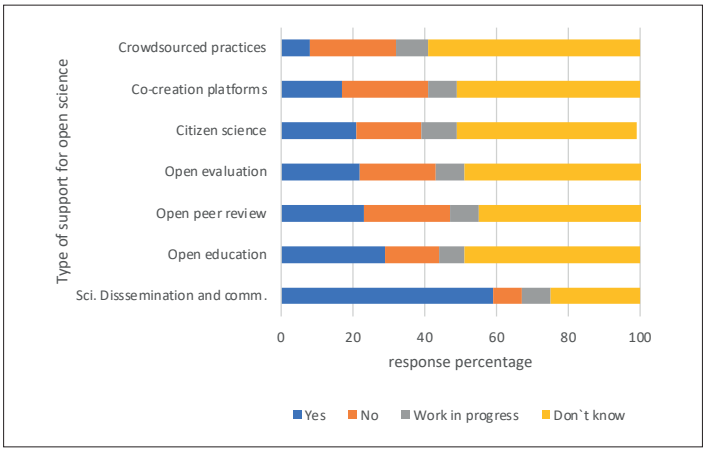
When teachers and researchers were asked to assess their university's initiatives to foster open science, the most frequent reply was "don't know," as shown in Graph 7. More than half (56.2%) of teachers and researchers know that their university has an institutional open-access repository, but 13.5% report that their university does not have a repository, 9% report that their university's repository is a work in progress, and 21.5% do not know if their university has an institutional open-access repository. These data are an indicator of teaching and research staff's ignorance about the subject, since, as said before (Table 2), each public university in the *SUS* does have an institutional open-access repository (*Menéndez Pelayo University* does not have one). Comparison of the universities in the four autonomous communities shows no differences as to the level of staff information on the subject.



Graph 7. Teacher and researcher knowledge of university strategies and actions to foster open science

4.4.3. University policies on open science (teachers and researchers)

The responses show that around half of the teachers and researchers do not know if their university has policies supporting researchers interested in doing open science, such as the policies in Graph 8. On almost all topics, "don't know" was the most frequent answer. Comparison of the four university systems does not reveal any significant differences.

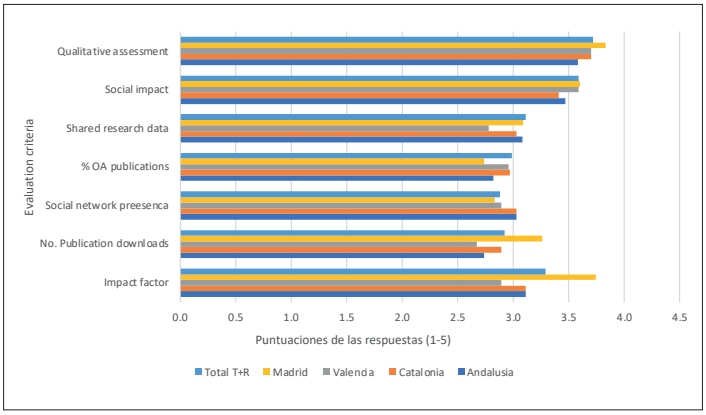


Graph 8. Teacher and researcher knowledge of university policies supporting open science

4.4.4. Criteria for assessing scientific output

Our inquiry into the best criteria for assessing the results of scientific activity in the framework of open science shows (Graph 9) that qualitative evaluation is the highest-scoring evaluation criterion (mean=3.72), followed by journal impact factor and number of citations received (3.29).

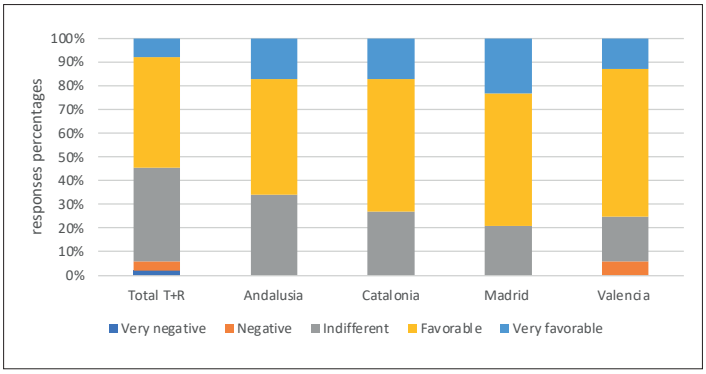
A comparison of autonomous communities reveals some differences in teachers' view of the importance of the impact factor; teaching staff in the Valencia region give this indicator its lowest score, 2.89, while teaching staff in Madrid give it its highest score, 3.74.



Graph 9. Criteria for evaluating scientific output. Assessment by teachers and researchers

4.4.5. Opinion about open science

Teachers and researchers generally voice a positive opinion of open science (3.85), and only 23% feel there are negative aspects associated with open science. No significant differences are found among the members of the university systems of the four autonomous communities (Graph 10).



Graph 10. Opinion about open science. Assessment by teachers and researchers

4.4.6. Open science from the standpoint of vice-rectors and library directors

As stated before, the information contributed to this study by university vice-rectors and library directors was analyzed qualitatively in connection with the *Open Science Policy Platform*'s eight priorities or pillars (**Ayris**, 2018).

In regard to pillar 1 (rewards and incentives), vice-rectors report that the lack of rewards for engaging in open-science activities in assessment and career advancement is the main barrier to transitioning to an open-science model in Spanish universities. Furthermore, over half the vice-rectors admit that their university has not yet evaluated and implemented any system of acknowledgement for engaging in open-science activities.

> "Spanish universities have become more and more involved in participating in and leading European projects on open science in the last decade"

In regard to pillar 2 (next-generation metrics), less than a fourth of the universities of the participating vice-rectors and library directors seem to have planned a policy for research activity recognition that includes open-science principles. The same percentage of universities include criteria concerning open publication in their annual research reports. Forty-four percent plan to prepare guidelines on good and bad practices in traditional bibliometrics and the development of new metrics. Fifty percent plan to train inexperienced researchers to accept the changes required by responsible metrics use.

When questioned about pillar 3 (the future of scholarly publishing), only 20% of the library directors report that open-science publication objectives are supervised. They claim that 90% of their universities track green open-access publication and 80% track gold open-access publication. The majority of the universities (73%) track the public cost of open publication.

When questioned about pillar 4 (the *European Open Science Cloud*, or *EOSC*), nearly half the library directors participating in the study report that their universities have not signed the *EOSC Declaration*. Only 10% have signed the agreement. Furthermore, there appears to be a serious lack of knowledge about this issue, because 35% do not respond.

In regard to pillar 5 (FAIR data), the majority of the library directors report that their university has not implemented a FAIR data policy, while 17.5% say their school is in the process of rolling out such a policy.

About pillar 6 (research integrity), 40% of vice-rectors report that their university has a code of good practice in research that includes the principles of open science. Furthermore, 44% of the vice-rectors assert that their university encourages researcher awareness of how open science can guarantee the highest standards of research. The rest report either that their school does not do so or that some progress has been made, but work remains to be done and there are challenges yet to be faced.

About pillar 7 (education and skills), most of the vice-rectors report that their university has established a specific plan for training teaching and research staff, doctoral candidates and administration and service staff in issues related with open science.

In pillar 8 (citizen science), no university has any procedure in place to encourage citizen participation in research projects. Only two universities foster citizen science using open labs or researchers' initiatives to foster citizen science. A little over a quarter of the universities collect information about their open-science research projects.

The results of the various phases of the study presented in this chapter are discussed below.

5. Discussion

Throughout this research, the goal was to map the development of open science in the Spanish university system based on an analysis of regulations, knowledge production, research results and the perceptions of various academic actors from the different autonomous communities of Spain. To this end, first of all information about the context was gathered, to learn about regional university systems' volume of activities.

The information obtained shows that the university systems of the autonomous communities of Madrid, Catalonia, Andalusia and Valencia are those that have the highest critical mass, in terms of both number of universities and number of students and teachers. These data match the data on distribution by number of inhabitants and GDP (*INE*, 2022), and they bear a direct influence on the volume of scientific activities done. An examination of, for example, scientific publications in the *Web of Science* shows the clear supremacy of Catalonia (25% of the Spanish total), followed by Madrid (17%), Andalusia (15%) and Valencia (10%). In the decade from 2000 to 2010, these four autonomous communities were already responsible for most of the country's output, although the figures were more evenly distributed (**Casani** *et al*., 2013). However, from 2010 to 2021, the universities of Catalonia increased their lead over the other autonomous communities, upping their contribution by two percentage points, while the other regions' output declined.

The findings of our work show that the autonomous communities with the greatest volume of scientific activity in terms of knowledge production (research projects) and research results (scientific publications) are those that have the most public universities. Previous studies of the Spanish university system's characteristics and performance have found this same relationship (**Casani** *et al*., 2014). The authors clearly identified the existence of public and private "subsystems" with very different activity patterns, where public universities were the leaders in terms of absolute numbers of institutions, teachers and students. However, volume is not the only thing that differentiates the public system from the private system. Public universities' research is more visible: their publication percentage in first-quartile journals is much higher. In addition, the public system is more active than the private system and competes more effectively for European pro-

ject funding, plus it has co-operation networks that are more internationally oriented. Public universities display greater activity in competitive drive (ability to secure funds for research in tenders) and knowledge transfer (number of patents and R&D agreements with business) (**Casani** *et al*., 2014).

After discussion of some points related with the general scientific activity of the various regional systems, emphasis was placed on the implementation of open science.

It was found that, as previous studies have observed, open access is the most well-developed open-science initiative in terms of regulations, policies and strategies (**De-Filippo**; **D'Onofrio**, 2019). Accordingly, it became important for us to consider open access in our study as well.

The findings obtained after analyzing university websites showed that the institutions of the various regional university systems have open-access policies approved by their boards of governors and that these policies have been especially keenly applied in the last ten years. In this sense, and in line with the kind of development taking place in the rest of the EU (**De-la-Torre** *et al.*, 2021), Spanish universities were found to be making an explicit effort to align their current open-access regulations and practices with those of Spain's peers. As **De-Filippo** and **Mañana-Rodríguez** (2022) report, how well open-access policies and regulations line up with the practical application of open access is the key to understanding the efficacy of policies and regulations and the real magnitude of application.

Although having open-access repositories and policies is an important step toward implementing open science for universities, the real use researchers put these repositories and policies to should be studied. Other researchers (**Nicholas** *et al*., 2017; **Rodríguez-Bravo**; **Nicholas**, 2019; 2020) have cautioned that repositories are not a very appealing publishing channel for either consolidated researchers (who are reluctant to change their ways, and many of whom still use decision-making criteria motivated by traditional incentives) or young researchers (who seek high-impact journals for reasons of competitiveness). In fact, young Spanish researchers' attitude toward self-archiving and self-archiving tools has hardly advanced at all since 2016 (**Rodríguez-Bravo**; **Nicholas**, 2021)

This situation might be assumed to pertain exclusively to the Spanish context if not for the fact that it has been found in other countries and world regions (**Blankstein**; **Wolff-Eisenberg**, 2019). The results presented in this paper, while not a reflection of the practices of all teachers and researchers, do show that researchers are more knowledgeable about the existence and function of repositories in the development of open science, although there is still room for improvement.

Website analysis also showed that, apart from open-access regulations, other actions related with open science do not yet appear to have been implemented very widely. At only 19 universities of 10 autonomous communities were universities identified that had named (10) or were in the process of naming an open-science officer, and only one open-science committee was identified (at the *University of Barcelon*a). The results show that the topic meets with unequal amounts of interest among the university policymakers of the various regional systems. Catalonian institutions show the greatest progress in this field. Catalonian centers of excellence, like the *Cerca* centers, promote open-science activities –particularly open-access activities– as part of the autonomous community's policies for the non-university realm (**Rovira**; **Urbano**; **Abadal**, 2019). *Cerca* centers frequently collaborate with universities, so they have delivered a major boost to the autonomous community's scientific activities.

This study also looked into projects and publications related with open science. It can be inferred from the results that interest in research into open science is quite recent, since most of the scientific publications and projects cluster in the last few years, coinciding with the roll-out (starting in 2011-2012) of various European and Iberian policies focusing on the promotion and consolidation of the open-science movement.

In the particular case of knowledge production, participation in European calls (one of the main sources of funding for Spanish universities) is observed to be on the rise (*Observatorio IUNE*, 2022). The universities of Madrid and Catalonia, especially the polytechnic universities, lead the pack in terms of the number of projects granted, leadership and funding. International projects tend to deal with subjects concerning computer science or engineering, the same big fields that other recent studies (**De-Filippo**; **Lascurain-Sánchez**, 2023) have detected. This clustering of interest is perhaps one of the reasons why the autonomous communities with polytechnic universities are so active.

When the percentage of open-science projects approved is compared to the percentage of total projects approved, the numbers are the same in both categories (22%) for the universities of Madrid. Catalonia's proportion of open-science projects is, however, much lower than its contribution to the set of European projects (19.9% open science *vs.* 28% European in all fields). In other autonomous communities, open-science research activity is much more intense, as in the case of Extremadura, followed by Cantabria, Castile-La Mancha (whose absolute figures are low, however) and Andalusia.

This interest in open-science research has also been seen in other studies examining participation in projects whose funding comes from sources other than the *European Commission*. For example, a great deal of participation in projects under the *Spanish National Plan* on

> Publications on open science are oriented toward open access, open data, and citizen science

topics related with citizen science and open access has been observed in recent years (**De-Filippo**; **Lascurain-Sánchez**, 2023). Furthermore, analysis of public university websites has identified projects on open science at 66% of institutions. These projects, most of which have to do with citizen science, are generally run by individual researchers under the aegis of entities like the proc citizen science *Ibercivis Foundation*, with no institutional participation by the researchers' university. Analysis based on project title and contents shows that these projects primarily have to do with the environment (**Sánchez**; **De-Filippo**, 2022).

Spain has considerable scientific open-science output, whether the pool examined is the publications covered by the *Web of Science* or the journals indexed in *Scopus*. These data are consistent with those found in previous studies. As a number of authors (**De-Filippo**; **Silva**; **Borges**, 2019) have observed, universities –especially public universities– are the institutions that produce the most documents about open science, particularly those universities that have implemented strategies to promote scientific openness through the creation of institutional repositories, projects about open science and participation in institutional networks for the application of open access. The larger institutions are the major producers, yet there are some other universities that are also highly active in open-science matters, although their output is just average for Spain as a whole. We refer to the polytechnic universities of Catalonia, Madrid and Valencia, which play an important role.

These results make it clear that open-science mandates, regulations and policies have their quantitative counterpart in research output. This is evident not only in the output about open science, but also in open-access publications, whose growth and percentage figures are higher than those of Spanish publications as a whole (*Analytics*, 2022).

Grouped geographically (by autonomous community), the big regional systems (led by Catalonia) are the systems that publish the most about open science in absolute terms. When the indicators about contributions to open-science activities are cast into a more-relative light, it can be seen that all the autonomous communities of Spain display intense activity, evidence of the importance that the topic of open science is acquiring in terms of the dissemination of research results.

Interestingly, a high percentage of publications about open science are open-access publications. The Catalonian universities top this list in absolute figures. Again, the percentage of OA publications about open science is considerable in the Canary Islands and Valencia, although these regions' output figures are more modest than Catalonia's. In the case of the Catalonian universities, the high numbers are not fortuitous; there is a regional open-access policy that includes actions like the "open-access observatory" (in place at all Catalonian universities), which examines the development of open access in Catalonia.

In addition to reporting quantitative results, this study includes information about the way people who can potentially perform activities related with open science see various aspects of open science. This has enabled us to provide a certain amount of context for the quantitative data and identify trends in the perceptions of stakeholders related with open science. One of our data-based conclusions is that the teaching and research staff who answered the questionnaire feel that they have limited information about open science. This academic group displays ignorance and/or only vague knowledge of the initiatives their university is running to encourage open science. They know even less about technical aspects and infrastructure (e.g., data management systems). Nevertheless, in general teachers and researchers think well of open science. Comparative analysis shows no significant differences among the answers given by the staff of the university systems of four selected autonomous communities, except in their opinion of the best criteria to consider when evaluating scientific output.

> "University teachers do not appear to be very knowledgeable about open-science initiatives in which their own institutions are involved"

The views of policymakers (vice-rectors in charge of open science and library directors) go a long way toward explaining teachers' and researchers' ignorance. The vast majority of policymakers feel that the progress made in introducing open science at universities has primarily involved initiatives related with open access to publications. In this sense, they report, strides have been made in universities' support for open-access publication (e.g., payment of open-access publication charges, legal guidance service for researchers interested in open publication). Most of the university policymakers consulted feel that open science is gaining momentum and in fact is formally included in universities' strategic plans, and that progress has also been made in a number of processes related with research data management and the possibility of sharing research data.

However, the data indicate that, at the practical level, most universities have not prepared specific policies on open science, nor have they set up representative committees to work on the subject. Only a fourth of the universities to which the participating vice-rectors and library directors belong have appointed someone to lead the roll-out of open science, one tenth have created units of technical staff in the area of research infrastructure for open science, and just a third have developed some program to raise awareness and provide information about the challenges and changes involved in the practice of open science.

> The development of university repositories is one of the Spanish university system's major achievements, as is the growing amount of open publication being done (especially green open publication)

According to the vice-rectors surveyed, the main barriers to the transition to an open-science model at universities has to do with the fact that employees who foster open-science activities earn no incentives and no acknowledgement in performance evaluations or career advancement. Over half the participants recognized that their university does not look at open-science activities as part of its hiring, performance evaluation or promotion policies. The second barrier in this group's eyes is the absence of nationwide and/or regional policies or directives about open science and the rise in costs (infrastructure, specialized staff, etc.). Library directors add that limited institutional knowledge about matters related with the benefits and limitations of open science is another barrier. Lastly, the surveyed policymakers perceive a certain resistance to change (especially reluctance to share research data) on the part of teaching and research staff.

Analysis of the information furnished by the various groups representing the university academic community shows that open science is generally seen as positive. Teaching and research staff's friendly views on open science appear in other studies (**Rodríguez-Bravo**; **Nicholas**, 2020; 2021), which note that researchers, especially younger researchers, favor open science more in views than in deeds, i.e., actual open publication and research data sharing. This clash between attitude and conduct was also noted by the university policymakers who participated in the surveys, who referred to teachers' and researchers' reluctance to share their research data.

The data analyzed here, especially the data furnished by the survey participants, also show a slow but real movement from the planning stage to the implementation stage. This observation agrees with the results presented in the *Open Science Policy Platform*'s final report (**Méndez** *et al*., 2020).

Nevertheless, some challenges remain to be met. Some of them reflect differences in the way different stakeholders perceive and value the implementation of open access in the universities in the Spanish university system. There are different levels of knowledge and access to information about open science, and the cultural shift needed to get open science really going has not yet happened. **Abad-García** *et al.* (2022) conclude, on the basis of the findings of a 2021 survey of vice-rectors of Spanish universities, that Spanish institutions of higher education still have a long way to go before they consider an overall model that provides more to favor a greater implementation of open science than just planning and policy agenda buzzwords. The study by **González-Teruel** *et al.* (2022) finds a dynamic scientific ecosystem whose actors are becoming increasingly knowledgeable about different aspects of open science and are displaying more-positive attitudes toward it. Some constraints have been revealed, however, that limit the full implementation of open science, which will require institutions to provide the right structures and incentives.

While our study encompasses several dimensions in the attempt to gain a broad overview of the implementation of open science in Spanish universities, we are aware that our work has its limitations. One of its most important constraints is that it focuses on those practices related with open science that can be studied through formal documents like research projects and scientific publications. Learning about other practices, such as free-software development, open data, open-education initiatives and citizen-science actions, involves setting mechanisms in motion to explore the validity of new sources to retrieve reliable, comparable, standardized information. We have begun doing so as part of a research project in progress that will surely reveal new facts about the scope of open science. Another line of research we are currently working on has to do with the proposal of suitable metrics for analyzing open-science activities.

Furthermore, the inclusion of the perception of different academic actors in this study is not intended as a means of drawing conclusions explaining the feelings of the entire academic community. On the contrary, it is a qualitative dimension that was incorporated with the goal of complementing the information gleaned from the quantitative study and providing a rough approach to the opinion of certain key actors. In this sense, the information stakeholders provided was extremely useful for increasing the existing knowledge about the implementation of open science at universities.

6. Conclusions

The results of the quantitative and qualitative analysis bring us to a series of conclusions related with the implementation of open science at Spanish universities.

Open-science regulations, policies and strategies have begun to be implemented in the last 10 years, focusing mainly on open access. The creation of institutional repositories and the dissemination of output by the green route form one of the Spanish university system's major achievements. No great headway seems to have been made, however, in the institutional promotion of initiatives concerning subjects such as open-data management, free software, open evaluation, and citizen science.

While projects and publications about open science have increased in number in recent years, they do not appear to be related to institutional initiatives. Instead, they are the product of certain groups or researchers' individual interest in the subject. Open publication of research results is becoming consolidated as an increasingly frequent practice promoted by institutional and regional initiatives, as in the case of Catalonian universities.

Teaching and research staff are found to be unknowledgeable about open science, although they think well of it. The lack of information and initiatives from universities may explain educators' lack of knowledge about specifics. In view of these data, there is clearly a need to inform the university community about what action is being taken.

> "Open science at Spanish universities is still in the process of being implemented"

The information furnished by key informants who play a major role in university management helps elucidate the teaching and research staff's limited knowledge about open science. At all events, the comparison between the kinds of practices the open-science model espouses (open access to research data, open publication, citizen participation in research) and the way work continues to be done at universities shows that the required cultural shift has not yet happened. In the best of cases, it might be just getting under way, according to the reports of the policymakers who participated in this research.

Generally speaking, there is evidence that whether a university is public or private is a factor that influences the university's scientific performance. In the case of projects and publications, open science is no exception to the rule. Grouping universities into regional systems also reveals certain distinctive, differential characteristics in connection with open science. The Catalonian university system, for example, has more structures and resources available for doing open science. As a whole, Catalonian public universities have the most well-structured institutional repositories and the repositories that offer the fullest information; the Catalonian university system is one of the few that actually does function as a system. Other large autonomous communities, such as Madrid, Andalusia, and Valencia, account for a healthy share of open-science activities and present leading figures in some features, although in general their figures are due to the particular activity of a given university and are not part of a homogenous regional profile. In the autonomous communities that have only one university, the volume of activities related with open science remains low.

In generally, the development of open science in the Spanish university system can be regarded as having made modest progress, but there are major developments that have yet to be made. One of them is the fundamental shift from policy to practice: practice promoted by institutions themselves, in a regional legislative framework that will enable collaborative work and growth throughout the autonomous community's institutions. Training for teachers and researchers, the inclusion of policies rewarding open-science activities, the appointment of university policymakers and officers with powers in open science, and good communication of institutional strategies are some of the things that will be fundamental for moving forward in the consolidation of open science.

The data lead us, as other experts on the subject have (**Anglada**, 2022; **González-Teruel** *et al*., 2022), to conclude that open science has not yet "taken off" in Spanish universities, so the consolidation of open science will depend on what is done in the next few years.

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Annex 1. List of universities in which scientific activity on open science has been detected (by autonomous community)

CCAA	Universidad
Andalusia	*Universidad de Almería*
Andalusia	*Universidad de Cádiz*
Andalusia	*Universidad de Córdoba*
Andalusia	*Universidad de Granada*
Andalusia	*Universidad de Huelva*
Andalusia	*Universidad de Jaén*
Andalusia	*Universidad de Málaga*
Andalusia	*Universidad de Sevilla*
Andalusia	*Universidad Pablo de Olavide*
Aragon	*Universidad de Zaragoza*
Asturias	*Universidad de Oviedo*
Balearic Islands	*Universitat de Les Illes Balears*
Canary Islands	*Universidad de La Laguna*
Canary Islands	*Universidad de Las Palmas de Gran Canaria*
Cantabria	*Universidad de Cantabria*
Castile-La Mancha	*Universidad de Castilla - La Mancha*
Castile-Leon	*Universidad de Burgos*
Castile-Leon	*Universidad de León*
Castile-Leon	*Universidad de Salamanca*
Castile-Leon	*Universidad de Valladolid*
Catalonia	*Universitat Autònoma de Barcelona*
Catalonia	*Universitat de Barcelona*
Catalonia	*Universitat de Girona*
Catalonia	*Universitat de Lleida*

CCAA	Universidad
Catalonia	*Universitat de Vic*
Catalonia	*Universitat Internacional de Catalunya UIC*
Catalonia	*Universitat Oberta de Catalunya*
Catalonia	*Universitat Politècnica de Catalunya*
Catalonia	*Universitat Pompeu Fabra*
Catalonia	*Universitat Ramon Llull*
Catalonia	*Universitat Rovira i Virgili*
Madrid	*Universidad Antonio de Nebrija*
Madrid	*Universidad Autónoma de Madrid*
Madrid	*Universidad Carlos III de Madrid*
Madrid	*Universidad Complutense de Madrid*
Madrid	*Universidad de Alcalá*
Madrid	*Universidad Nacional de Educación a Distancia*
Madrid	*Universidad Politécnica de Madrid*
Madrid	*Universidad Rey Juan Carlos*
Valencia	*Universidad Católica de Valencia San Vicente Mártir*
Valencia	*Universidad CEU Cardenal Herrera*
Valencia	*Universidad de Alicante*
Valencia	*Universitat Jaume I*
Valencia	*Universidad Miguel Hernández de Elche*
Valencia	*Universitat Politècnica de València*
Valencia	*Universitat de València*
Extremadura	*Universidad de Extremadura*
Galicia	*Universidade de A Coruña*
Galicia	*Universidade de Santiago de Compostela*
Galicia	*Universidade de Vigo*
La Rioja	*Universidad de La Rioja*
La Rioja	*Universidad Internacional de La Rioja*
Murcia	*Universidad Católica de Murcia*
Murcia	*Universidad de Murcia*
Murcia	*Universidad Politécnica de Cartagena*
Navarre	*Universidad de Navarra*
Navarre	*Universidad Pública de Navarra*
Basque Country	*Universidad de La Iglesia de Deusto*
Basque Country	*Universidad del País Vasco*

Reliability of domain authority scores calculated by *Moz*, *Semrush*, and *Ahrefs*

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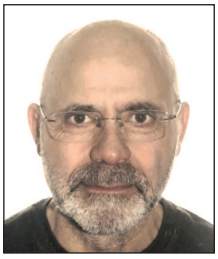

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Abstract

Search engine optimization (SEO), the practice of improving website visibility on search engines, faces the considerable challenges posed by the opacity of *Google*'s relevance ranking algorithm. Attempts at understanding how this algorithm operates have generated a sizeable number of studies in the worlds of both business and academia. Indeed, this research tradition has managed to present strong evidence regarding the participation of certain factors and their relative importance. For instance, there is a widespread consensus that domain authority is one of the key factors in optimizing positioning. This study seeks to determine the reliability of the domain authority scores provided by three leading platforms for SEO professionals: *Moz*'s *Domain Authority*, *Semrush*'s *Authority Score*, and *Ahrefs*' *Domain Rating*, values obtained using different indices and applying different procedures. We hypothesize that the degree of coincidence is high, allowing us to deduce that the three tools are, therefore, highly reliable. The method of data triangulation is used to compare the values from these three sources. The degree of coincidence is determined using a statistical analysis based on Spearman's correlation coefficient (rho). The sample of domains analyzed was selected from 61 neutral queries, which provided 16,937 results and a total of 3,151 domains. When examining the tools in pairs, the correlation coefficients obtained were above 0.9 in all cases. The rho coefficient of the global analysis was also 0.9. This confirms our hypothesis and demonstrates that the three platforms can be considered as providing reliable data. These results are clearly relevant given that SEO professionals depend heavily on domain authority values in their work, and the degree of reliability detected ensures that decision-making based on this indicator can be undertaken with confidence.

Keywords

SEO; Search Engine Optimization; Domain authority; Websites; Web visibility; *PageRank*; *Domain Authority*; *Moz*; *Authority Score*; *Semrush*; *Domain Rating*; *Ahrefs*; *Google.*

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1. Introduction

The factors that determine the positioning of a website on a search engine results page (SERP) are of considerable interest to researchers as they allow us to both understand and predict how the ranking algorithm works (**Vállez**; **Ventura**, 2020; **Zakharenko**; **Smagulova**, 2020; **Vállez**; **Lopezosa**; **Pedraza-Jiménez**, 2022). Likewise, in a marketing environment, interest in the development and application of techniques that optimize website visibility is growing, since it is essential for a company to be ranked at the top of SERPs (**Saura**; **Palos-Sánchez**; **Cerdá-Suárez**, 2017). In Spain, for example, more than 1,000 firms have recently been identified as offering services related to search engine positioning (**Escandell-Poveda**; **Iglesias-García**; **Papí-Gálvez**, 2021). For this reason, search engine optimization (SEO), understood as:

> "the mechanism by which a website or web page is improved to maximize the frequency and quantity of organic traffic from search engines" (**Almukhtar**; **Mahmoodd**; **Kareem**, 2021, p. 70),

attracts the attention of multiple sectors, especially within the worlds of business and academia. Indeed, SEO is a critical activity for any online business today, since it has been reported as being able to reduce customer acquisition costs by 87.41% and to improve the return on investment up to 12.2 times (**Sickler**, 2022).

One of the key challenges facing the application of SEO techniques is detecting the factors incorporated in the ranking algorithms of search engines such as *Google*, *Bing*, *DuckDuckGo*, etc. Here, given that *Google* is the most popular search engine (*StatCounter Global Stats*, 2023; *NetMarketShare*, n.d.), the academic world is especially interested in understanding how its relevance ranking algorithm works. Yet, one of the elements that limits such analyses is the scant information that *Google* itself provides about its algorithm (*Google*, 2022). This lack of transparency has led many researchers to analyze the characteristics of the SERPs in an effort to deduce the factors they involve and the weighting afforded them. In so doing, a number of different reverse engineering methods have been applied in different research contexts (**Lopezosa**; **Codina**; **Rovira**, 2019; **Kostagiolas** *et al.*, 2021; **Vállez**; **Lopezosa**; **Pedraza-Jiménez**, 2022).

However, ranking algorithms are complex and subject to frequent changes (**Van-der-Graaf**, 2012; **Gupta** *et al.*, 2016), which means studies of this type quickly become obsolete and require constant revision. Moreover, it has been reported that more than 200 factors are involved in the *Google* algorithm (**Davies**, 2021; **Dean**, 2021), which further impedes the possibility of performing reliable analyses of their behavior. Yet, while this number of factors may not be entirely accurate, it is a clear indication of the complexity of studies of this type.

Having said that, certain positioning factors can be isolated and studied, most notably, inbound links, download speed, traffic, and website or domain authority. To do so, what is required are quantitative data about that specific factor, obtained from a reliable external source. *Google*'s ranking can then be compared with the ranking of the isolated factor in order to determine the importance of that factor in the relevance ranking and, as such, for increasing visibility and traffic (**Gupta** *et al.*, 2016). Here, not only the number of factors involved in the ranking are relevant, but also their quantitative or qualitative nature –for instance, page download speed (Sp) is a quantitative factor while user experience (UX) is qualitative– and their relative importance needs to be taken into consideration.

To be able to isolate and study a factor, reliable quantitative data must be available. This explains why most researchers use external tools to obtain information –including, the number of unique visitors, the bounce rate, the number of links and the domain authority, among others– that *Google* itself does not supply (**Font-Julián**; **Ontalba-Ruipérez**; **Orduña-Malea**, 2018; **Halibas** *et al.*, 2020; **Linares-Rufo** *et al.*, 2021; **Mladenović** *et al.*, 2022).

The last factor in the list, domain authority, is one of the most recurrent indicators employed in the professional world and one that has been widely used in academic studies (**Saberi**; **Mohd**, 2013; **Vyas**, 2019; **Urosa-Barreto**, 2020; **Nagpal**; **Petersen**, 2021; **Ganguly**, 2022). It refers to a set of positioning factors that depend on the website as a whole, and not on specific webpages. It is based on quality signals associated with the entire web, such as the number of backlinks (**Rowe**, 2018), the domain authority of these linked sites, and website age and size, among other factors.

Google does not have a specific, independent domain authority score that it stores and updates for each website. Yet, it does recognize that there is a set of sitewide quality signals, dependent that is on the web as a whole, and which are constantly being calculated for application to all the pages of the website (**Schwartz**, 2016) to boost or otherwise their positioning.

> "SEO is a critical activity for any online business, because it reduces customer acquisition costs and improves the return on investment"

This has led various SEO service companies to calculate metrics that allow them to quantify the quality of the signals that *Google* uses and which it applies to a

website. In this case, these are isolated metrics that are assigned to all known domains and, moreover, they are updated on a regular basis.

> The lack of transparency has led many researchers to analyze the characteristics of the results pages in order to deduce the factors involved and their weighting

The main companies offering such an indicator are *Moz*, *Semrush*, *Ahrefs*, and *Majestic*. Yet, the task is far from easy given that it requires an index similar to that used by *Google* to be able to identify the quality signals involved. The leader in this field is *Moz*, which has developed its *Domain Authority* indicator. Today, it is widely used by SEO professionals; so much so, in fact, that the company's name for its metric (Domain Authority) has become synonymous with the concept itself. To avoid confusion, hereinafter, we use upper case (Domain Authority) to refer specifically to *Moz*'s metric and lower case (domain authority) for the general concept.

Moz defines its *Domain Authority* (DA) as:

> "a search engine ranking score (…) that predicts how likely a website is to rank in search engine result pages" (*Moz*, n.d.).

Domains with greater authority are therefore more likely to be ranked highly and, so, to generate more traffic (**Chandler**; **Munday**, 2016). Obviously, *Google* does not recognize that *Moz*'s DA plays any role in its positioning.

DA is a quantitative indicator that operates in a similar way to *Google*'s *PageRank*, using a logarithmic scale from 0 to 100 (**Orduña-Malea**; **Aytac**, 2015). *PageRank* was patented in 1998, becoming the key element in *Google*'s ranking algorithm and making a decisive contribution to the enormous success of its search engine. Its competitive advantage lay in the fact that the relevance ranking it generated was of much higher quality than that of its then competitors, including *AltaVista* and *Yahoo!* (**Redding**, 2018).

Yet, *PageRank* is a score given to each webpage, while domain authority is a global value associated with the domain name and, therefore, with the entire website. Thus, although the two indicators are calculated in a very similar fashion and with the same objective, they operate over different fields. Somehow or other, the domain authority is a composite score of the authority afforded each of a website's pages.

For years, *Google* published its *PageRank* values using a toolbar installed in the browser. However, since 2016, *Google* stopped providing this information to avoid the generation of spam and reported that its ranking algorithm was no longer based on this indicator (**Sullivan**, 2016). Despite these claims, various experts conclude that *Google* today uses an updated version of *PageRank*, incorporating new qualitative factors (**Marcilla**, 2022; **Mendoza-Castro**, 2021; **West**, 2021), and that several of the metrics involved in its ranking algorithm act at the sitewide level (**Schwartz**, 2016; **Critchlow**, 2018; **Haynes**, 2022).

John Mueller, a *Google* analyst, acknowledged that the company was still using *PageRank* internally. In 2020, he published a famous tweet that quickly went viral, saying:

> "Yes, we do use *PageRank* internally, among many, many other signals" (**Mueller**, 2020).

He also admitted that *Google* uses quality signals from across the whole website and that these are applied to all the pages of the site to improve its positioning:

> "... when we're looking at, for example, quality signals that are more sitewide, then that's something that applies across the whole website in the state that it's at now. So it's not the case that we would say, oh, five years ago, you had this score for your website. Therefore, your contact will be rated like this forever. But rather we look at your website overall now, and we apply the current score to all of your pages on the website. So that's what we do when it comes to sitewide signals" (cited in **Schwartz**, 2016).

Moz reports domain authority as a score ranging from 0 to 100, based on a logarithmic scale, which implies that climbing from 20 to 30 is significantly easier than climbing from 70 to 80. DA provides a prediction of the position that a website's pages will occupy in the SERPs, with higher scores having a better chance of obtaining good rankings (*Moz*, n.d.). A high DA, therefore, is an indication that a greater number of quality signals have been identified and that the pages are more likely to be ranked highly.

Moz reports that the metric is based on data obtained from its own web index, *Link Explorer*, and that it uses multiple factors in its calculation. It also applies a machine learning model that correlates its data with real *Google* results, which are then used as references to adjust the values obtained.

Semrush and *Ahrefs* calculate a very similar indicator to that of *Moz* (**Soulo**, 2022; **Mendoza-Castro**, 2020): the former has developed what it calls an *Authority Score*, while the latter provides a *Domain Rating*. All three companies calculate domain authority by applying different procedures and using different indexes, but each has the same objective.

> Domain authority is one of the most recurrent indicators employed in the professional world and one that has been widely used in academic studies

In a similar way to *Moz*, *Semrush* defines its *Authority Score* (AS) as a:

> "metric used for measuring a domain's or webpage's overall quality and SEO performance" (*Semrush Team*, 2023).

> Various experts conclude that *Google* today uses an updated version of *PageRank*, incorporating new qualitative factors

It is based on multiple factors of trustworthiness and authority, including search, traffic, and link data, especially backlinks. AS employs a neural network and machine learning to ensure accuracy and that its information is based on actual standings of the most recent results pages. Like DA, the AS is measured on a logarithmic scale from 0 to 100, with the highest scores corresponding to more traffic and a higher ranking (**Varagouli**, 2020).

Finally, *Ahrefs* defines its *Domain Rating* (DR) as a:

> "metric that shows the relative strength of a website's backlink profile", using a logarithmic scale that goes from 0 to 100 (**Soulo**, 2022).

The company reports that the DR is calculated in a similar way to *PageRank*, the main difference being that *PageRank* is calculated for pages, while DR is calculated for websites. The indicator considers multiple factors such as the number of websites that are linked to the site being evaluated, the DR of the linking domains and the number of sites to which each domain links.

Table 1. Summary of the characteristics of the domain authority indicators developed by the three companies

Company	Name of indicator	Logarithmic scale	Main feature in calculation of indicator
Moz	*Domain Authority* (DA)	0 - 100	DA applies a machine learning model that correlates its data with real *Google* results
Semrush	*Authority Score* (AS)	0 - 100	AS employs a neural network and machine learning
Ahrefs	*Domain Rating* (DR)	0 - 100	DR explicitly states that it operates in a similar way to *Google's PageRank*

Each company has developed a distinct indicator which, despite operating the same logarithmic scale from 0 to 100, uses different processing mechanisms and indices –databases– to measure a fundamental element of SEO, namely domain authority –that is, an indicator based on the analysis of backlinks that helps evaluate the ability to attract website traffic and which provides useful information for the creation of a strategy to increase visibility (**Khan**; **Mahmood**, 2018). However, despite the consolidation of companies developing widely used SEO analytics tools of considerable maturity, the need remains to evaluate their validity and reliability when applied to a range of different contexts (**García-Carretero** *et al.*, 2016).

To the aforementioned scarcity of information about *Google*'s algorithm, we can add the rather vague, general descriptions provided by the three companies regarding the operation of their respective versions of domain authority scores. In light of this situation, this study seeks to evaluate the reliability of the indicators developed by *Moz*, *Semrush*, and *Ahrefs* for measuring domain authority. The need arises because we do not know, in any great detail, how these companies calculate domain authority, nor what data they use to do so. More specifically, the goal of this study is to determine the extent to which the three companies coincide in their calculation of the domain authority applied by *Google* and, in this way, to deduce their reliability. These results should be of particular interest to SEO professionals and researchers alike.

2. Methodology

We hypothesize that the three domain authority indicators provide very similar values. If we are able to corroborate this hypothesis, then it can be deduced that the three companies are reliable –in relation, that is, to the objective they pursue, i.e. providing similar metrics for the quality signals that depend on the overall website and which are applied by *Google* in its ranking algorithm (**Schwartz**, 2016)– since the values of one platform serve to cross verify the values from the other two.

However, the three companies calculate domain authority based on their own index data –they are as such three different indices, obtained independently. Moreover, any details of the calculation procedures employed are not made known to the general public nor are they shared between the three companies. They are direct competitors and naturally keep the factors that are included, and the weighting given to them, secret. Yet, they must necessarily employ similar methods of calculation given that they have the same origin and objective; but, it remains unknown just how similar they are.

In adopting such an approach to this study, we implicitly apply, albeit at a small scale, a method based on data triangulation. The same indicator –i.e. domain authority– is calculated for a sample of domains using three different data sources. We then compare and contrast the degree to which the scores coincide: the greater the match, the more reliable the data can be considered from all three sources.

The objective of the triangulation method is to confirm or validate the results of a study applying different methodologies, data sources, theories and even researchers (**Thurmond**, 2001; **Wilson**, 2014; **Arias-Valencia**, 2000; **Heale**; **Forbes**, 2013). The main advantage of triangulation is that when two strategies provide similar results, the findings are corroborated, increasing the internal validity of the study (**Feria-Avila**; **Matilla-González**; **Mantecón-Licea**, 2019).

In the present case, we have not only two, but three, different data sources and, if the hypothesis is upheld and the three sources are similar, then the domain authority indicators will have been doubly validated. Each indicator, therefore, was triangulated by the other two, as follows:

- *Moz* was triangulated by *Ahrefs* and *Semrush*;
- *Semrush* was triangulated by *Ahrefs* and *Moz*;
- *Ahrefs* was triangulated by *Moz* and *Semrush*;

The direct consequence of this validation is that we are able to obtain clear indications of the reliability of the three platforms responsible for their calculation, which constitutes the ultimate goal of this study.

The degree to which the three coincide, moreover, is an important factor to bear in mind: the greater the match, the greater the reliability. To determine just how similar the values of the three tools are, a statistical analysis based on Spearman's correlation coefficient (rho) was used. Correlation coefficients measure the strength of the association between two variables, where the greater the correlation, the greater this association is in the sense that if one variable increases (decreases) so will the other. As such, this statistic also informs of the degree of similarity between the two variables analyzed, which is precisely our objective here. Spearman's rho has been selected and not Pearson's *r* because the variables corresponding to the three tools examined are not normally distributed.

For the calculation, the three indicators were paired off, obtaining the following three pairs: *Ahrefs vs. Moz*, *Ahrefs vs. Semrush*, and *Moz vs. Semrush*. *Next*, the Spearman's correlation coefficient of each pair was calculated and, by so doing, we were able to obtain a partial comparison with pairs of variables. Subsequently, the three pairs were unified to obtain a single value to express the degree of general coincidence.

It is normal practice to use Spearman's correlation coefficient in SEO research to identify which factors play –and the extent to which they play– a role in *Google*'s relevance ranking algorithm (**Ziakis** *et al.*, 2020; **Rovira** *et al.*, 2019; **Rovira**; **Codina**; **Lopezosa**, 2021; **Tavosi**; **Naghshineh**, 2022) and *Google Scholar* (**Rovira**; **Guerrero-Solé**; **Codina,** 2018). Applying the reverse engineering method, the native order provided by *Google* in a sample of unbiased searches is correlated with a second ranking of the same websites, but this time applying a single ranking factor, i.e. the one under study. The higher the correlation, the more similar the two rankings are and, consequently, the more importance the studied factor can be considered as having in *Google's* ranking algorithm.

The context and objective of the present study differ, however, as we are not seeking to implement reverse engineering but rather to conduct a simple triangulation of data. Having said that, the role played by our statistical analysis –in this case, Spearman's correlation– is identical. In both cases, the similarity of two variables, that is, two different rankings of the same sites, domains or webpages, is measured.

To carry out the statistical analysis, we first selected a sample of domain names, avoiding biases, especially of a thematic or geographical kind. Subsequently, the domain authority scores provided by the three tools were obtained for each

Table 2. List of words used in the searches and their origin (GT: *Google Trends*, WF: *WordFrequency*, orig: origin)

#	Word	orig	#	Word	orig	#	Word	orig	#	Word	orig
1	aaron carter	GT	16	ilovepdf	GT	31	some	WF	46	those	WF
2	about	WF	17	into	WF	32	take	WF	47	time	WF
3	also	WF	18	iphone 14	GT	33	takeoff	GT	48	very	WF
4	because	WF	19	jeffrey dahmer	GT	34	tell	WF	49	want	WF
5	come	WF	20	just	WF	35	than	WF	50	well	WF
6	could	WF	21	know	WF	36	that	WF	51	what	WF
7	fifa	GT	22	like	WF	37	their	WF	52	whatsapp	GT
8	find	WF	23	look	WF	38	them	WF	53	when	WF
9	first	WF	24	make	WF	39	then	WF	54	which	WF
10	from	WF	25	more	WF	40	there	WF	55	will	WF
11	give	WF	26	other	WF	41	these	WF	56	with	WF
12	gmail	GT	27	people	WF	42	they	WF	57	wordle	GT
13	good	WF	28	qatar	GT	43	thing	WF	58	world cup	GT
14	have	WF	29	queen elizabeth	GT	44	think	WF	59	would	WF
15	here	WF	30	satta	GT	45	this	WF	60	year	WF
									61	your	WF

domain. To select the sample of domains, different searches were conducted in *Google* using keywords selected in the most neutral way possible. To avoid any bias, the selection of keywords was made by applying two criteria: 1) Fifty words of four or more characters were selected from those identified as being the most frequently used on the web, according to the *WordFrequency* ranking, and 2) the eleven keywords used most during the previous six months to conduct searches on *Google*, according to *Google Trends*, were added. The selection was made in November 2022 just before the data collection (Table 2) carried out between 11/03/2022 and 12/22/2022 (dataset available: **Reyes-Lillo**; **Morales-Vargas**; **Rovira**, 2023).

> What we have are indeed three different data sources but which overall provide very similar data, something we have been able to confirm by double triangulation

It should be noted that the order by relevance of the results of these searches has no influence on the study. The objective of the searches was exclusively to select a random sample of domain names so as then to be able to correlate the domain authority values awarded to them by the three platforms. At no time does the order in the list of results interfere with this objective.

For the collection of data, we used extensions installed in the browser. These allow SEO metrics to be obtained, both from the webpage that is being visited and from listings of *Google*'s results. The following browser extensions were used:

- *MozBar*. Provides both the *Domain Authority* (DA) and *Page Authority* (PA) (**Chandler**; **Munday**, 2016).
- *SEOquake*. Provides the *Authority Score* (AS) developed by *Semrush*.
- *Ahrefs* SEO *Toolbar*. Provides the *Domain Rating* (DR) developed by *Ahrefs*.

The three extensions were installed in the *Google* Chrome browser to carry out all searches and to obtain the scores corresponding to the domain sample for each of the three indicators.

As discussed, to carry out the study, 61 keywords were used (see Table 2). Thus, we conducted a total of 183 searches, with each word being searched for three times, that is, once for each extension. *Google* settings was adjusted to display 100 results per page and the values corresponding to *Domain Authority*, *Authority Score*, and *Domain Rating* were extracted. In total, 16,937 results were obtained.

All the searches were conducted simultaneously and in the same geographical location to avoid any potential bias. Subsequently, the URL information corresponding to the path, file name and parameters was removed, giving us 6,268 domains. All duplicates were then removed, leaving a final sample of 3,151 distinct domains.

Data triangulation was conducted in different phases. First, the reliability of the tools was evaluated to test the hypothesis that the values of the three indicators are similar. To do this, the data were triangulated by correlating pairs of tools, that is, *Ahrefs* with *Moz*, *Ahrefs* with *Semrush*, and *Moz* with *Semrush*. There are only three pairs because the order is interchangeable, that is, the correlation of A with B is the same as that of B with A. Then, second, a global analysis was also conducted, combining the three pairs and integrating all the data in a single sample. Third, based on the initial statistical analyses, we were able to verify that the degree of coincidence was not homogeneous for all domain authority scores. In domains of low authority, the coincidence was lower than in those with high authority scores. For this reason, we opted to carry out an additional statistical analysis comparing low with high values to determine the degree of difference.

A domain was classed as having "high" authority when its score was greater than 50 and as having "low" authority when the indicator was 50 or less. When collecting data with the different applications, if a domain scored more than 50 on one application but less on another, it was classed as "mixed". In the segmented analysis, mixed values were discarded, but they are included in the sample and in the global analysis.

3. Results

As indicated, the sample of domains for analysis was selected from 61 *Google* searches. These provided 16,937 results with a total of 3,151 different domains, which constituted our main sample. The second column in Table 3 shows the number of domains by SEO company for which the extensions actually provided a domain authority score. As is evident, in all three cases, this number is lower than the total of 3,151 domains analyzed. This is attributable to the fact that for 10% of the domains this indicator could not be obtained because the domain was not present in the platform's index. Note that the row headed "Total" corresponds to an aggregate analysis for all three companies.

Table 3. Number of domain authority values obtained with each tool

Company	No. of domains for which an authority value is available	% domains without authority value/ total number of domains analyzed	No. of domains with high authority	No. of domains with low authority	% of high authority domains/ total no. domains with authority score	% of low authority domains/total no domains with authority score
Moz (DA)	2,779	12	2,071	708	75	25
Semrush (AS)	2,828	10	2,179	649	77	23
Ahrefs (DR)	2,870	9	2,430	440	85	15
Total	8,477	10	6,680	1,797	79	21

In the statistical analysis by pairs of the three platforms, Spearman's correlation coefficients greater than 0.9 were obtained in all cases (Table 4 and Figures 2, 3, and 4). This indicates a very high correlation and, therefore, we can deduce a very high similarity between the domain authority values provided by the three companies.

When combining all the pairs by aggregating the data from the three comparisons, we obtain a global value for all the data. In this case, too, the coefficients are also higher than 0.9 (see, last row of Table 4 and Figure 1).

In all cases, the *p*-values are indicative of statistical significance. All four figures highlight this strong correlation with the data points concentrated along the diagonal. Thus, we conclude that the hypothesis is verified: The high correlation coefficient is conclusive of the fact that the data from the three companies are reliable, especially given that they have been doubly triangulated.

In addition, we divided the main sample into subsamples based on the value of domain authority (i.e. high, low or mixed), with 79% of the domains being assigned a high value and 21% a low value. The reason for this imbalance is that the first 100 results of each search were selected and normally the highest ranked results tend to have a high domain authority, given that this is an important factor in *Google*'s ranking algorithm.

Table 4. Rho correlation coefficients for pairs of indicator

Pairs of indicators	rho	p-value
Ahrefs-Moz	0.910625839	0.00000
Ahrefs-Semrush	0.944189752	0.00000
Moz-Semrush	0.934287555	0.00000
All pairs	0.902760654	0.00000

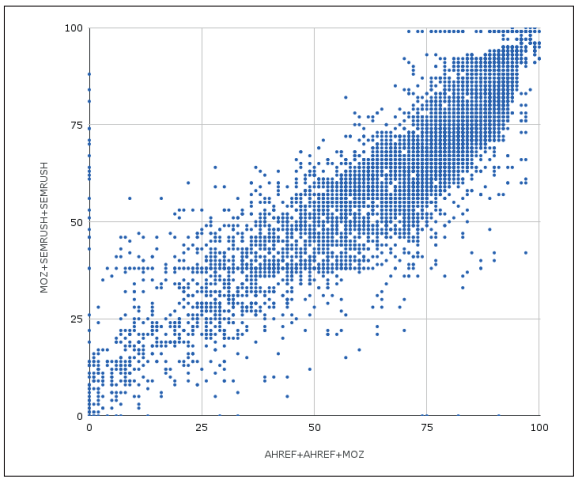

Figure 1. Scatter plot showing all data points

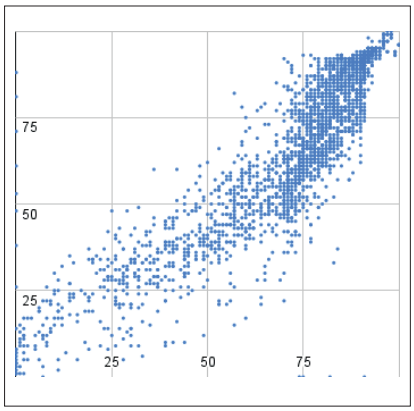

Figure 2. *Ahrefs vs. Moz*

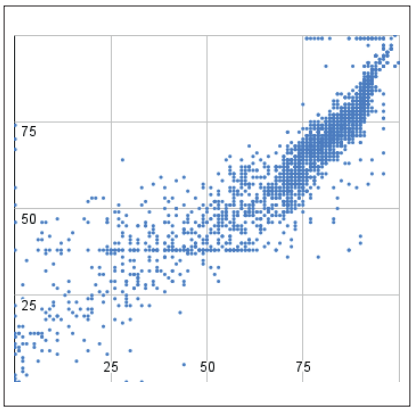

Figure 3. *Ahrefs vs. Semrush*

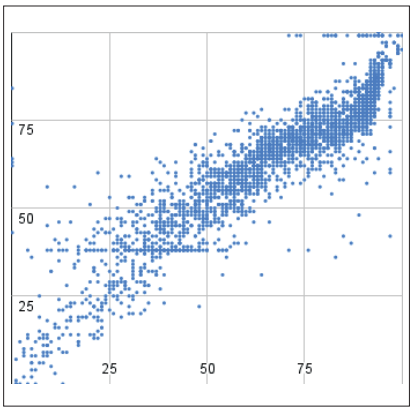

Figure 4. *Moz vs.Semrush*

The analysis of the two subsamples shows that the correlation coefficients of the domains with low authority are notably lower than those with high authority. In addition, the *z*-scores indicate that these differences are statistically significant, since, as can be seen in the last column of Table 5, all the values are greater than 1.96.

In Table 5 and Figure 5, we eliminate the mixed data, that is, where one of the variables presents a high value and the other a low one, since they do not belong to either of the two subsamples. Thus, there are no biases in the results as we are comparing exclusively sites of high and low domain authority. The values corresponding to domains with low authority and a low correlation coefficient (last row of Table 5) are located in the lower-left quadrant of Figure 2. As is evident, the points are clearly more dispersed than is the case of the values of the domains with high authority, located in the upper-right quadrant of the same figure. This dispersion can also be seen in Figures 1, 2, 3, and 4, which show all the values, including the mixed ones. In the following section, we seek to provide explanations for this difference.

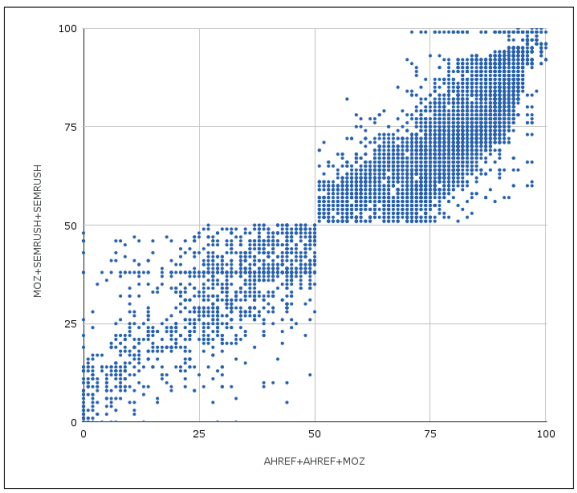

Figure 5. Comparison of high and low domain authority

Table 5. Rho by subsamples of high and low domain authority

Pairs of indicators	High rho	*p*-value	Low rho	*p*-value	*z*-score
Ahrefs-Moz	0.846369484	0.00000	0.682369721	0.00000	7.308646855
Ahrefs-Semrush	0.908198555	0.00000	0.584906247	0.00000	15.070446870
Moz-Semrush	0.868638360	0.00000	0.687958190	0.00000	10.020396070
All pairs	0.826836193	0.00000	0.639401310	0.00000	13.788967200

4. Data analysis

The most surprising outcome to emerge from the preceding study is the high degree of agreement between the values of domain authority calculated for the three SEO companies. Employing different indices but largely similar procedures of calculation –albeit with some differences, the companies' tools provide very similar values.

Two findings emerge from the data analysis that seem to confirm the fact that the three companies do indeed operate different indices. The first is that 10% of the domains do not appear in one or more of the three indicators. The second is that the correlation coefficient of the subsample of low domain authority is lower than that recorded for the high domain authority subsample. This difference is statistically significant and would appear to indicate that the amount of information available to the three platforms in relation to the low authority domains is not as great, and does not coincide to the same degree, as that available to them in relation to the subsample of high authority domains. This explanation, however, needs to be corroborated by conducting new studies based on larger samples, especially as far as the sample of low authority domains is concerned, as it represents just 21% of the data here.

The affirmation that we are in fact dealing with three different indices, and three calculation procedures with certain differences, is important as regards the ultimate objective of the present study: specifically, an evaluation of the reliability of these domain authority tools. Clearly, if we were dealing with three versions of the same index based on similar calculation methods, we would not need to apply the triangulation methodology, since we would be working with a single data source. Thus, what we have are indeed three different data sources but which overall provide very similar data, something we have been able to confirm by double triangulation following the pairing of the three sources.

The correlation coefficients are in all cases greater than 0.9. This is true both for the comparison between pairs of tools and for the overall analysis. These high coefficients confirm that the domain authority values for all three platforms are very similar. Even when analyzing the subsample of low domain authority, for which the correlation coefficient is lower, we still obtain a strong correlation above 0.6. As all the data are highly correlated, we can conclude that they are globally very similar data. One tool triangulates the other two in order to corroborate their values. Thus, we can safely state –as hypothesized– that all three tools are reliable.

5. Conclusions

The methodological and statistical framework designed to undertake this study has had the sole purpose of determining the extent to which the domain authority values provided by *Moz*, *Semrush*, and *Ahrefs* can be considered reliable. According to the results obtained, and as discussed above, the three tools are highly reliable. The values of the correlation coefficients and the cross validation provided by triangulation are indisputable in this regard.

As stressed throughout this study, none of the three indicators studied is directly employed by *Google* in its ranking. But we can conclude that *Moz*'s *Domain Authority*, *Semrush*'s *Authority Score*, and *Ahrefs*' *Domain Rating* are three good estimates of the metrics that act at the website level and which *Google* uses in its ranking algorithm. As discussed, various studies consider this metric to be a quality signal and use it to gain new insights. Our study has provided evidence of the validity of the three commercial versions of the indicator and, in so doing, contributes a more solid basis for future studies in this same line of academic research focused on search engine optimization.

This study, it should be noted is not without its limitations. Here, the most obvious limitation occurs when selecting the sample. Even though the *Google* results page was expanded to obtain 100 items per search query, most of the resulting websites present a high domain authority. With this in mind, in future studies we wish to increase the sample size and analyze a greater number of domains, while seeking to ensure that the proportion between the subsamples of high and low authority domains is more balanced. We also intend including other companies that have tools for calculating domain authority, most obviously *Majestic* and its *Trust Flow* indicator. Likewise, it would be especially interesting to develop a procedure that would allow us to obtain more precise indications of the degree of similarity between the domain authority values provided by the tools of these companies and *Google*'s metrics on the quality signals of an overall website. However, given the lack of transparency on the part of *Google*, this task will be far from easy.

> "The results of the present study demonstrate the reliability of the domain authority calculated by *Moz*, *Semrush*, and *Ahrefs*"

To conclude, we should highlight that domain authority is widely used by SEO professionals in their audits to analyze, among other aspects, competition and to estimate a website's positioning capacity. The results of the present study demonstrate the reliability of the domain authority calculated by *Moz*, *Semrush*, and *Ahrefs*, a reliability that ensures the decision-making based on this indicator can be undertaken with confidence.

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Standing up to Hollywood: the *Netflix* glocal strategy for popularising non-English-language series worldwide

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Abstract

Netflix non-English-language TV shows finding audiences beyond their country of origin is a significant change driven by the company, affecting both the production and distribution sectors as well as the audiovisual culture of Western viewers, who increasingly appreciate diverse audiovisual traditions. This investigation confirms a notable share of foreign product viewership by service users. Between June 2021 and December 2022, non-English TV shows accounted for 38% of the most popular *Netflix* TV rank in terms of accumulated viewing hours, reaching an average of more than 53 countries worldwide. This outcome results from two primary factors. The first is the company's business logic based on *big data*, content indexing, and user monitoring. The second is the global popularity of local non-English speaking content, which is also the consequence of diverse actions taken by the company in project development, audience prototyping, distribution, language, marketing, recommendation algorithms, and social conversation, both locally and globally. This research focuses on *Netflix*'s *glocal* strategy as a case study and draws on direct interviews with company employees, audience data from its *Netflix Top 10* website, specialized publications, and academic literature.

Keywords

Netflix; Glocal; Algorithms; Taste communities; Popularity; Audiences; Global niches; *Netflix originals*; Programming; *Big data*.

1. Introduction

Subscription-channel-driven audiovisual globalization is bringing about a sea-change in viewers' preferences, which for years have been influenced by Hollywood's "cultural imperialism" (**Limov**, 2020). Today, global audiences will recognize the gang of robbers operating under the supervision of a boss they call "the professor"; the exploits of the high-society burglar whose feats (inspired by an early 20th-century literary character) confound the police; and the macabre trials voluntary competitors take part in to win a huge money prize while putting their lives at risk. These are the premises of three recent television series (*Money Heist*, *Lupin*, and *Squid Game*) which differ from other international phenomena in that they were not produced in Hollywood, but in Spain, France, and South Korea, respectively. In all three productions (and many others, as this research confirms), neither language nor place of origin seem to have posed an obstacle to major global impact.

The huge rise in the popularity of local productions outside their country of origin and in their original broadcast format (as opposed to adaptions) is a phenomenon most closely associated with *Netflix*. The company's coverage (over 230 million clients in 190 countries, according to figures for the first quarter of 2023), distribution model (all at once and simultaneously worldwide), brand resonance, and type of promotion have led to success no other local series had previously achieved through the traditional distribution model of region-by-region international sales.

Today, subscription video-on-demand (SVOD) is fully consolidated, thanks not only to market maturity but also to the firm establishment of home digital entertainment. In their beginnings, direct-to-consumer services lived exclusively off third-party content, providing access months after the first commercial exploitation. Over time, the services evolved into a model also based on original and exclusive production, on which they have built their offer to differentiate themselves from competitors. It is also worth noting that subscription-based streaming platform profitability depends on attracting and retaining large customer numbers. The low subscription fee means each customer generates little average revenue per user (ARPU), hence most of the sector's operators adopt a global outlook, which is now driving the deterritorialisation of the digital environment (**García-Leiva**; **Albornoz**, 2017; **Lamkhede**; **Das**, 2019).

As global companies, platforms need to satisfy customers worldwide with their content. They achieve this goal mainly through two lines of action:

- Mainstream content, either original or licensed from third parties (mostly from the United States).
- Local content, anchored in each territory, which generates country-specific catalogues (**Lobato**; **Lotz**, 2020).

The importance acquired by local productions and their popularity beyond their territories of origin justifies the subject of this research, given that it has opened a breach in the traditional hegemony of Hollywood content as the main attraction for customers of these services. The phenomenon is particularly notable in Europe. In the field of VOD, policies to boost European audiovisual circulation were first introduced in 2005 (**García-Leiva**, 2016), albeit with little success. The change came about through the global SVOD services in the 2010s. This is confirmed by data from the *European Audiovisual Observatory* (2021), which show how subscription platform catalogues have played a key role in facilitating access to content from other territories among member states, which has, in turn, increased their circulation.

The relevance of *Netflix* as the subject of study in this article is fully justified. It is currently the sector leader as a VOD service people use to watch films and television series (**Jenner**, 2018), with 232 million subscribers in over 190 countries (2023). *Netflix* started creating original content in 2013 and the delocalisation in its production philosophy became evident in 2016, the year in which it completed its global expansion (**Brennan**, 2018). Since then, the company's investment in production has grown steadily year on year, given its firm conviction that there is a direct relationship between spending on content and growth in subscribers. According to figures from the *Statista* portal (2022), *Netflix* closed 2022 with an investment of 18 billion dollars, a billion more than in the previous year and almost double its investment five years earlier. In 2023, the company announced it was stabilising its spending on original production, as part of the austerity plan adopted due to the post-pandemic recession.

Netflix's investment in producing its content, known as *Netflix Originals*, has proved more advantageous than licensing third-party content (**Lotz**; **Havens**, 2016; **Wayne**, 2017; **Neira**; **Clares-Gavilán**; **Sánchez-Navarro**, 2021), its central business model in its first years of business as a direct-to-consumer service. The consolidation of *Netflix Originals* as an ongoing strategy in the company's operation (**Hidalgo-Marí**; **Segarra-Saavedra**; **Palomares-Sánchez**, 2020) is explained by several factors:

- It is cheaper: once production costs are covered, programmes continue to generate profits, while licences have a time limit and need to be renewed for their continued inclusion in the service content.
- It gives them greater freedom with regard to simultaneous worldwide premiers, growing their potential public and, by extension, their impact and popularity.
- It increases homogeneity in their per-country catalogue and a better understanding of audience reactions in different territories.
- It is the ideal vehicle for international promotion (**Jenner**, 2018; **Lobato**; **Lotz**, 2020).

Netflix sees local production not just as a tool to reach audiences in the regions of origin but also as a means of connecting to global audiences (**Kim**, 2022). By using different globalising techniques, local *Netflix Originals* obtain extraordinary

international circulation (**Fernández-Manzano**; **Neira**; **Clares-Gavilán**, 2016; **Shattuc**, 2020; **Neira**; **Clares-Gavilán**; **Sánchez-Navarro**, 2020), thereby confirming the fundamentally local nature of global tastes, as referred to in **Wayne** and **Castro** (2021).

The local-global pairing in terms of audiovisuals is not a new topic in the academic literature. Huertas-Bailén refers to it as:

> "specifically local content, typical of each country, each television station, each company, but which receives global treatment, considering above all an unlimited, universal audience, as in the past" (**Huertas-Bailén**, 2002).

The recent rise in examples of this pairing (local content with a large international circulation), has been termed glocal. The term, a hybrid of "global" and "local", was popularised by the sociologist Roland Robertson and coined by Japanese economists to explain global marketing strategies implemented in their country. It implies creating products and services for a global market which are also adapted to local cultures (**Blatter**, 2013).

The glocal nature of *Netflix Originals* aligns perfectly with this premise. The productions are markedly local (in terms of such elements as the origin of the production, actors, locations, subject matter and language) and then globalised thanks to techniques and practices designed to reach audiences in other countries, a "network effect" that, as noted by **Cascajosa-Virino** (2018), is one of the main competitive advantages of the SVOD model. Their rise within the *Netflix* offer is largely due to the success of the strategy, which has led to a substantial increase in viewership. According to the *Netflix* co-CEO, Ted Sarandos, in statements made during the presentation of the results for the third quarter of 2022, viewing foreign-language content among platform users has increased threefold since *Netflix* started its original productions. He describes the origin of the idea of local production with a global outlook in the following way:

> "I started thinking about the impact of this growth and how we had within our grasp the chance to bring new storytellers from any part of the planet to everyone and that they could dictate how television and film would be made in the future" (*Netflix Investors*, 2022).

The success of this glocal strategy, based on production with a territorial focus (**Hidalgo-Marí**; **Segarra-Saavedra**; **Palomares-Sánchez**, 2020), combined with the demands arising from the 30% quota for European content, imposed on the catalogues of these services by *Directive (EU) 2018/1808* (*Unión Europea*, 2018) regarding audiovisual communication services, has encouraged other international direct-to-consumer platforms, such as *Prime Video*, *HBO Max* and *Disney+*, to replicate the strategy and turn to foreign-language production to strengthen their international positions. This situation further justifies the interest in this area of research, given its potential importance to the current audiovisual production model.

> "Local-origin *Netflix Originals* obtain extraordinary international viewing figures thanks to the different globalising techniques executed by the company"

It is worth noting there was a drop in the platform's volume of original production, including the local sphere, in 2022, and more so in 2023. The post-pandemic economic downturn (causing subscription figures to fall), the delicate geopolitical situation in Eastern Europe (which has lowered growth forecasts in the region), market saturation due to the launch of new services, and new Wall Street directives with regard to valuing platforms (moving the focus of attention from the subscriber numbers to profits) has led to greater austerity in spending. According to estimates from the consultancy firm *Ampere Analysis*, the production budget for global players for 2023 will be 26.5$ billion, 14% up from the previous year. Although this is lower than the 7.2$ billion rise in 2021-2022, the importance platforms place on original content is still evident, despite a more cautious and selective approach to suit the more saturated streaming market (**Szalai**, 2023).

2. Objectives and methodology

The international consolidation of global streaming platforms and the fact that they have all opted for producing original content has attracted the attention of the academic community in analysing the phenomenon. As Lobato and Lotz note,

> "*Netflix* is a fascinating object of study because it uses a new distribution technology and a previously uncommon business model and is disrupting established norms of international video distribution based on temporal and spatial windowing" (**Lobato**; **Lotz**, 2020).

The significant rise in local production, the efficacy of mechanisms to boost its popularity abroad and changes in users' consumption dynamics, with greater receptivity to non-Anglo-Saxon-origin content, all explain the interest of this research, whose starting point is the following hypothesis (H1):

The global popularity of local *Netflix* non-English-language productions beyond their territory of origin stems from a glocal-based strategy, executed through different lines of action in areas such as creation, audience prototyping, distribution, language, marketing, recommendation algorithms and social conversation.

In the field of local production, restricting the subject of analysis to fictional series was considered appropriate, given their relevance in terms of volume and their capacity to create audience loyalty (**Cascajosa-Virino**, 2018).

The hypothesis validation is centered on two key objectives:

(O1) Analysing original content promotion elements in the *Netflix* strategy. To do this, we will take as our reference the academic contributions by **Linares-Palomar** (2009) and **Herbera**, **Linares** and **Neira** (2015) on commonly used promotional and distribution strategies in the industry in both the preparation and launch phases.

(O2) Understanding how this strategy, applied to non-English-language series, succeeds in improving their *travelability*, a term coined by the consultancy firm *Parrot Analytics* (2018). This is an indicator measuring the ratio between demand for specific content in the original place of production and all other markets.

This article uses the case study method (**Yin**, 2009), which is justified by the fact that this is empirical research based on a real phenomenon, in a specific context and using different sources of evidence. It is especially appropriate for acquiring diagnostic competencies in a world of constantly changing markets and technologies (**Peña-Collazos**, 2009).

The holistic approach, using various sources of information to better understand the phenomenon analysed, is an inherent part of case studies. To this end, Table 1 shows the sources that were used to compile relevant data.

Table 1. Sources for data collection

Data source	Sample	Objective
Netflix Top 10	Hours viewed for non-English-language television programmes. Weeks in the top 10 most popular programmes. Number of countries in which the content has entered the top 10. Period considered: June 2021-December 2022.	To specify the positioning and volume of consumption of non-English-language television series. To quantify their popularity in terms of persistent viewership and travelability to countries other than the territory or origin.
Personal interviews with the content managers in Spain, Europe and Latam (*Netflix* and *HBO Max*). Interview with the Press and Communication Manager (*Netflix Spain*). (The interviews were managed through the communication and publicity departments of *Netflix* (LLYC) and *HBO Max Spain*).	Diego Ávalos (*Netflix Spain* VP of original content). Francisco Ramos (*Netflix Latam* VP of original content). Christina Sulebak (CEO of *HBO Max Europe*). Rut Rey, Serior Communications Manager (*Netflix Spain*).	To identify *Netflix*'s editorial line in selecting and carrying out projects in two territories (Spain and Latam). Opinion on the importance of local originals Editorial line of the competition (*HBO Max*) regarding local content. Official information on content dubbing and subtitling in *Netflix*.
Other external sources: statements by *Netflix* employees on professional forums, information from their official website and press releases by the company.	*Harvard Business Review* *Variety* *The Hollywood Reporter* *El País* *Business Insider* *Netflix Tech Blog* *Netflix Investors*	To identify a common discursive thread in statements by company executives since *Netflix* first started original production.

The *Netflix Top 10* website, the primary source for quantitative information for this study, is the main public and systematic reference source on the performance of the company's programmes.
https://www.netflix.com/tudum/top10

The information from the site, which is submitted to a yearly independent third-party audit, is gathered, and published in line with the following methodology:

- The lists provide series rankings of total hours viewed for each title.
- The rankings are divided into four categories (films and television programmes in English and non-English languages).
- For each title in the rankings, *Netflix Top 10* also gives the number of countries in which it has entered the respective lists of top 10 content.
- The data are measured weekly and updated every Tuesday.
- Each season of a series is calculated separately, and all are eligible for inclusion in the ranking.
- The figures are rounded to the nearest ten thousand for the final result to avoid distortions caused by fluctuations in Internet connectivity worldwide.
- The website historic data the website go back to the end of June 2021.

The process for obtaining information from in-depth interviews, the second source of information in this case study, is described in Table 2.

The academic and professional research literature on new audiovisual distribution models on the Internet (**Álvarez-Monzoncillo**, 2011; **Keating**, 2012; **Tryon**, 2013; **Cunningham**; **Silver**, 2013; **Holt**; **Sanson**, 2013; **Lotz**, 2014; 2018; **Landau**, 2016; **Lobato**, 2019; **Neira**, 2020) and television programming theory (**Contreras**; **Palacio**, 2001; **Gómez-Escalonilla**, 2003; **Bustamante**, 2004; **Arana**, 2011; **Izquierdo-Castillo**, 2016) helped establish the general parameters on how this

Table 2. In-depth interviews

Name and position of the interviewee	Objective of the interview	Date	Medium	Main contributions to the case study
Diego Ávalos (*Netflix Spain* VP of original content).	To learn about the company's editorial philosophy, especially with regard to local Spanish production, coinciding with the 5th anniversary of the launch of *Netflix* in Spain.	14/10/2020	Email	"It fills us with pride to see how that initial intuition, on how great stories can come from and reach anywhere, is now a reality." "Thrilling people all over the world with series such as *Valeria* or *Money Heist*, or films like *The Platform* or *The Paramedic*, shows that these are truly stories that unite us." "Our philosophy is to offer our members the best entertainment and give them control over what and how to watch it. This is still completely valid. Indeed, in the current context, we are more aware than ever of the strength of great stories in providing users with this window on the world, this connection with other realities." "Spain has an incredible talent base, in front of and behind the camera. Having an exceptional creative, acting, and technical ecosystem largely explains the great stories that are born in this country." "This country serves as a bridge between two continents: it is an enclave connecting Latin America and Europe, with a language that is creating ever more interest and is shared by 580 million people worldwide." "We invest in highly varied projects without guidelines or templates. We follow our intuition, investing in authentic stories is our only formula: there is no science behind what we do, there is creativity, dedication and, indeed, art."
Francisco Ramos (*Netflix Latam* VP of original content)	To learn about the company's editorial philosophy, especially with regard to original production in another territory (Latam).	24/09/2020	Video conference	"We are breaking down a consolidated barrier in which Spanish is for Spain, Mexican is for Mexico, and Uruguayan is for Uruguay." "Language connects us but that doesn't mean we are building a single culture." "The specificity and unique vision that each creator brings to this project is what makes it local but also universal. Without specificity we lose identity." "We have good competitors who are reaching the same understanding as us (with regard to local production)." "We have to empower local executives in each country so they can build local teams."
Christina Sulebak (CEO of *HBO Max Europe*)	To learn about the company's editorial philosophy with regard to local production.	25/10/2021	Personal interview	"We think globally but act locally." "Local tonality is what determines the best service for us."
Rut Rey (*Netflix* Senior Communications Manager)	To obtain official information on *Netflix* dubbing and subtitling.	18/03/2020	Email	*Netflix* subtitles into 37 languages and dubs into 34. In 2021, *Netflix* subtitled over 7 million minutes and dubbed over 5 million minutes.

type of direct-to-consumer services functions. The latter aspect was broadened with literature on programming, focussing specifically on the over-the-top market, providing a better understanding of common formulas for generating consumption flows in on-demand ecosystems (**Cox**, 2018; **Heredia-Ruiz**; **Quirós-Ramírez**; **Quiceno-Castañeda**, 2021; **Izquierdo-Castillo**; **Latorre-Lázaro**, 2022) in which the absence of programming means most viewership is the result of self-programming, to use the term in **Jenner** (2016). An audience-related literature review was also carried out on basic aspects such as methodology, trends and purposes within the media ecosystem (**Iglesias**, 1985; **McQuail**, 1992; **Huertas-Bailén**, 2002; **Morley**, 2003; **Gillespie**, 2007; **Napoli**, 2008). Finally, a broad literature review was conducted on *Netflix*, especially with regard to the use of big data and recommendation algorithms (**Morris**, 2015; **Gómez-Uribe**; **Hunt**, 2016; **Jenner**, 2016; **Hallinan**; **Stiphras**, 2016; **Fernández-Manzano**; **Neira**; **Clares-Gavilán**, 2016; **Iñigo-Daw**, 2017; **Jenner**, 2018; **Lamkhede**; **Das**, 2019; **Siles** *et al*., 2019; **Shapiro**, 2020; **Shattuc**, 2020; **Shimpach**, 2020) for a deeper understanding of the company's mechanism to achieve greater programme efficiency, better-viewing statistics and larger audiences for their original products.

3. Personalisation and self-programming: how *Netflix* builds global audiences

The term "programming", inherent to television, covers a set of techniques that string programmes together to be broadcast and viewed simultaneously (**Arana**, 2011). Programming has two dimensions. The first one is strategic: creat-

ing value for the target public of the medium through the composition of the content or "macro-assembly" (**Bustamante**, 2004). The second has a brand dimension: configuring a channel's offer to create a unique identity to differentiate from the competition. As Izquierdo-Castillo and Latorre-Lázaro note,

> "OTT and linear television share the same needs that once justified the development of TV programming. In other words, they need to seduce and retain consumers, adapt the offer to their wishes, influence their viewing routines and also build an original discourse, a global expression as an enunciating entity with which to differentiate themselves from a competitive environment" (**Izquierdo-Castillo**; **Latorre-Lázaro**, 2022).

In this sense, the purpose of programming is to generate a programme flow that encourages audience contact with the medium for as long as possible. This task, which in television is performed by the programmer, has changed hands in the streaming platform environment, while the goal remains the same: intensifying audience attention as far as possible (**McQuail**, 1992).

Platforms have empowered users and placed them at the heart of the system (**Heredia-Ruiz**; **Quirós-Ramírez**; **Quiceno-Castañeda**, 2021), as they can build their programming from references provided by the streaming service. However, finding something to watch from the broad offer these services provide, most of which is completely unknown, is a major impediment to users obtaining the programming flow that fosters continuity of use. This flow is fundamental for the platform, as it is essential for retaining its customers.

Based on user-generated information, *Netflix* has identified a critical 90-second window, the average time the customer takes after opening *Netflix* before entering a "decision-fatigue" state that drastically reduces their likelihood of watching something (**Gómez-Uribe**; **Hunt**, 2016; **Fernández-Manzano**; **Neira**; **Clares-Gavilán**, 2016).

Algorithms play a key role in fostering flow and creating selections of relevant, personalised content. Their importance stems from audiovisual "platformisation" itself, which has replaced the traditional expert choice-based editorial logic with algorithmic curation (**Gillespie**, 2014). Today, algorithms determine content visibility (**Nieborg**; **Poell**, 2018) and have become the primary source of discovery in practically all companies that provide online content (**Morris**, 2015; **Lamkhede**; **Das**, 2019; **Shapiro**, 2020).

Netflix is the audiovisual paradigm for these models, based on personalised viewing practices and indexed and tagged programmes to help others configure their own media diet (**Álvarez-Monzoncillo**, 2011) also quoted as television self-programming (**Jenner**, 2016). This VOD service has become the benchmark in how it merges technology, the information it associates with content (metadata) and data from users' online viewing, in a complex alchemy of audiovisual pairing through algorithms.

Managing large volumes of data is what makes television flow possible in the context of streaming (**Heredia-Ruiz**; **Quirós-Ramírez**; **Quiceno-Castañeda**, 2021). *Netflix* crosses all the user data it monitors (such as type of content played and rejected, play characteristics, frequency and intensity, type of access device, pathways in the app and their location, among others) with a broad spectrum of metadata the company associates with content (such as whether it creates a good mood, involves difficult family relations, is "dark" and so on). The aim is to discover common patterns, i.e. common elements in the content the viewer watches (topics, genres, actors, subjective elements, etc.), and then generate recommendations based on these points of contact. Thus, around 80,000 micro-genres have been constructed which *Netflix* uses to index and present their personalised offer (**Madrigal**, 2014). The company performs a similar process for how the offer is presented visually (**Amat** *et al.*, 2018). As well as the metadata, the content is paired with a collection of images, which the algorithms select to present on the interface in a way the best matches the users' preferences.

Within *Netflix*, users are placed at the centre of a circular data flow or invisible computational processes, following Cox´s terminology (**Cox**, 2018) in which they are the starting point and target for the service logic. The system feeds off preferences traced from users' consumption which, thanks to the algorithms, is returned to them in the form of recommendations. Thus, the platform fights to gain users' attention, in which, in general, the time spent on certain content or channel is a determining factor (**McQuail**, 1992). The end goal is to increase viewing hours and engagement with the platform in an infinite commercial loop (**Hallinan**; **Stiphras**, 2016; **Siles** *et al.,* 2019). In achieving this, the content becomes malleable and modular in its design, informed by datafied user feedback and subject to constant review and recirculation (**Nieborg**; **Poell**, 2018).

The constant transformation in how content is presented, in this effort to adapt to users, means the attributes that define their creative identity, as conceived in the creator's mind, become diluted. For *Netflix*, content can adopt different forms and is configured over and over again, highlighting certain characteristics and hiding others, to match users' preferences (**Jenner**, 2018). In practice, this process means providing different doors onto the same content to increase contact points with the whole potential audience, instead of enclosing it in a single category. For instance, a user could enter the universe of the *Netflix Original Ozark* by genre (thriller or drama), specific characters (strong women, disadvantaged classes, morally ambiguous characters, analytical minds), universal concepts

> In *Netflix*, users lose their social characteristics and attributes and are given a new algorithmic identity, based on viewing preferences

(parent-child relations, good versus evil, revenge, the fight against adversity) or specific topics (drug smuggling, money laundering, extortion, gambling, mafia), among many others. Based on the customer's history, the company uses combinations of these attributes in the form of micro-genres and images it considers most appropriate for attracting the user's attention and producing the pairing. Thanks to this multifaceted vision of content and users, *Netflix* can increase the efficiency of its content (i.e. the ratio between the cost of production and the number of viewer hours it generates), as the programmes use different visual and conceptual stimuli to convince the user to press play and, consequently, end up watching it. The process also works in reverse, i.e. reducing uncertainty in production and licence acquisition decisions. Using the elements into which a programme is broken down, the platform can calculate whether there is a potential audience for it. To do this, it takes programmes that common metadata as a reference, quantifying the contacts they have had with platform customers (**Dye** *et al*., 2020).

> "The fact that local content is capable of satisfying audiences in different countries explains not only its significance in the company's master plan, but also *Netflix*'s interest in international territories, where its competitive position is strengthened through a strategy without competitors at this scale"

Despite the supposed neutrality of algorithms (*Netflix* has stated on several occasions that their recommendations are guided by the aim of providing users with what they want), there is no lack of voices in academia warning of the dangers inherent in the intervention of algorithms, which have become a cultural intermediary between supply and demand in this new model of the digital economy. As Van-Esler notes,

> "One of the main attractions of services like *Netflix* are its personalised algorithm-generated recommendations, in which a person's viewing habits are entered into a large matrix of data from other users to determine the content they will like most. In performing this process, the choice is clearly delimited to the television programmes and films the algorithm considers most appropriate" (**Van-Esler**, 2021).

The term "cultural conformity" is also mentioned (**Hallinan**; **Stiphras**, 2016), as the algorithm provides constant reaffirmation of what we already like, rather than incentivising discovery to generate different tastes. Furthermore, the system has clear implications for how our preferences are constructed, as it prioritises the latter, displacing other traditional standards, such as quality and diversity (**Morris**, 2015).

4. Reverse audience engineering: taste communities

The international consolidation of *Netflix* with a type of programming that includes major investment in local production is only possible largely thanks to how they understand and manage the customer base. The key lies in how to mine their audiences, based on audiovisual preferences rather than demographics or geographical origin.

The advantages of understanding and mining audiences with this mentality were shown in *Netflix Prize*, a competition organised by the company in 2006 to improve the precision of the recommendation algorithm. The work of the *Pragmatic Theory* team, one of the winning companies, demonstrated that traditional information such as sex, age and ethnic origin was not enough to capture those subtle but relevant elements that influence people's decisions with regard to a particular cultural product (**Hallinan**; **Stiphras**, 2016).

At first, *Netflix* operated as a multinational with branches in different territories and classified its audience by basic demographic characteristics. The transition to a preference-built audience is first mentioned in 2016, in a *Netflix* press release explaining how a global approach to recommendations was carried out (**Gómez-Uribe**, 2016). The expression "taste communities" was used there referring to groups of people based on shared audiovisual preferences. This new criterion marked a profoundly significant transition for the future of the company, switching from national audiences (one for each territory in which the company operated) to working with a large global audience, subject to additions and removals based on tastes (**Iñigo-Daw**, 2017; **Shimpach**, 2020; **Neira**; **Clares-Gavilán**; **Sánchez-Navarro**, 2020). *Netflix* has publicly stated the estimated number of taste communities (over 2,000) and the average number to which a user belongs (from 3 to 4), but little else is known about their composition and operation (**Shattuc**, 2020). Taste communities are artificially constructed user groupings based on shared audiovisual preferences, information the system obtains from their viewing patterns. In *Netflix*, these groups include individuals from different geographical locations, as the binding element is taste, not the origin of the production or its cultural connection to the user, which is no longer relevant. The service has produced a strategy that blurs the barriers these two components might raise between customers and content. In *Netflix*, users lose their social characteristics and attributes and are given a new algorithmic identity, based on viewing preferences, which the system understands as a statistically based concept and the result of market research processes (**Cheney-Lippold**, 2011).

As with content, for *Netflix* taste has several layers (**Iñigo-Daw**, 2017) and can be broken down into an infinite number of attributes, then repackaged and personalised to adapt to the interests the user has shown. In the end, what the company is looking for is new entry flows into programming, a practice similar to linear television: it assumes that a spectator who likes a certain programme will tend to accommodate similar ones (**Jenner**, 2018). As Shapiro notes,

> "This gesture amplifies neoliberal competition because as these clusters are formed based on proprietary algorithms, viewers have no sense of how their microscopic consumption choices relate to anyone else's" (**Shapiro**, 2020).

Such post-demographic profiling, to use the term in **Rogers** (2013), has enabled *Netflix* to develop a truly international strategy by broadening the entry data (collecting information by territory but returning it to customers globally). It has also helped its configuration as television and a transnational brand, changing the logic implicit in the production and distribution of media products, which now also target a transnational audience (**González-Bernal**; **Roncallo-Dow**, 2015; **Jenner**, 2018; **Siles** *et al.*, 2019; **Lobato**; **Lotz**, 2020).

5. Glocal content strategy

Netflix is a good example of the switch to algorithmic logic in production and distribution strategies (**Nieborg**; **Poell**, 2018), closely aligned to obtain the largest audience possible for their original content. Indeed, how *Netflix* mines its audiences and recommends its content has enabled a growing number of local non-English-language productions to be well received beyond their local markets of origin. This also tends to generate a domino effect: global popularity of local content operates as a dragnet for similar content, as the metadata will be "rewarded" by the recommendation algorithms and show other content sharing the same metadata to the same audiences.

This global-local attraction (**Bielby**; **Harrington**, 2008), thanks to the company's processes, means that dozens of local productions have obtained good, or even better, figures in international territories than in their place of origin. For instance, the Brazilian production *3%* (2016) obtained 50% of its total audience outside Brazil and the German *Dark* (2017) had a 90% non-German audience and appeared in the *Top 10* most viewed programmes in 136 countries (**Manjoo**, 2019). It is worth noting that one of the major achievements of glocal content is that it is eroding the lack of permeability for foreign-language content among viewers in the United States. As **Limov** (2020) notes, audiences in the US now have unprecedented levels of access to foreign content (thanks to global platforms that produce and acquire locally) which are facilitating new cultural affinities.

As shown in table 3, the popularity of non-English-language content in *Netflix* is irrefutable. Taking the information released by the company on its *Netflix Top 10* website between June 2021 and December 2022, English-language television series obtained a total of 26,389,780,000 hours while non-English-language series provided 16,297,240,000 hours to the total. This means that, during the 19-month period analysed, television series in languages other than English provided 38% of the most popular programmes, based on hours viewed.

Table 3. Most popular glocal shows based on total hours viewed

TV shows (non-english)	Hours viewed (total)	# Weeks in 10 (accumulated)
Squid Game: Season 1	2.289.500.000	20
Money Heist: Part 5	905.230.000	14
Café con aroma de mujer: Season 1	813.480.000	28
Extraordinary Attorney Woo: Season 1	662.090.000	21
All of Us Are Dead: Season 1	659.510.000	11
The Queen of Flow: Season 2	463.470.000	16
Hometown Cha-Cha-Cha: Season 1	300.580.000	16
Yo soy Betty, la fea: Season 1	297.560.000	27
Business Proposal: Season 1	279.110.000	13
The Marked Heart: Season 1	272.750.000	7
Til Money Do Us Part: Season 1	269.260.000	7
Alchemy of Souls: Season 1	239.720.000	15
Newly Rich, Newly Poor: Season 1	201.120.000	13
My Name: Season 1	194.140.000	5
Carinha de Anjo: Season 1	180.950.000	15
High Heat: Season 1	178.860.000	6
The Five Juanas: Season 1	177.850.000	6
The Cook of Castamar: Season 1	173.470.000	8
Elite: Season 5	172.640.000	5
Twenty Five Twenty One: Season 1	171.610.000	10

Data: *Netflix Top 10*

Table 4. Glocal content travelability based on presence in top 10 per country

TV Shows (non-english)	Number of countries (presence in *Top 10*)
Squid Game	94
All of Us Are Dead	94
Money Heist	93
My Name	91
The Marked Heart	81
The Five Juanas	78
Elite	76
The Cook of Castamar	75
High Heat	59
Business Proposal	58
Extraordinary Attorney Woo	57
Alchemy of Souls	41
Hometown Cha-Cha-Cha	40
Twenty Five Twenty One	33
The Queen of Flow	31
Café con aroma de mujer	19
Newly Rich, Newly Poor	19
Til Money Do Us Part	18
Yo soy Betty, la fea	16
Carinha de Anjo	2

Data: *Netflix Top 10*

The travelability rate is just as interesting. As shown in table 4, the data provided by the *Netflix Top 10* website show that the 20 most popular non-English-language television series between June 2021 and December 2022 travelled to an average of 53.75 countries. The number of countries to which content travels has become a measure of global popularity for the company and a top order promotional element.

The glocal concept has become a constant in the discourse of *Netflix* content managers. In an interview with *Vanity Fair*, Bela Bajaria, the Chief Content Officer at *Netflix*, highlighted that the chief value of the glocal concept is the diversity it brings to the global market, as it allows *Netflix* to export around the world

> "lots of different kinds of lives reflected on-screen, and having these stories told in that way, and people who look and speak in different languages" (**Littleton**, 2020).

In much the same vein, Francisco Ramos, *Netflix Latam* Vice-President of *Original Content*, in statements to *Ventana Sur*, highlighted that having production from all parts of the world is a major advantage for the company (**Lang**, 2020).

The fact that local content is capable of satisfying audiences in different countries explains not only its significance in the company's master plan but also *Netflix*'s interest in international territories, where its competitive position is strengthened through a strategy without competitors at this scale. In this sense, glocal content helps achieve various goals (**Jenner**, 2018; **Shatucc**, 2020; **Lobato**; **Lotz**, 2020):

- Consolidating its leadership position outside the USA.
- Optimising investment, as production costs are lower in these territories, and many have a network of highly beneficial tax incentives.
- Boosting local creative prestige by opening production centres in territories that are the source of the company's great glocal hits. This is the case of the *Netflix* production hub in Madrid, which opened in 2019 after the success of *Money Heist* and which recently started enlarging its facilities to become *Netflix*'s largest studio in the EU.
- Reinforcing its identity traits, thanks to a unique offer that has managed to open a breach in the major catalogues of the overwhelmingly Anglo-Saxon tradition.
- Integrating into the local audiovisual industry. Investing in the creative fabric of each country works as a public relations campaign to combat constant accusations of lack of diversity in the stories it funds.

A key aspect for understanding how so much local content can become internationally popular is the globalisation of distribution. *Netflix Originals* premier globally, thus concentrating viewership, while *Netflix* connects taste communities to specific content elements regardless of their location. If one also considers the Internet factor, which whereby customers use the technology to expand their social contacts and connect globally (**Lull**, 2021), the implications are extraordinary. *Netflix* has become an echo chamber with a clear impact: viewership is concentrated, conversations start to flow, algorithms reward popularity leading to more views, and all this noise functions as a powerful claim to attract more customers.

6. Techniques to boost content *travelability*

The audiovisual product value chain is organised into a series of strategies, rolled out at different stages, aimed not only at obtaining market knowledge but also attracting the public. As **Linares** (2009) notes, despite the complexity and disruptions caused by digitisation, the process has maintained a stable structure for decades.

In the project preparation phase, the so-called initial sub-phase plays a key role in clearly identifying the potential public and market. In the case of *Netflix*, it has helped identify three key elements for testing the working hypothesis (H1): how production and development decisions are made, how audience prototyping is conducted and the distribution strategy**.** In the launch phase, special emphasis is placed on activities aimed at capturing and attracting the public, included in the sub-phases of reputation, attraction and memory. Elements such as marketing and promotion strategies, use of recommendation algorithms, popularity rankings and social conversation clearly fit into this phase. Given that this study focuses on the global *travelability* of local *Netflix* content, which involves different sources and target languages, incorporating dubbing and subtitling is considered pertinent as an eighth element in this strategy (O1).

As shown below, *Netflix*'s actions in these eight work areas to boost content travelability involve different fields of action (local and/or global) (O2).

Table 5. Actions carried out by *Netflix* to boost content travelability and fields of implementation

Glocal strategy	Field	
Creation and production	Local	
Audience profiling		Global
Distribution strategy		Global
Languages (dubbing and subtitling)	Local	
Marketing and promotion	Local	Global
Recommendation algorithms		Global
Popularity rankings	Local	
Social conversation	Local	Global

Creation and production (local)

The boost to local content with a global outreach starts with the decision on whether to give the project the green light. The company has appointed executives who make these decision in each territory and in language (**Low**, 2020). The aim is to make faster, better-grounded decisions. It also aims to ensure there is knowledge on the ground to validate the storytelling, always bearing in mind the elements that give content travelability to other countries. Repeating projects working with the same production companies in each territory confirms that *Netflix* tends to renew its confidence in the architects of their global successes (creators and producers). In Spain, for instance, *Netflix* has filmed in all the autonomous communities through 40 national production companies, generating 70 new local productions from the start of original production in Spain to 2022 (**Neira**, 2022).

Audience prototyping (global)

Projects are also assessed by the size of their potential audience, estimated by considering the content attributes (genres, actors, format, themes, metadata, etc.) and the interests of the platform taste communities, regardless of their geographic location. As members of the *Netflix* data science team explained, such analysis can even include how the audience will be spread geographically and determine, for instance, which country or countries will drive the programme initial audience (so-called early watchers). Managing this information beforehand greatly simplifies the subsequent promotion work, as it can be scaled to the territories the data suggest are worth reinforcing first (**Dye** *et al*., 2020).

Distribution strategy (global)

The boost to glocal content is also the result of an original distribution strategy. Simultaneous premiers of *Netflix Originals* in all 190 countries where the service is available helps create global cohesion among territorial audiences (**Jenner**, 2018). This multiplies the popularity of the content in taste community digital exchange spaces, such as social media, check-in apps (i.e. *JustWatch*), thereby spreading the phenomenon more homogenously around the world.
https://www.justwatch.com/es/series

As **Limov** (2020) explains, accessibility (the content is available, can be discovered and is attractive) combined with cultural affinity (audiences are now more mature and not put off by programmes in a foreign language) explain this greater willingness to discover new content.

Languages (local)

As **Jenner** (2018) points out, translation and dubbing permits greater integration into the target national culture. Hence it may be concluded that language is another element contributing significantly to promoting glocal content. Such language-related practices provide *Netflix* with "domesticated" content which makes the service more attractive to national audiences (**Wayne**; **Castro**, 2021).

Currently, *Netflix* subtitles in 37 languages and dubs into 34. In 2021 alone, *Netflix* subtitled 7 million minutes and dubbed 5 million. According to *Netflix*, ensuring high-quality dubbing and accurate adaptation of subtitles is essential for faithfully reproducing the creative and cultural essence of content and, above all, connecting with users. In this, there is a point of contact with the local community, as hiring actors in each country of origin helps adapt the content to incorporate cultural subtleties much more successfully than through translation and subtitling alone (**Barra**, 2013). Furthermore, the company has a global network of specialist partners to obtain optimum quality standards, while large amounts of resources go to understanding, contextualising and assessing all materials and content. Finally, the company provides various channels to receive feedback and comments from users.

Marketing and promotion (global and local)

The proximity factor in the *Netflix* communication strategy has caught the attention of the academic community, especially in recent years. As **Fernández-Gómez**, **Feijoo** and **Martín-Quevedo** (2022) note, one can detect products to which *Netflix* gives a high degree of cultural proximity in countries as diverse as Mexico, Brazil, Israel and South Korea.

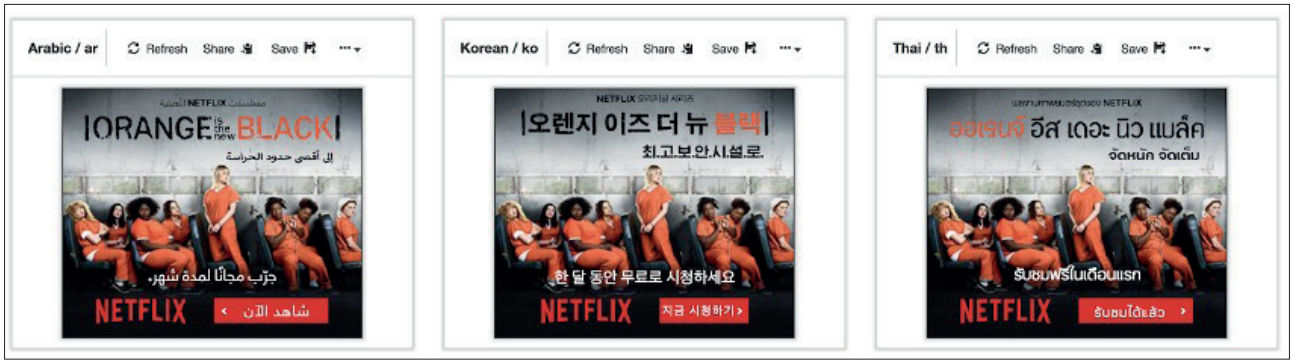

Image 1. Adaptation of *Netflix Original* artwork to different territories.
Source: *Netflix Tech Blog* (*https://netflixtechblog.com*).

Images 2, 3, 4 and 5. Stills from *Stranger Things* promotional videos in Brazil, Mexico, Colombia and Spain.

According to **Parulekar** and **Krishnan** (2018), the aim is to "create demand" for original content, to which end the creative and technology departments work hand in hand. Promoting *Netflix Originals* in so many languages, with different concepts and messages, involves millions of marketing elements, a process that is largely automated and involves large-scale campaigns adapted to different territories.

In addition, *Netflix* employs a content localisation and quality control officer whose team work to localise their product strategy, which involves working with translators to match key names and sentences to the local environment (**Shattuc**, 2020). Promotional campaigns, be they for English or non-English content, seek to bring the global product closer to each territory by adapting it to the cultural conventions of each country (**Neira**; **Clares-Gavilán**; **Sánchez-Navarro**, 2020). This results in specific actions that combine daily activity in the company's social media accounts in each territory, acting as amplifiers for different local characteristics in its global brand.

By way of example, the marketing for the second season of *Stranger Things* involved a common thread of 1980s icons in different territories, such as Leticia Sabater in Spain, Xuxa in Brazil, a famous cartoon advert for sweets for promotion in Colombia and "La Chilindrina", a popular character from the series *El Chavo del Ocho*, in the promotion in Mexico.

Recommendation algorithms (global)

While local marketing and promotion adapt content to the local characteristics of the territory outside the platform (on the Internet, in the street, on social media, etc.), the algorithms work to bring the content to as broad an audience as possible directly through the platform. In practice, this produces "mutual domestication" between users and recommendations (**Siles** *et al*., 2019) through mechanisms to ensure the content is viewed. The system also works globally by integrating local content into personalised categories and interfaces to connect to as many potential viewers as possible.

Popularity rankings (local)

Another aspect that provides special visibility to local content are the lists of the most popular programmes by country, a highly efficient selection for boosting plays (**Neira**; **Clares-Gavilán**; **Sánchez-Navarro**, 2021). When content enters the *Top 10* most watched content in a country, this reinforces visibility and creates focuses for popularity. For many global phenomena, the initial spark comes from such local blooming of popularity.

Conversation (global and local)

Viewer communication rituals have a major influence on increasing receptiveness to local content. The release formulas (all at once and at weekends) seek integration into users' routines to increase the chances of concentrating viewership, thereby generating a large volume of conversation. Another factor that helps boost the glocal concept is conversations transcending the private sphere and entering users' public discourse, creating a sensation of familiar solidarity (**Lull**, 2021). Such online activism helps integrate the content in question into the digital ecosystem much more widely and creating highly valuable recommendations, beyond the company's official promotion.

> Promotional campaigns, for both English and non-English content, seek to bring the global product closer to each territory by adapting it to a country's cultural conventions

7. Conclusions

This research focusses on identifying and analysing strategies that help local, non-English-language *Netflix* television series obtain huge global popularity (O1 and O2), to ascertain whether this phenomenon is the result of actions in different work areas, some global and others local, which may be described as a glocal strategy (H1).

The results of the research confirm this hypothesis. Interesting conclusions can be drawn using information from the *Netflix Top 10*, the website where the company provides weekly information on total viewer hours for its 10 most popular programmes (English and non-English-language films and television series). With regard to the object of study in this article (fictional series), the total share for non-English-language television series was 38% of the total for the most popular *Netflix* programmes in the period June 2021-December 2022. Furthermore, content travelled to an average of 53 countries beyond the country of origin. From these figures, it may be concluded that the company is able to generate international audiences for their local foreign-language content.

These results open up new, complementary lines of research to studies that previously exposed the lack of transparency in streaming platforms and the bias their data impose on academic research (**Quintas-Froufe**; **González-Neira**, 2016; **García-Leiva**; **Albornoz**, 2017; **González-Neira**; **Quintas-Froufe**; **Gallardo-Camacho**, 2020), given that the data for this study, from the *Netflix Top 10* website, undergoes an annual external and independent audit.

The travelability of local content stems from the various factors and lines of action employed by the company:

- Access and exposure to content in over 190 countries and 232 million customers. This facilitates simultaneous global distribution, as opposed to the international market-by-market sales-based distribution system.
- The way recommendations are made, based on preferences and tastes, rather than demographic profile or place of origin. Algorithms multiply contact points between content and viewer, automatically displaying all content that matches users' preferences, regardless of geographic or demographic factors.
- Specific local or global work dynamics, as required. The local aspect brings content closer to the territory and has a specific weight in areas such as contracting teams to carry out production, dubbing and subtitling and promotion. By contrast, the global aspect boosts popularity in international territories thanks to actions in key areas such as distribution (all at once and worldwide, thereby creating global cohesion among all territorial audiences), the recommendation system (based on audiovisual preferences and ignoring geographic barriers) and social conversation (which circulates and leaves its mark globally, although it is coordinated locally).

The good global reception for non-English-language series reaffirms *Netflix* with regard to the enormous potential of local storytelling to satisfy diverse audiences and take on Hollywood with different narrative codes from those that have dominated the audiovisual market for decades. With regard to future research, it would be worthwhile conducting more case studies on the weight of local content with a global reach in the catalogues of other global SVOD platforms and how this trend will affect the audiovisual diet of western viewers.

> "The good global reception for non-English-language series reaffirms *Netflix* on the enormous potential of local storytelling to satisfy diverse audiences and take on Hollywood with different narrative codes from those that have dominated the audiovisual market for decade"

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Consumption of information and citizen's perception of the sources consulted during the Covid-19 pandemic: A study of the situation based on opinion polls

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Abstract

The aim of this cross-sectional study is to analyze the consumption of information about coronavirus disease 2019 (COVID-19) in Spain and to ascertain the public's perception of the role of journalists, the media, the scientific community, and governmental and health authorities. The methodology involved taking a descriptive survey of a sample of 1,800 people who were representative of the Spanish population, were of legal age, and were residents of the 17 autonomous communities, between June 6 and 22, 2022. Age, political leaning, attitude toward vaccines, and level of education were determining variables. The results show that ideology and age are the factors that most condition the use of different types of information sources. Centrists consume more traditional media than those on the political left or right, who are the least likely to obtain their information from traditional media. And left-wingers rely more on official sources, such as health authorities, in contrast to centrists or right-wingers. Anti-vaccinationists (anti-vaxxers) prefer alternative sources. Meanwhile, the use of sources does not differ between men and women. Their consumption behavior is similar, which shows that gender is not a variable that significantly influences information consumption, neither in the selection of sources nor in the perception of the role of science and journalism. In general, the main sources of information consulted during the COVID-19 pandemic were the traditional media and the health authorities. In the context of the pandemic, young people consumed the least information and expressed the greatest distrust in journalism and science.

Keywords

COVID-19; Coronavirus; Epidemics; Journalism; Media; Social networks; Social media; Disinformation; Fake news; Infodemic; Disinfodemic; Information sources; News sources; Science; Health; Surveys; Public opinion.

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1. Introduction

1.1. Theoretical and contextual framework

Health is fertile ground for creators of disinformation, especially on the Internet (**Daraz** *et al.*, 2019) and particularly on social networks (**Naeem**; **Bhatti**; **Khan**, 2020), which can generate individual or collective pseudo-knowledge (**Introne** *et al.*, 2018). The coronavirus disease 2019 (COVID-19) pandemic created a situation conducive to the spread of hoaxes, manipulated content, conspiracy theories, and disinformation, and posed one of the greatest global threats to public security and well-being in recent decades (**Quian**, 2023). The mass spread of false, manipulated, or erroneous information, in the form of a disinformation pandemic, or disinfodemic, put the scientific community on alert, as it was concerned about the negative societal impacts that this disinfodemic would cause (**Gallotti** *et al.*, 2020; **Jolley**; **Lamberty**, 2020; **Patel**; **Kute**; **Agarwal**, 2020; **Solomon** *et al.*, 2020; **Zarocostas**, 2020). Additionally, this alert was issued by the *World Health Organization* (*WHO*), by its Director-General, Tedros Adhanom Ghebreyesus, who acknowledged that

> "we're not just fighting an epidemic; we're fighting an infodemic. Fake news spreads faster and more easily than this virus" (*The United Nations Department of Global Communications*, 2020).

The *WHO* thus recognized for the first time the dangers and threats of health-related viral disinformation phenomena (disinfodemics) and the importance of infodemiology as a scientific field, more than two decades after the genesis of infodemiological studies, which **Eysenbach** (2020) places in 1996. Recognizing the global threat posed by the disinfodemic in the context of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic prompted the *WHO* to create a website with information fact-checked by the scientific and health community, which has acted as a means to debunk disinformation about COVID-19 (**Zarocostas**, 2020).

Eysenbach (2002) coined the term "infodemiology" to conceptualize the epidemiology of (dis)information, but 18 years passed before this concept gained scientific relevance with the COVID-19 pandemic. In this context, two phenomena –infodemics and disinfodemics– coexist. Infodemics (information + epidemic) are described as information epidemics, in which huge volumes of information circulating on the Web overstrain people's ability to discern whether the sources are reliable or not and whether the information received is true or false. In addition, information saturation impacts social dynamics during a health crisis and may even increase the spread of the natural epidemic (**Gallotti** *et al.*, 2020; **Tangcharoensathien** *et al.*, 2020; **Tomes**, 2020). The newer concept of a disinfodemic (disinformation + epidemic) limits the focus exclusively to the virality (on an epidemic or pandemic scale) of fake news, manipulated content, conspiracy theories, and any disinformation strategy or product aimed at generating confusion about medical science, and can be more toxic and more lethal than disinformation on other topics (**Posetti**; **Bontcheva**, 2020a,b). Therefore, the term "disinfodemic" seems appropriate when discussing viral disinformation phenomena related to human health and the scientific health field (**Quian**, 2023).

In the scenario of a global pandemic, there are warnings regarding conspiratorial, denialist, and populist disinformation strategies used to discredit the scientific health authorities, to undermine confidence in health institutions and programs (*The lancet infectious diseases*, 2020), and to

> "create fear, rumours, and prejudice that jeopardise our global collaboration in the fight against this virus" (**Calisher** *et al*. 2020, p. e42).

Mian and **Khan** (2020) warn of a progressive "disconnect between scientific consensus and members of the public," fostered by the populist movements of the 21st century, political and social polarization, and attacks on science from extremist sectors –a trend that worsened in the context of the COVID-19 pandemic with the spread of disinformation on a global scale, "drowning out credible sources of information" (**Mian**; **Khan**, 2020, p. 1).

According to several studies from before the COVID-19 pandemic, there is a correlation between belief in conspiracies, rejection of science, and support for pseudosciences (**Lewandowsky**; **Gignac**; **Oberauer**, 2013; **Lewandowsky**; **Oberauer**; **Gignac**, 2013; **Lobato** *et al.*, 2014; **Van-der-Linden**, 2015; **Hartman** *et al.*, 2017; **Lobato**; **Zimmerman**, 2019). In the context of the COVID-19 pandemic, **Mian** and **Khan** (2020) also indicate that the media contributed to public disinformation and confusion because their concern was to "increase viewership" rather than to provide truthful and verified information –they were

> "creating dramatic headlines but are instead inciting panic amongst the public" (**Mian** and **Khan**, 2020, p. 1).

The scientific sectors' criticism of the media was very harsh during the pandemic; in fact, they were accused of being

> "guilty of favouring quick, sensationalist reporting rather than carefully worded scientific messages with a balanced interpretation" (*The lancet infectious diseases*, 2020).

Opposing some media outlets' recurrent use of inexpert and pseudoscientific sources (**Elias**, 2020; **Quian**, 2023), authors such as **Hauer** and **Sood** (2020, p. 3) speak of how

> "amplifying the voices of experts increases the number of people that receive accurate and up to date information about COVID-19."

These expert voices (the scientific health authorities) must serve as bastions of truth against the fabricators of lies and conspiracies, but they also must

> "resist attempts to sway their messaging to reflect institutional or political interests." (**Garrett**, 2020, p. 942).

The scientific health community has also warned of the dangers of politicizing and ideologizing the global public health crisis –polarizing the public– to profit by gaining votes (**Fraser** *et al*., 2021; **Legido-Quigley** *et al.*, 2020; **Mian**; **Khan**, 2020; **Nogrady**, 2021).

1.2. The state of affairs

In Spain, at various times throughout the pandemic, surveys similar to the one presented herein were conducted to learn about the means of information consumption that were related to COVID-19 and shaped by the pandemic environment. **Bernal-Triviño** (2020) conducted research using 830 surveys to identify changes in media access routines after one month of lockdown in Spain. The results of this work show that there was a high level of interest in the news at the beginning of the pandemic period, with the following of the media, social networks, and journalists becoming increasingly selective, and criticism of disinformation and sensationalism and their lack of ethics among media outlets. **Casero-Ripollés**, **Doménech-Fabregat** and **Alonso-Muñoz** (2023) conducted another national survey, in July 2021, with a sample of 682 people, to learn about the perceptions of Spanish citizens regarding disinformation in the COVID-19 period; the results indicated a distrust of the media and politicians. An experimental study carried out in Germany also found a distrust of scientists (**König**; **Breves**, 2021), although less than that of politicians. This distrust has led, in some cases, to harassment of and attacks on scientists (**Nogrady**, 2021; **O'Grady**, 2022).

Other studies focusing on educational aspects show that scientific literacy and political ideology are determining variables for trusting science and solutions provided by it, such as vaccines (**Allum** *et al.*, 2008; **Gauchat**, 2012; **Hamilton**, 2015, **Hartman** *et al.*, 2017), but the work of **Egelhofer** (2023) shows that populist politicians' anti-science discourse has little impact on citizens' perceptions of scientists.

Several surveys conducted in Spain and other countries also demonstrate the devastating health impacts that believing in conspiracies about COVID-19 (**Freeman** *et al.*, 2022) and the acceptance of disinformation or false information (**Roozenbeek** *et al.*, 2020) can have. For example, **Islam** *et al*. (2020, p. 1624) documented that, during the first quarter of 2020 in Iran, 800 people died, 5,876 were hospitalized, and 60 were blinded by consuming methanol as a purported antidote to SARS-CoV-2. The people concerned were persuaded by false information circulating on the Internet and disregarded the advice of the scientific and health authorities. There is also evidence that science and health content played a prominent role in shaping the spread of deception during the pandemic (**León** *et al*., 2022).

In contrast to what happens on social networks, journalists from media outlets that are considered "benchmark" media outlets, especially in the press, use credible sources or, at least, those with *auctoritas*. **Catalán-Matamoros** and **Elías** (2020) explored the main sources used by the Spanish press to report on COVID-19 vaccines, and governmental sources stood out.

1.3. Objectives

The general objective of this research is to determine what the public's perception of the sources of information consulted during the COVID-19 health crisis is and to find out how the pandemic affected public opinion and social dynamics. To this end, we conducted a survey of 1,800 citizens of legal age residing in the 17 autonomous communities of Spain. The following are established as specific objectives:

O1: To understand to what level information on COVID-19 was followed.
O2: To identify the main sources that citizens used to learn about the pandemic.
O3: To identify sociodemographic variables that can determine information consumption and opinion-forming behaviors.
O4: To identify sociodemographic variables that may determine citizens' trust or distrust in official sources, scientific and health authorities, and the media.
O5: To find out the degree of trust or distrust in science and journalism during the pandemic.

In addition, we posed several research questions, related to the objectives, which we considered necessary to pursue the topic under study:

Q1: How have Spanish citizens obtained information about the COVID-19 pandemic?
Q2: To citizens, which sources have the most credibility or trustworthiness?
Q3: Are there generational and gender differences in the ways to access and consume information, and in the perception of science and journalism?
Q4: Are education and political ideology determinant when it comes to the means of accessing information and trust in science and journalism?
Q5: Does being pro- or anti-vaccine condition how people obtain information and their perception of science and journalism?

2. Methodology

This cross-sectional study uses a descriptive survey, conducted between June 6 and 22, 2022, of 1,800 citizens who reside in the 17 autonomous communities of Spain and who have an age range between 18 and 80 years old. The representativeness criteria took into account the variables of sex, age, and geographic area. Quotas were set for each, and a weighting was applied to adjust them. In addition, the level of education, field of studies, and political leaning of the respondents were identified.

To set the sample representation, the data of the population were obtained from the Spanish *National Institute of Statistics* (*INE*). The 1,800 surveys that were integrated for quantitative analysis in this study were collected by random sampling, adjusting their composition according to the Spanish population at the national level and the distribution according to the autonomous communities, with a confidence level of 95.5%, a variability of $p = q = 50\%$, and a margin of sampling error of ±2.34%.

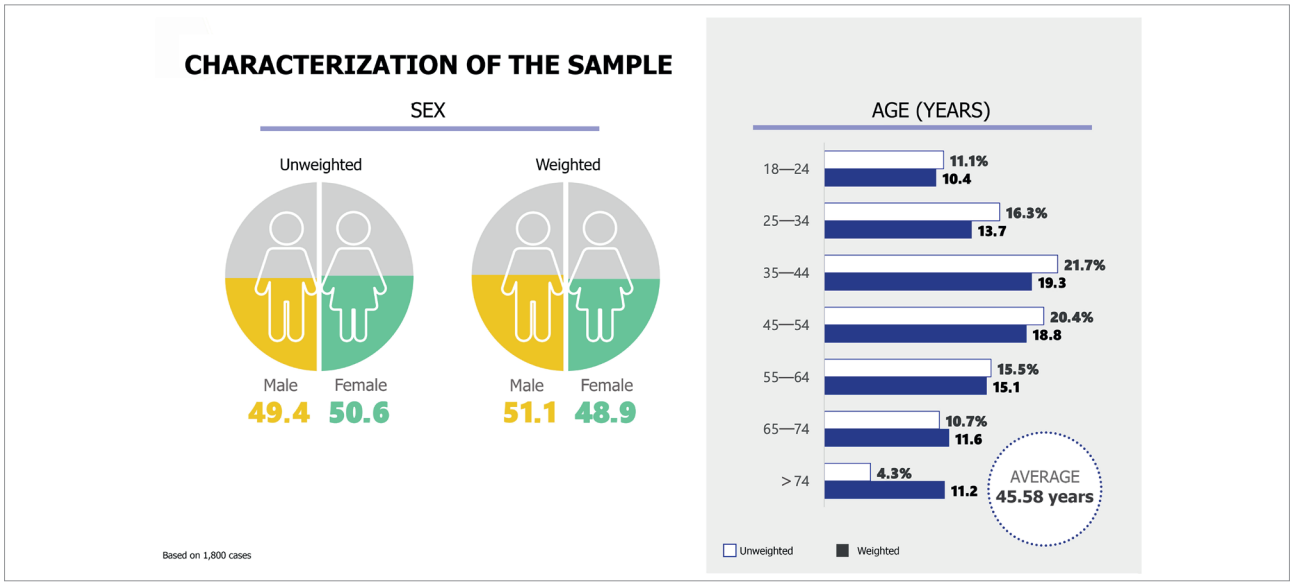


Figure 1. Characterization of the sample according to sex and age

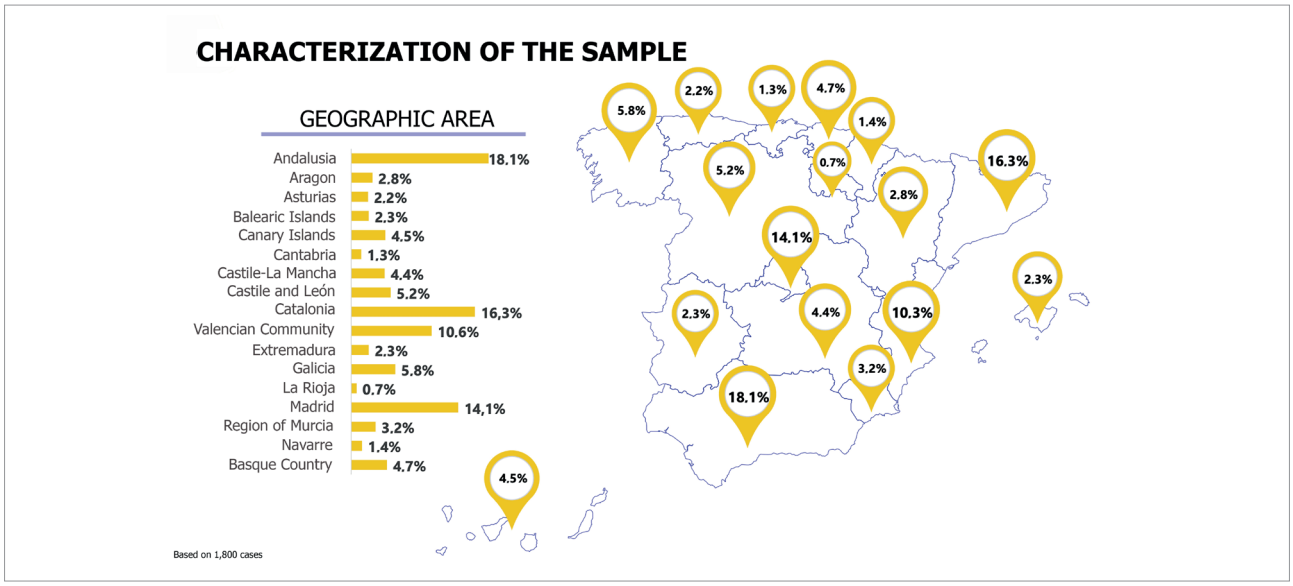


Figure 2. Characterization of the sample according to autonomous community

Data collection was carried out through an online survey, following the *Computer assisted web interviewing* (*CAWI*) method, through a consumer panel. This computer-assisted model allowed individuals to self-administer a structured questionnaire with closed-ended questions.

Respondents were guaranteed that their answers would stay anonymous, and the *ISO 20252* standard and the *CCI/ESOMAR Code of Conduct* were applied to maintain the rigor and quality of the research.

Descriptive surveys are useful for obtaining, in the early stages of research, information about specific phenomena affecting large populations (**Malhotra**; **Grover**, 1998; **Rea**; **Parker**, 2014; **Rossi** *et al.*, 2013), and they provide an appropriate level of clarification about respondents' characteristics, opinions, attitudes, and preferences (**McMurray** *et al.*, 2004). And although this method does not draw correlations or causal relationships, it does effectively portray the phenomenon being researched and allows evidence to be obtained through data collection on particular issues, which can be used for future decision-making (**Oppenheim**, 1992).

2.1. Characterization of the sample

The survey data presented below (Figures 1, 2, 3, and 4) describe the research sample according to the variables of gender, age, autonomous communities, level of education, and political leaning.

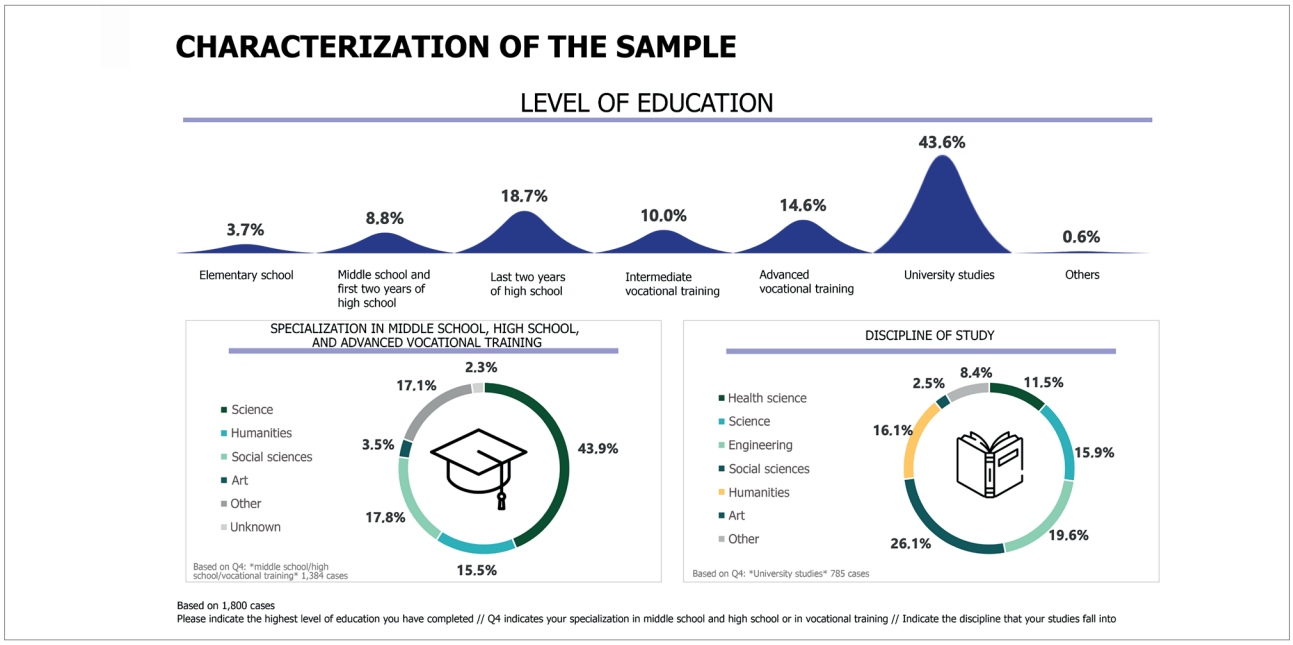


Figure 3. Characterization of the sample according to level of education

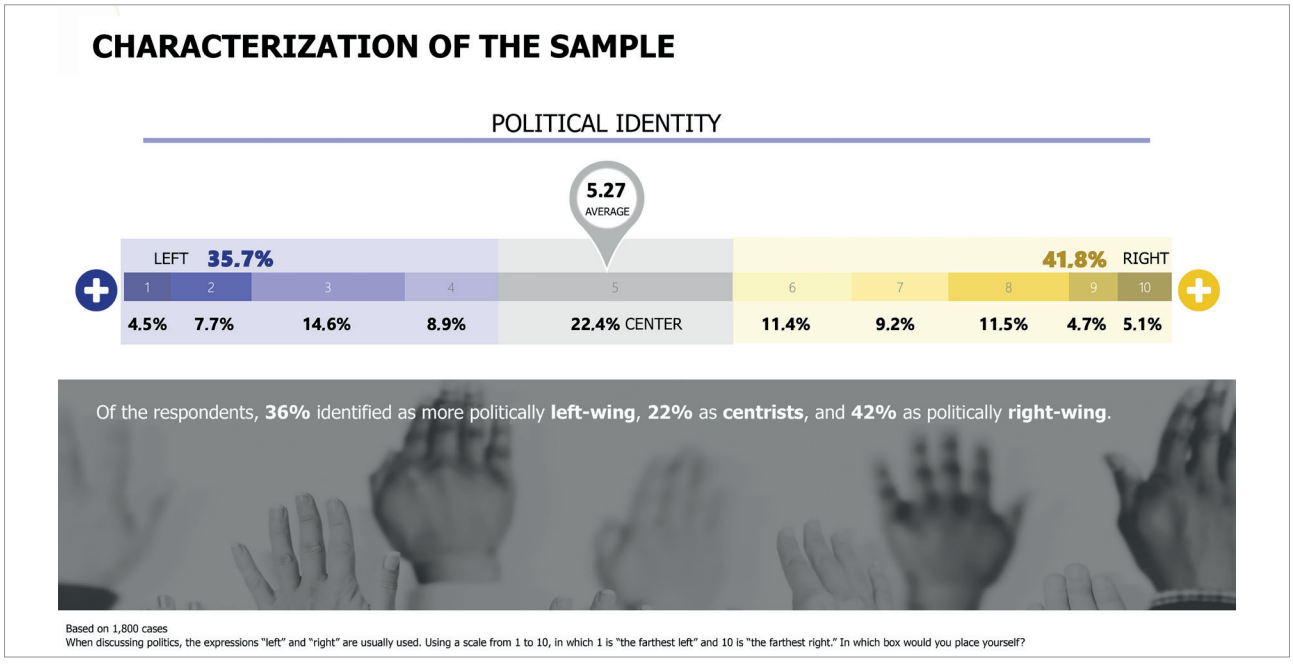


Figure 4. Characterization of the sample according to political identity

This is a representative sample based on *INE* data, in which women outnumber men (51.1% versus 48.9%), the average age of the respondents was 45.58 years, and the autonomous communities with the highest population weight were Andalusia (18.1%), Catalonia (16.3%), and Madrid (14.1%).

Data on level of education showed that 43.6% had a university education and only 3.7% had not gone beyond elementary school.

The political characterization of the surveyed population showed that, on a scale of 1 to 10, where 1 is "far left" and 10 is "far right," the average was ideologically centrist (5.7 out of 10), although there were more people on the right (41.8%) than on the left (35.7%).

Once the sample had been defined according to sex, age, autonomous community, level of education, and political leaning, the variable "vaccination" (Figure 5) was considered to determine the percentage who were vaccinated and the respondents' attitudes toward COVID-19 vaccines, so as to relate it to the use of information sources. In the period analyzed, only 6.4% of the respondents had not been vaccinated, and 1% did not want to reveal whether they had been vaccinated or not. Some 80.4% had already received the full regimen.

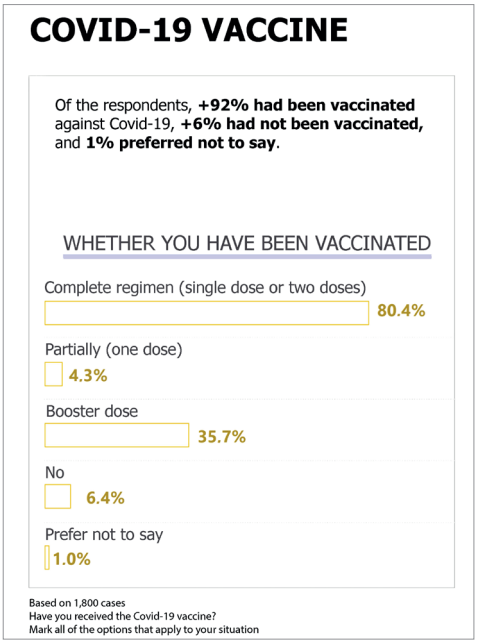


Figure 5. Characterization of the sample according to COVID-19 vaccination

2.2. Following of news, sources, and degree of trust/distrust

To obtain data on respondents' attitudes and information-seeking behaviors, the following questions were asked (Table 1), the answers to which were subsequently disaggregated according to the sociodemographic variables:

3. Results

3.1. Following of news and sources of information

Of the respondents, 85.1% had followed news related to COVID-19 very closely. Only 3.6% said they had not done so. The main sources of information were the traditional media (press, radio, and TV; +26.5%) and the health authorities (+26.4%). Regarding respondents' second choices for sources of information, central, regional, and local governments (15.8%); research organizations (11.4%); and family and friends on social networks (9.2%) stood out. Regarding the respondents' first choice of source, 4.8% acknowledged having consulted alternative sources and the pharmaceutical sector (3.3%), and universities (1.9%) also appeared as minority sources.

According to gender, differences, with respect to the total, were only found between women (>11.4%) and men (<6.9%) when it came to accessing information from friends and family on social networks. And, according to age, differences, with respect to the total, were identified for young people aged 18-24 years, who showed less interest in following news about COVID-19 (<71.3%) and in the health authorities (<18.1%), for which confidence seemed to be greater in the age group 65-74 years (>33.4%).

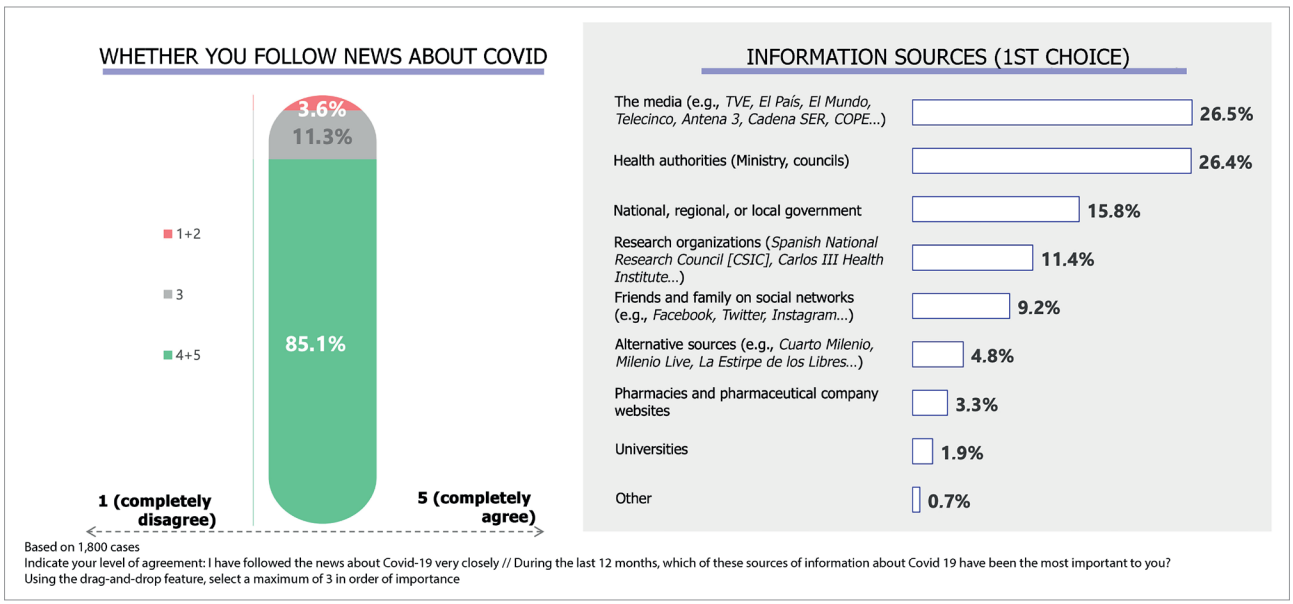


Figure 6. Monitoring of COVID-19 news and key sources of information

Table 1. Design of the questions and objectives to be achieved

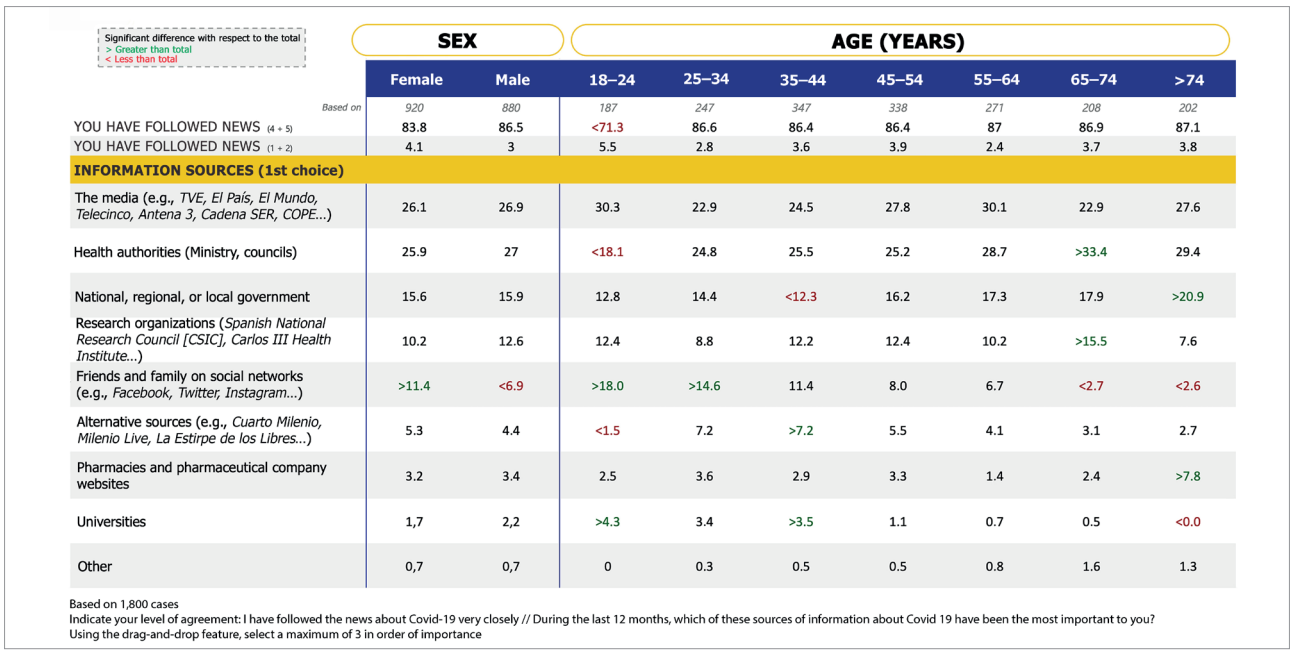
Questions	Type	Responses	Objectives
You have followed news about COVID-19.	Likert scale 1-5	1 = strongly disagree 2 = disagree 3 = neither agree nor disagree 4 = agree 5 = strongly agree	O1, O3
Sources of information used.	Multiple choice: - Friends and family on social networks - Health authorities - Pharmacies and pharmaceutical company websites - Alternative sources - National, regional, or local government - The media - Research organizations - Other	Each subject's first choice was used for the calculations.	O2, O3
Statements - Science aims to seek the truth and make it public. - The existence of news or information about the COVID-19 pandemic that distorts reality is a problem in our country. - It is advisable to have external oversight over journalism to monitor the quality of the content disseminated by the media when it comes to health matters. - Journalism aims to seek the truth and make it public. - It is easy for me to identify news or information about the COVID-19 pandemic that distorts reality or is even false. - When faced with news or information that I question, I turn to webpages, online resources, or fact-checking tools on the computer to verify information about COVID-19 (*Maldita.es*, *Newtral*, *VerificaEfe*, etc.). - The management of the pandemic (vaccination, closures of hospitality services, etc.) in your autonomous community will matter when it comes to your voting decision in the next elections. - Media coverage during the COVID-19 pandemic has created or increased stigma and discrimination against certain groups (obese people, older people, immigrants, smokers). - During the pandemic, journalists have covered COVID-19 in accordance with the ethical principles of truthfulness and impartiality. - The terminology used by the media to refer to the COVID-19 virus and vaccines has been too technical and difficult to understand. - Scientists routinely endanger humanity.	Likert scale 1-5	1 = strongly disagree 2 = disagree 3 = neither agree nor disagree 4 = agree 5 = strongly agree The 11 statements were grouped into three categories according to the degree of agreement or disagreement that they received: - TOP (more than 70% of respondents agreed) - MED (about 50% agreed/ disagreed) - BOTTOM (less than 50% agreed)	O4, O5

The younger segment, aged 18-24 years, also showed less interest in alternative sources (<1.5%), as opposed to the populations aged 25-34 years (7.2%) and 35-44 years (>7.2%). The two youngest segments were also the ones that stood out most in terms of the use of family and friends as sources on social networks (>18.0% and >14.6%, respectively), data that contrasted with a minimal use of these sources by the oldest (<2.7% in the segment aged 65-74 years and <2.6% from that aged 75 years and older). The population aged 18-24 years paid the most attention to the information provided by universities (>4.3%), and a progressive drop in the use of academic institutions was observed as age increased.

In terms of the information provided by the central, regional, and local governments, differences were found between the attention paid to it by the age group 35-44 years, which had the least confidence in these sources (<12.3%), and those over 74 years of age (>20.9%). The older segment also demonstrated the greatest confidence in pharmaceutical sources (>7.8%), with a difference of with respect to the overall sample.

Scientific research organizations had similar values in all segments, except in the 65-74-year-old segment, where confidence was higher (>15.5%).

> "Of the respondents, 85.1% followed news related to the COVID-19 pandemic very closely. Only 3.6% said they had not done so"



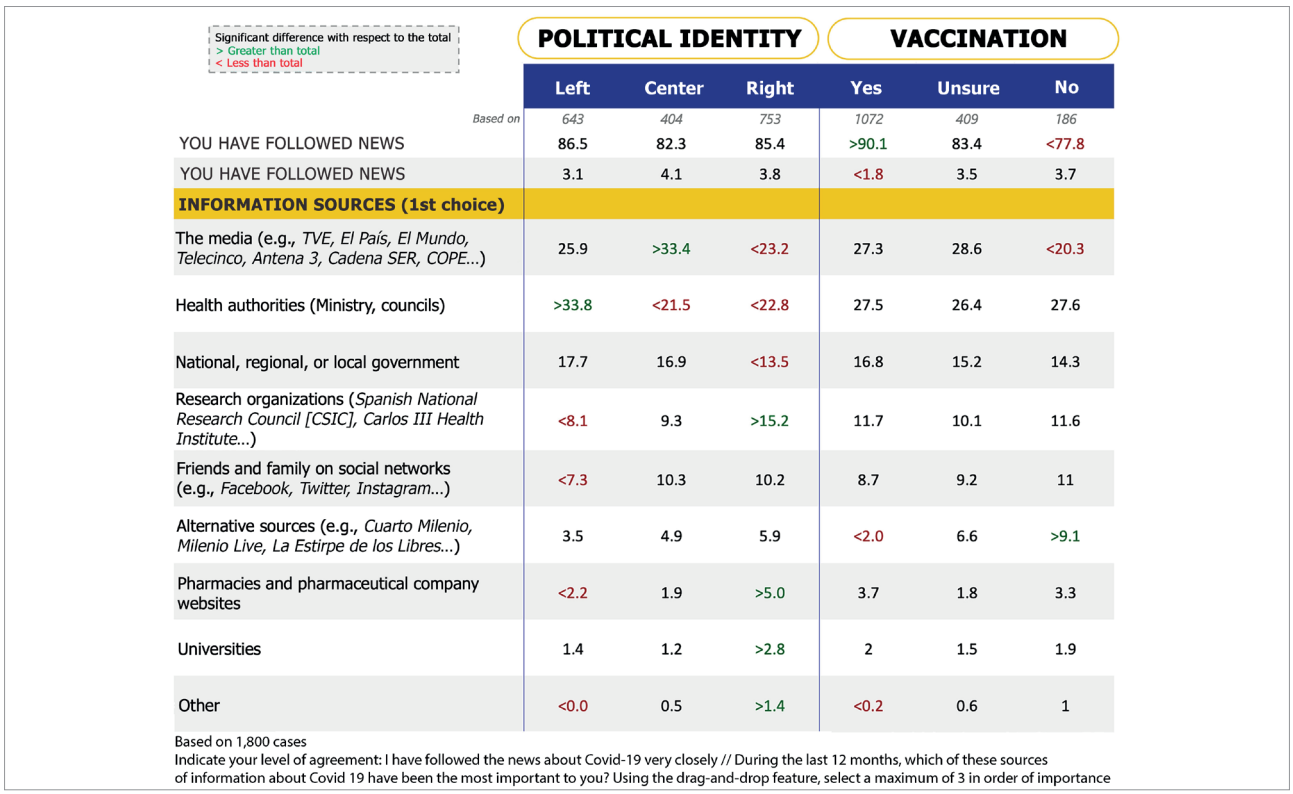
Significant difference with respect to the total
> Greater than total
< Less than total

	SEX		AGE (YEARS)						
	Female	Male	18–24	25–34	35–44	45–54	55–64	65–74	>74
Based on	*920*	*880*	*187*	*247*	*347*	*338*	*271*	*208*	*202*
YOU HAVE FOLLOWED NEWS (4 + 5)	83.8	86.5	<71.3	86.6	86.4	86.4	87	86.9	87.1
YOU HAVE FOLLOWED NEWS (1 + 2)	4.1	3	5.5	2.8	3.6	3.9	2.4	3.7	3.8
INFORMATION SOURCES (1st choice)									
The media (e.g., *TVE, El País, El Mundo, Telecinco, Antena 3, Cadena SER, COPE...*)	26.1	26.9	30.3	22.9	24.5	27.8	30.1	22.9	27.6
Health authorities (Ministry, councils)	25.9	27	<18.1	24.8	25.5	25.2	28.7	>33.4	29.4
National, regional, or local government	15.6	15.9	12.8	14.4	<12.3	16.2	17.3	17.9	>20.9
Research organizations (*Spanish National Research Council [CSIC], Carlos III Health Institute...*)	10.2	12.6	12.4	8.8	12.2	12.4	10.2	>15.5	7.6
Friends and family on social networks (e.g., *Facebook, Twitter, Instagram...*)	>11.4	<6.9	>18.0	>14.6	11.4	8.0	6.7	<2.7	<2.6
Alternative sources (e.g., *Cuarto Milenio, Milenio Live, La Estirpe de los Libres...*)	5.3	4.4	<1.5	7.2	>7.2	5.5	4.1	3.1	2.7
Pharmacies and pharmaceutical company websites	3.2	3.4	2.5	3.6	2.9	3.3	1.4	2.4	>7.8
Universities	1,7	2,2	>4.3	3.4	>3.5	1.1	0.7	0.5	<0.0
Other	0,7	0,7	0	0.3	0.5	0.5	0.8	1.6	1.3

Based on 1,800 cases
Indicate your level of agreement: I have followed the news about Covid-19 very closely // During the last 12 months, which of these sources of information about Covid 19 have been the most important to you? Using the drag-and-drop feature, select a maximum of 3 in order of importance

Figure 7. Main sources of information about COVID-19 according to gender and age group

In terms of political leaning, no differences were observed in following news about COVID-19 among the different groups, but ideology did condition the use of different types of information sources. People who considered themselves in the center of the political spectrum showed a significant positive difference, with respect to the total, in information consumption through traditional media (>34.4%), compared with those who declared themselves to be right-wing, who had a substantial negative difference, with respect to the total (<23.2%). Left-wingers were the ones who turned the most to health authorities as sources (>33.8%), whereas lower values in comparison with the other groups sample were observed for those in the center (<21.5%) and on the right (<22.8%). Among right-wingers, there were also differences when it came to consulting information offered by the central, regional, and local governments, as they had values lower than the other groups (<13.5%). However, right-wingers as a political profiles had higher values when it came to consulting information provided by research organizations (>15.2%), compared with left-wingers, who had lower values (<8.1%). The same was true for pharmaceutical sources, which were consulted more by those on the right (>5.0%) and



Significant difference with respect to the total
> Greater than total
< Less than total

	POLITICAL IDENTITY			VACCINATION		
	Left	Center	Right	Yes	Unsure	No
Based on	*643*	*404*	*753*	*1072*	*409*	*186*
YOU HAVE FOLLOWED NEWS	86.5	82.3	85.4	>90.1	83.4	<77.8
YOU HAVE FOLLOWED NEWS	3.1	4.1	3.8	<1.8	3.5	3.7
INFORMATION SOURCES (1st choice)						
The media (e.g., *TVE, El País, El Mundo, Telecinco, Antena 3, Cadena SER, COPE...*)	25.9	>33.4	<23.2	27.3	28.6	<20.3
Health authorities (Ministry, councils)	>33.8	<21.5	<22.8	27.5	26.4	27.6
National, regional, or local government	17.7	16.9	<13.5	16.8	15.2	14.3
Research organizations (*Spanish National Research Council [CSIC], Carlos III Health Institute...*)	<8.1	9.3	>15.2	11.7	10.1	11.6
Friends and family on social networks (e.g., *Facebook, Twitter, Instagram...*)	<7.3	10.3	10.2	8.7	9.2	11
Alternative sources (e.g., *Cuarto Milenio, Milenio Live, La Estirpe de los Libres...*)	3.5	4.9	5.9	<2.0	6.6	>9.1
Pharmacies and pharmaceutical company websites	<2.2	1.9	>5.0	3.7	1.8	3.3
Universities	1.4	1.2	>2.8	2	1.5	1.9
Other	<0.0	0.5	>1.4	<0.2	0.6	1

Based on 1,800 cases
Indicate your level of agreement: I have followed the news about Covid-19 very closely // During the last 12 months, which of these sources of information about Covid 19 have been the most important to you? Using the drag-and-drop feature, select a maximum of 3 in order of importance

Figure 8. Main sources of information about COVID-19 according to political identity and attitude toward vaccines

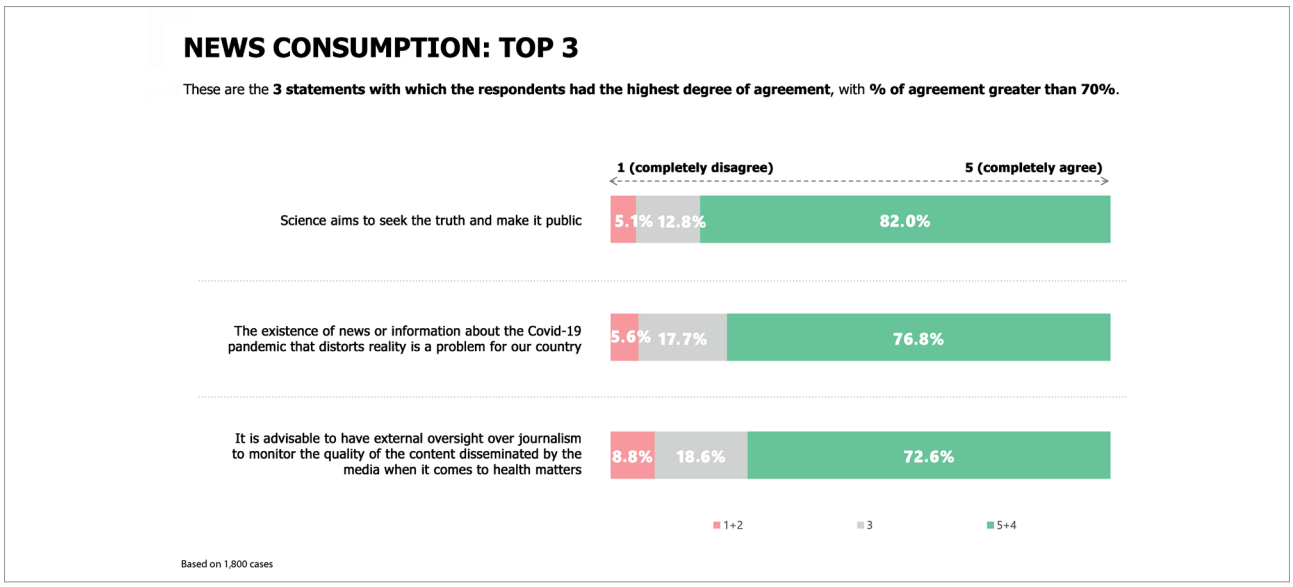


Figure 9. Degree of agreement/disagreement with TOP statements

less by those on the left (<2.2%). The latter also had the lowest values for accessing information from friends and family on social networks (<7.3%), while more conservative individuals had higher values for accessing information from university sources (>2.8%).

There were no substantial differences in the use of alternative sources according to political ideology.

Attitude toward vaccines was not, in general, a variable that revealed important differences in the use of sources, but those reluctant to receive the vaccine did have lower values when it came to consulting traditional media (<20.3%) and had a greater difference than the average when it came to the use of alternative sources (>9.1%), where those on the left also showed a lower percentage than the total (<2.0%).

3.2. Degree of trust/distrust in science and journalism

The 11 statements (S1-S11) presented to the respondents were grouped into three categories according to the degree to which respondents agreed or disagreed with them: TOP (more than 70% of respondents agreed), MED (about 50% agreed/disagreed), and BOTTOM (less than 50% agreed).

The highest degree of agreement (TOP) out of the entire sample was with these three statements:

- S1: "Science aims to seek the truth and make it public" (82.0%).
- S2: "The existence of news or information about the COVID-19 pandemic that distorts reality is a problem for our country" (76.8%).

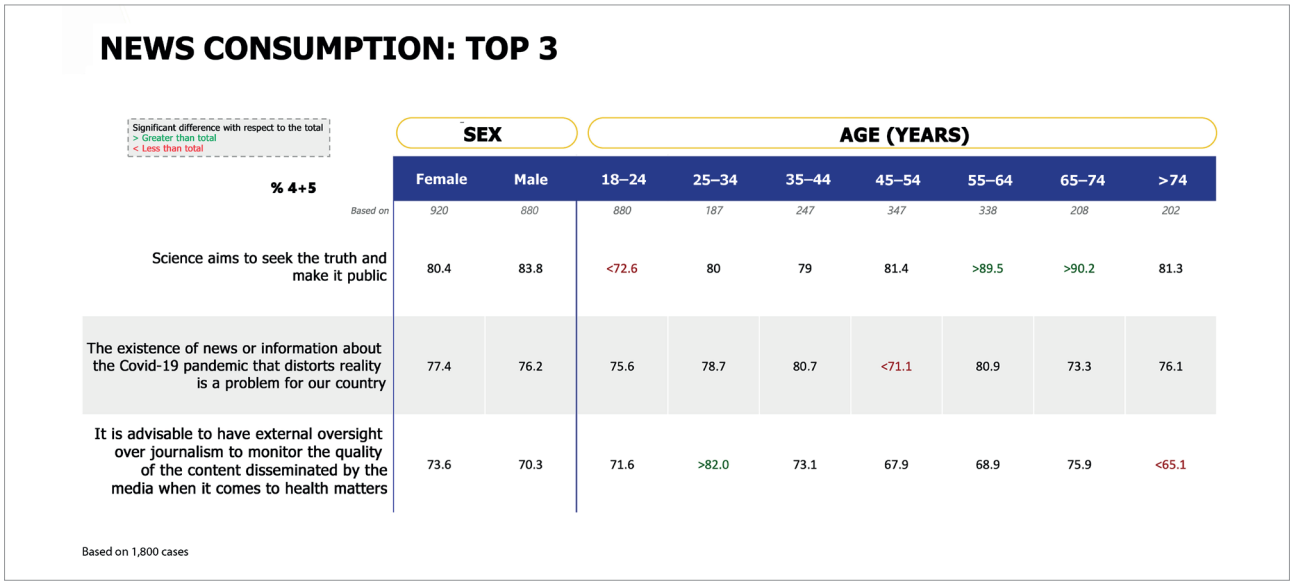


Figure 10. Degree of agreement/disagreement by gender and age for top 3 statements

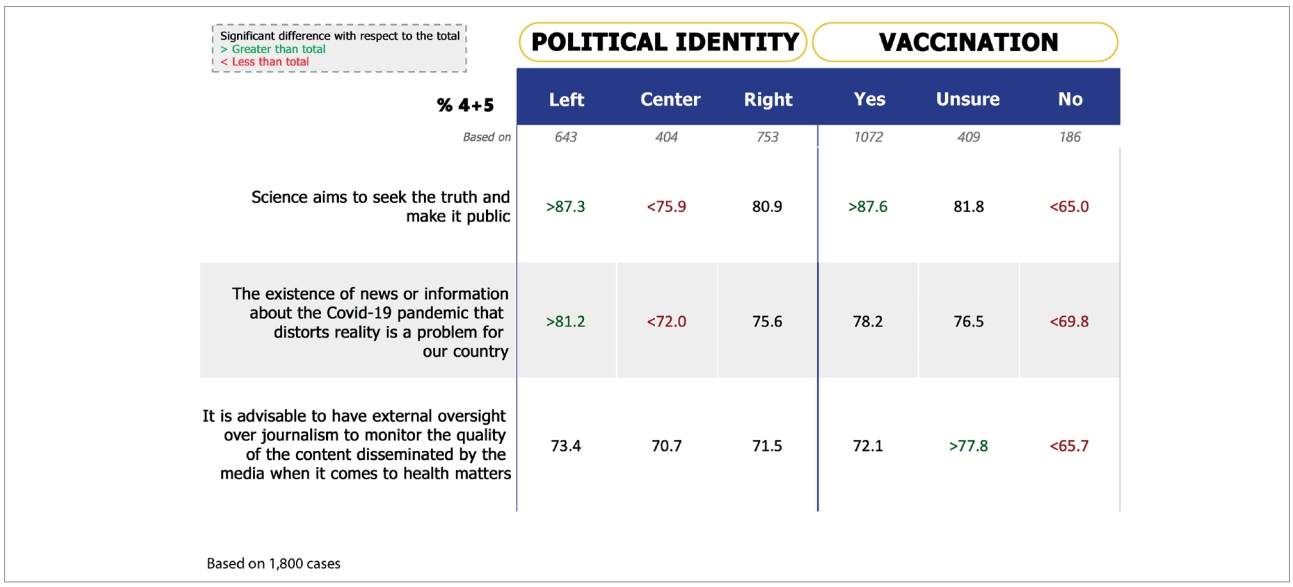


Figure 11. Degree of agreement/disagreement according to political identity and attitude toward vaccination in TOP 3 statements

- S3: "It is advisable to have external oversight over journalism to monitor the quality of the content disseminated by the media when it comes to health matters" (72.6%).

According to gender, no notable differences were found for S1, S2, and S3.

According to age, in S1 there were differences, with respect to the total, in the youngest segment, 18-24 years of age, which had the lowest degree of agreement with this statement (<72.6%), and in the groups 55-64 years (>89.5%) and 65-74 years of age (>90.2%), which had the highest degree of agreement with S1. In S2, significant differences, in respect to the total, were found only in the intermediate age segment, 45-54 years, which showed the lowest degree of agreement (<71.1%). And in S3, differences were observed in the age group 25-34 year (>82.0%) and in the age group over 74 years (<65.1%), with the highest and lowest degrees of agreement and disagreement, respectively.

According to political leaning, there were differences in S1 and S2, with respect to the total, between those who identified as left-leaning and centrist, with left-wingers showing the highest degree of agreement with S1 (>87.3%) and S2 (>81.2%), and centrists the lowest (<75.9% and <72.0%, respectively).

In the section on attitudes toward vaccination, significant differences were identified in the degree of agreement with S1 in the pro-vaccine (>87.6%) and anti-vaccine (<65.0%) groups –the degree of agreement with S2 was lower, with respect to the total, in those who rejected vaccination (<69.8%), and for S3 the degree of agreement was higher in the group that had doubts about the vaccine (>77.8%) and lower in those who rejected it (<65.7%).

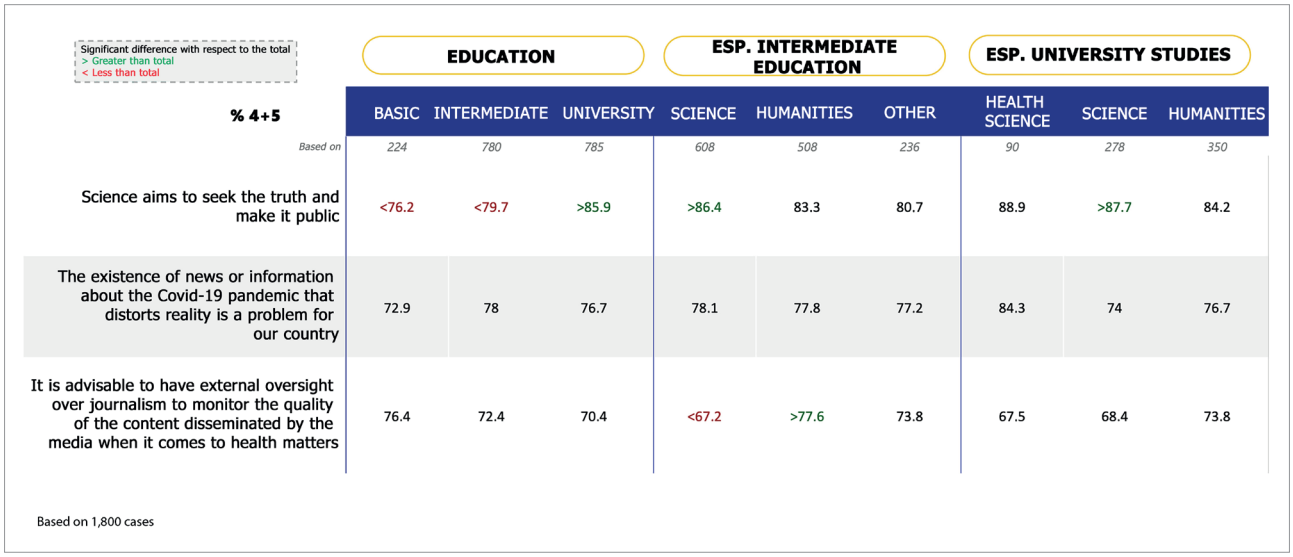


Figure 12. Degree of agreement/disagreement according to educational level and study discipline on TOP 3 statements

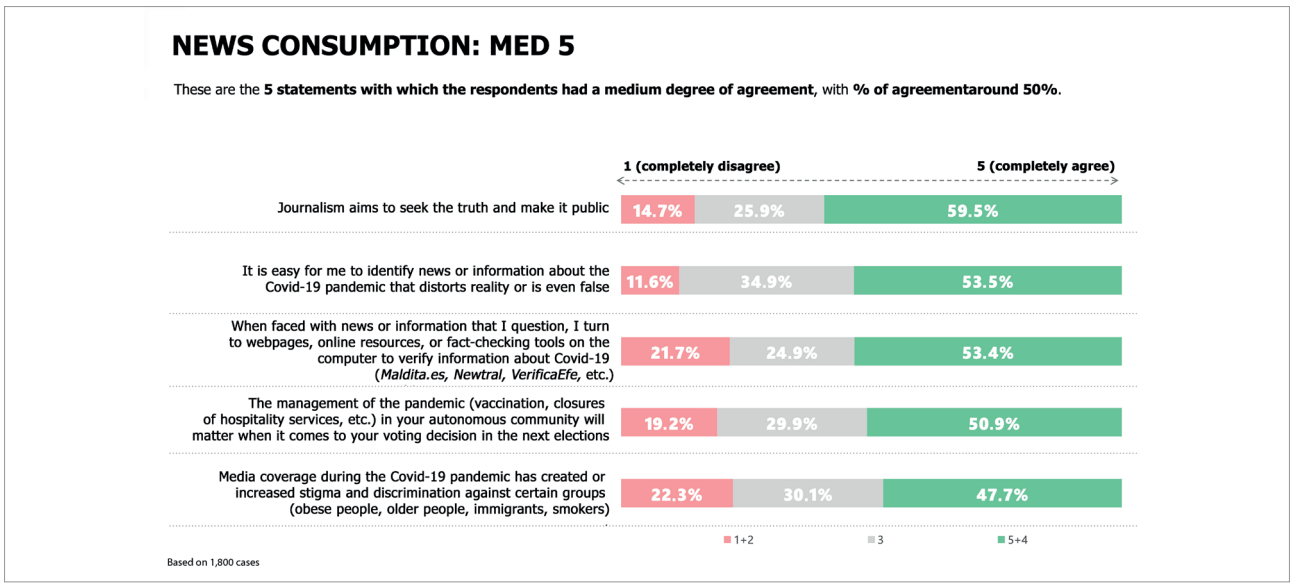


Figure 13. Degree of agreement/disagreement when it came to MED 5 statements

According to level of education, the degree of agreement with S1 was different in all groups –lower in those with basic education (<76.2%) and higher in those with university education (>85.9%)– and there were no significant differences for S2 and S3.

According to specialization, differences, with respect to the total, were found in S1 in those who specialized in science, in both intermediate (>86.4%) and higher education (>87.7%). For S2 there were no notable differences in any group, and for S3 there was a higher degree of agreement for the group with an intermediate level of education in the arts (>77.6%) and a lower degree of agreement for the group with a science specialization at the same educational level (<67.2%).

The statements with medium agreement (MED) were the following:

- S4: "Journalism aims to seek the truth and make it public" (59.5%).
- S5: "It is easy for me to identify news or information about the COVID-19 pandemic that distorts reality or is even false" (53.5%).
- S6: "When faced with news or information that I question, I turn to webpages, online resources, or fact-checking tools on the computer to verify information about COVID-19 (*Maldita.es*, *Newtral*, *VerificaEfe*, etc.)" (53.4%).
- S7: "The management of the pandemic (vaccination, closures of hospitality services, etc.) in your autonomous community will matter when it comes to your voting decision in the next elections" (50.9%).
- S8: "Media coverage during the COVID-19 pandemic has created or increased stigma and discrimination against certain groups (obese people, older people, immigrants, smokers)" (47.7%).

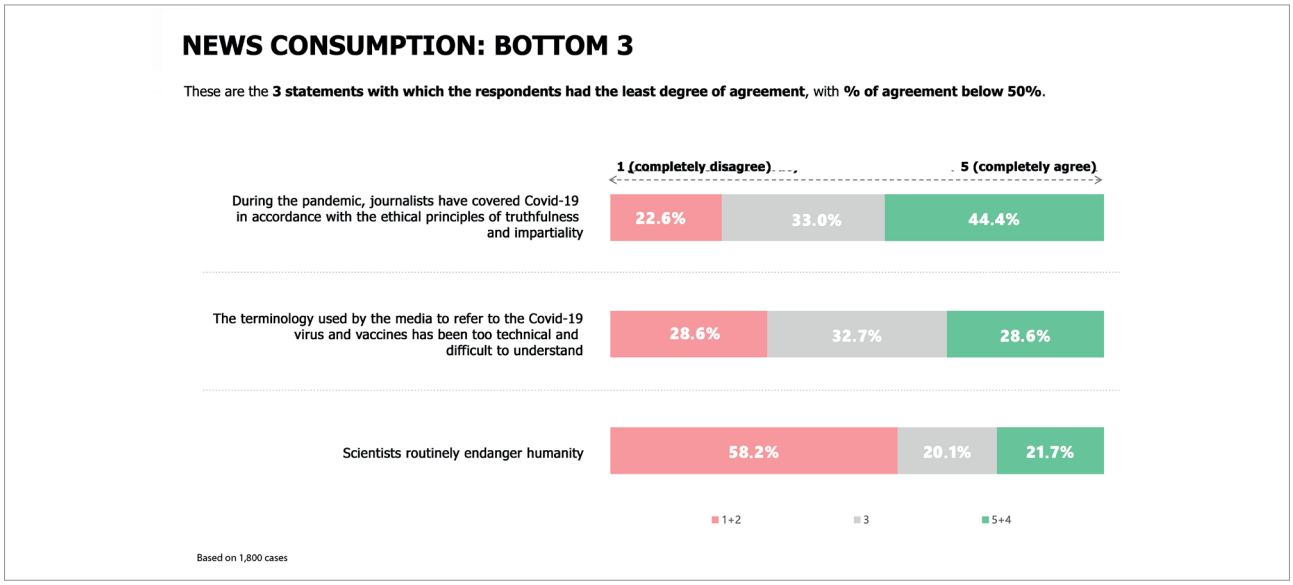
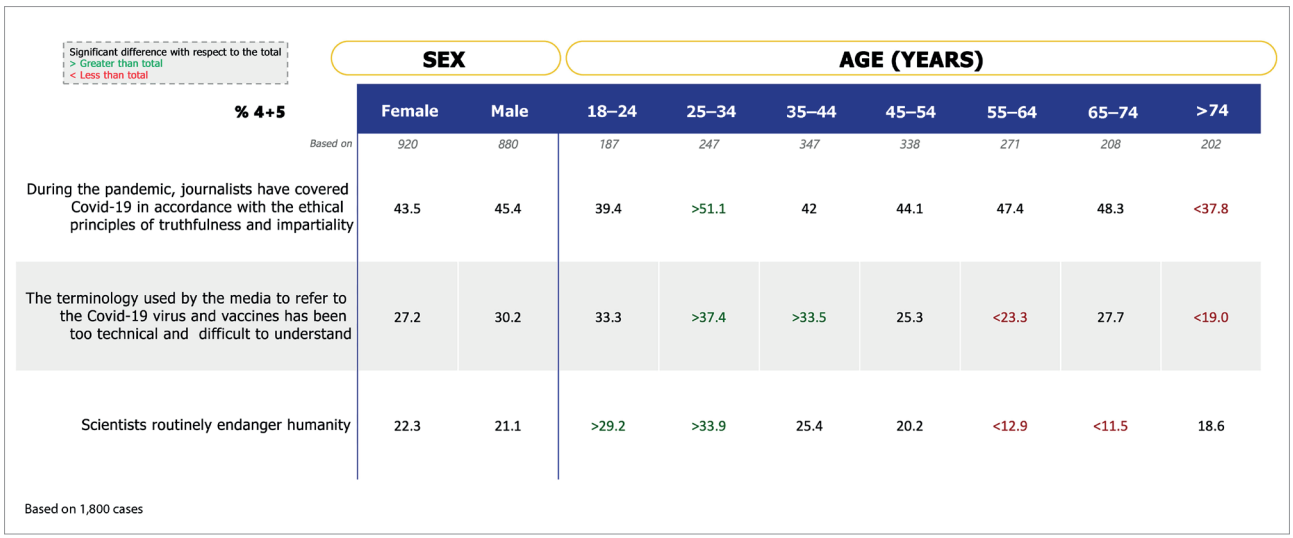


Figure 14. Degree of agreement/disagreement with BOTTOM 3 statements



Significant difference with respect to the total
> Greater than total
< Less than total

% 4+5	SEX		AGE (YEARS)						
	Female	Male	18–24	25–34	35–44	45–54	55–64	65–74	>74
Based on	920	880	187	247	347	338	271	208	202
During the pandemic, journalists have covered Covid-19 in accordance with the ethical principles of truthfulness and impartiality	43.5	45.4	39.4	>51.1	42	44.1	47.4	48.3	<37.8
The terminology used by the media to refer to the Covid-19 virus and vaccines has been too technical and difficult to understand	27.2	30.2	33.3	>37.4	>33.5	25.3	<23.3	27.7	<19.0
Scientists routinely endanger humanity	22.3	21.1	>29.2	>33.9	25.4	20.2	<12.9	<11.5	18.6

Based on 1,800 cases

Figure 15. Degree of agreement/disagreement according to gender and age with BOTTOM 3 statements

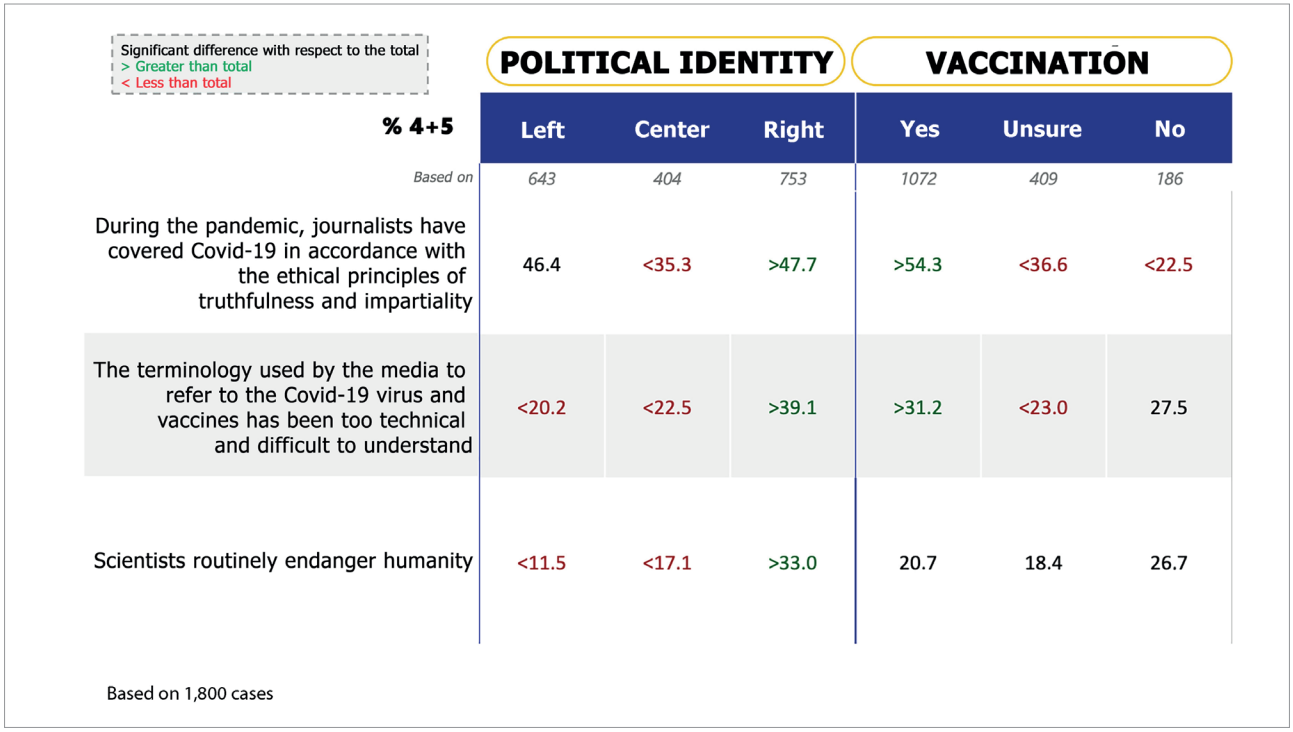
The lowest degree of agreement (BOTTOM) from the entire sample was with the following statements:

- S9: "During the pandemic, journalists have covered COVID-19 in accordance with the ethical principles of truthfulness and impartiality" (44.4%).
- S10: "The terminology used by the media to refer to the COVID-19 virus and vaccines has been too technical and difficult to understand" (28.6%).
- S11: "Scientists routinely endanger humanity" (21.7%).

According to gender, there were no notable differences, with respect to the total, in S9, S10, and S11.

According to age, the degree of agreement for S9 was higher, with respect to the total, in the age group 25-34 years (>51.1%) and lower in the age group over 74 years (<37.8%); for S10 it was also higher in the age group 25-34 years (>37.4%) and lower in the age group over 74 years (<19.0%); and for S11 it was higher again for the age group 25-34 years (>33.9%) and age group 18-24 years (>29.2%), and lower in the age group 65-74 years (<11.5%) and age group 55-64 years (<12.9%).

Political leaning made clear differences. Here the degree of agreement with the three statements was higher among people who defined themselves as right-wing (S9: >47.7%; S10: >39.1%; S11: >33.0%).

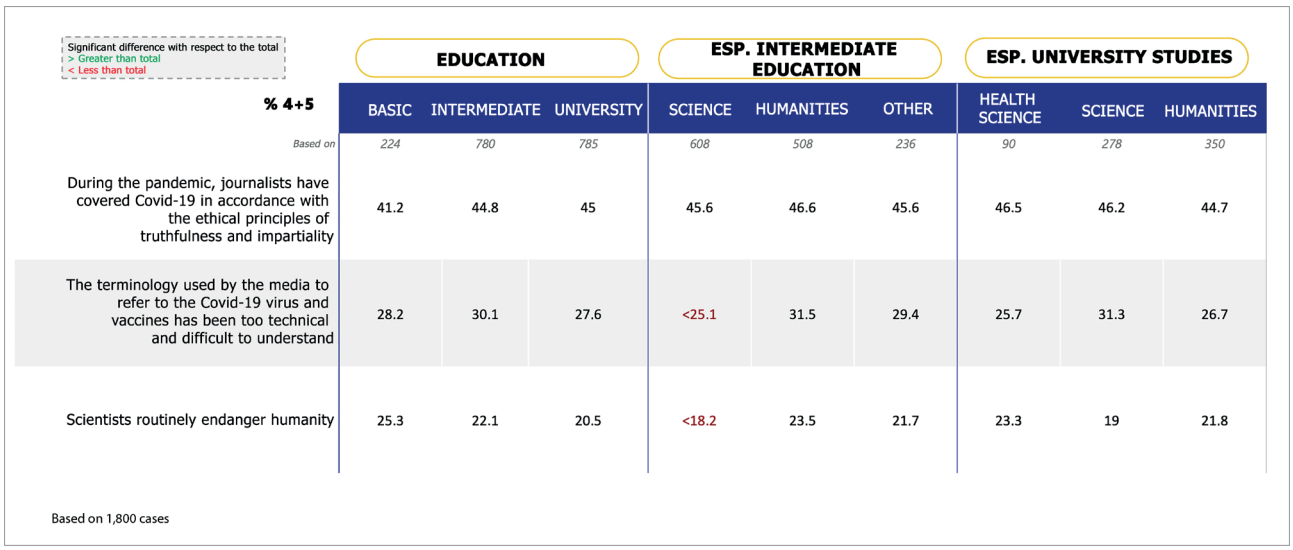


Significant difference with respect to the total
> Greater than total
< Less than total

% 4+5	POLITICAL IDENTITY			VACCINATION		
	Left	Center	Right	Yes	Unsure	No
Based on	643	404	753	1072	409	186
During the pandemic, journalists have covered Covid-19 in accordance with the ethical principles of truthfulness and impartiality	46.4	<35.3	>47.7	>54.3	<36.6	<22.5
The terminology used by the media to refer to the Covid-19 virus and vaccines has been too technical and difficult to understand	<20.2	<22.5	>39.1	>31.2	<23.0	27.5
Scientists routinely endanger humanity	<11.5	<17.1	>33.0	20.7	18.4	26.7

Based on 1,800 cases

Figure 16. Degree of agreement/disagreement according to political identity and attitude toward vaccines with BOTTOM 3 statements



Significant difference with respect to the total
> Greater than total
< Less than total

% 4+5	EDUCATION			ESP. INTERMEDIATE EDUCATION			ESP. UNIVERSITY STUDIES		
	BASIC	INTERMEDIATE	UNIVERSITY	SCIENCE	HUMANITIES	OTHER	HEALTH SCIENCE	SCIENCE	HUMANITIES
Based on	*224*	*780*	*785*	*608*	*508*	*236*	*90*	*278*	*350*
During the pandemic, journalists have covered Covid-19 in accordance with the ethical principles of truthfulness and impartiality	41.2	44.8	45	45.6	46.6	45.6	46.5	46.2	44.7
The terminology used by the media to refer to the Covid-19 virus and vaccines has been too technical and difficult to understand	28.2	30.1	27.6	<25.1	31.5	29.4	25.7	31.3	26.7
Scientists routinely endanger humanity	25.3	22.1	20.5	<18.2	23.5	21.7	23.3	19	21.8

Based on 1,800 cases

Figure 17. Degree of agreement/disagreement according to educational level and study discipline for BOTTOM 3 statements

With respect to attitude toward vaccination, there were notable differences in the degree of agreement with S9 –higher among pro-vaccinationists (>54.3%) and lower among anti-vaccinationists (anti-vaxxers; <22.5%) and those on the fence (<36.6%)– and with S10, also higher among those who accepted vaccination (>31.2%) and lower in those who were not certain about receiving it (<23.0%), whereas with S11 there was greater agreement among those who rejected vaccines (26.7%).

According to educational specialty, only the segment with intermediate studies in science had a different degree of agreement with respect to the total: lower for S10 (<25.1%) and S11 (<18.2%).

4. Discussion

This research is based on a survey of a sample of 1,800 adults residing in the 17 autonomous communities of Spain, designed to describe how information about COVID-19 has been consumed and what the public opinions on the role of journalists, the media, the scientific community, and health and governmental authorities are, and to understand consumption and opinions according to sociodemographic variables.

The results indicate that a high percentage of the sample population (85.1%) has closely followed the news related to the SARS-CoV-2 coronavirus pandemic, but the information consumption by young people (18-24 years old) in this context is much lower (13.8 percentage points below the sample mean and with a percentage difference of 16.21%).

The main sources of information were the traditional media (press, radio, and TV) and health authorities, which far surpassed other sources; in fact, both accounted for more than half of the respondents' first choices of sources. The second-choice sources of information were government authorities, research agencies, and, to a lesser extent, social network landscape. Among the other categories of sources, the limited role played by alternative sources, through which the scientific health and governmental authorities' versions of information about COVID-19 have been cast into doubt, stood out, albeit the differences between the 18-24 and 25-44-year-old segments were important. Those aged 18-24 years had lower values in comparison with the sample mean, and those aged 25-44 years had higher values, with a difference between the two groups of 5.7 points and a percentage difference of 68.75% and 50%, respectively, compared with the mean. In addition, the percentage difference between the two groups is 380% for the use of alternative sources. Also of note was the low percentage of first choices that were pharmaceutical and universities sources in general; in fact, they were practically negligible as sources of information.

According to the survey, the use of sources did not differ between women and men. We found coincident consumption behavior, which showed that gender is not a determining and differential variable, except in the case of social network use, where women went to their friends and family more to get information about the pandemic (+4.5 points, with a difference of 39.47% with respect to men).

Consumption of information about COVID-19 on social networks may pose a health risk. **Gallotti** *et al.* (2020) analyzed 100 million messages posted on *Twitter* between January 22 and March 10, 2020; their findings demonstrated that surges in potentially unreliable information preceded the increase in infections, showing that

> "in a highly digital society, the epidemic and the infodemic dimensions of COVID-19 co-evolve" (**Gallotti** *et al.*, 2020, p. 1289).

> Political identity conditioned information-seeking behaviors. Respondents who identified as centrists trusted the traditional media more than those on the left and the right

> The main sources of information during the pandemic were the traditional media and health authorities. Respondents' second-choice sources included government authorities, research organizations, and the social network environment

The risk of exposure to disinformation on social networks –where fake news is ubiquitous– is higher, as **Naeem**, **Bhatti** and **Khan** (2020) observed after analyzing 1,225 pieces of fake news about COVID-19, replete with false claims about, conspiracy theories regarding, and pseudoscientific therapies involving the diagnosis, treatment, prevention, origin, and spread of this disease. In a citizen survey conducted between March 17 and 24, 2020, among people aged 18-65 years living in Spain during the lockdown period (two years prior to the survey used for this research), **Bernal-Triviño** (2020, p. 175) found that most of the fake news identified by respondents came from *WhatsApp* (90.5%) and social networks (87.9%), followed distantly by television (18.2%).

In Spain, in the first months of the pandemic, "social networks, including both private messaging applications and open networks, provided the primary setting for the spread of hoaxes (82.9%), way ahead of the traditional media and other interpersonal communication channels" (**León** *et al.*, 2022, p. 11). If the use of social platforms exposes citizens to more false information, the survey conducted for this work shows that a significant part of the sample was not at a high risk of exposure owing to these networks' use as second-choice options for information-seeking, although there were segments of the population that were more vulnerable, mainly women and young people. In an online survey conducted in July 2021 with a sample of 682 subjects, also residents in Spain and of legal age, that was similar to the survey conducted for this research, **Casero-Ripollés**, **Doménech-Fabregat** and **Alonso-Muñoz** (2023, p. 9) found that

> "women perceive the impact of disinformation with less intensity",

although according to the data from the survey conducted for this study, they turn more often to social networks.

Bernal-Triviño (2020) found that the majority of respondents preferred to obtain information from the online press (50.4%), whereas 33.3% opted for social networks and 31% for television. In addition, 35% preferred to seek information from targeted and official sources, such as the *Official State Gazette* (*BOE*), the *World Health Organization* (*WHO*), and scientific articles on COVID-19. Radio and the press were considered the "most credible and reliable" media (**Bernal-Triviño**, 2020, p. 175). These results were similar in some aspects to those obtained in the survey conducted for this research, where conventional media and health authorities were the respondents' preferred options, but they differ in the use of social networks as sources of information, which is lower in the study conducted for this research than in that of **Bernal-Triviño** (2020).

The results of the survey conducted for this research did not depart much from those obtained by **König** and **Breves** (2021) in a social network experiment on public perception of political and scientific authorities during the COVID-19 crisis, with a sample of 424 participants. Their results only partially support the hypothesis that the public considers the recommendations of scientists to be more reliable. Furthermore, according to data from **König** and **Breves** (2021), scientists possess more expertise than politicians, but politicians convey more integrity and benevolence than scientists. This could explain why, in the survey conducted for this study, the health authorities (Ministry/councils) and governments ranked higher than research organizations and universities as first-choice sources of information. However, according to **Casero-Ripollés**, **Doménech-Fabregat** and **Alonso-Muñoz** (2023), a primary effect of disinformation is increased distrust toward traditional media and politicians, which contrasts with the results obtained from the survey from this research. Another study focused on the sources used by the Spanish press to provide information to address doubts that surfaced in response to vaccine use says that the press's main source was governmental institutions (**Catalán-Matamoros**; **Elías**, 2020).

The data obtained in the survey from this study showed that age was a determining and differential variable in the use of some sources. Younger profiles (aged 18-34 years) used their social network contacts for monitoring COVID-19 more than other groups did, whereas older profiles (+65 years) preferred to obtain information from authorities (ministries/councils, governments, research bodies, and pharmacies). The percentage difference with respect to the average in the use of social networks was 95.65% higher in the youngest group and 71.74% lower in the oldest (+74 years), with a percentage difference between the youngest and oldest groups of 592.31%. These results can be related to those of **Casero-Ripollés**, **Doménech-Fabregat** and **Alonso-Muñoz** (2023), where they observed that the higher the age, the lower the perception of the intensity of disinformation's effect, which is related to the type of sources used. However, there is a discrepancy, since in their study they state that, in those over 65 years of age,

> "of note is their trust, both toward traditional media and toward social networks and information sources" (**Casero-Ripollés**; **Doménech-Fabregat**; **Alonso-Muñoz**, 2023, p. 10),

whereas in the research carried out for this work, the use of social networks was higher among younger people and lowered as age increased.

Political identity conditioned information-seeking behaviors. Respondents who defined themselves as centrists trusted the traditional media more than those on the left and right. Left-wingers preferred health authorities (ministries/councils) as sources, and those on the right preferred research organizations, pharmacies, and universities. The survey

results showed that right-wingers were the least likely to rely on traditional media, government authorities, and governments as sources of information. And left-wingers turned less frequently to research organizations and the pharmaceutical sector; thus, it follows that they are more distrustful of these sources but also of the environment on social networks.

> "The use of sources did not differ between women and men, except in the use of social networks, where women turned more to their friends and family for information about the pandemic"

Casero-Ripollés, **Doménech-Fabregat** and **Alonso-Muñoz** (2023) also analyzed behaviors taking ideology as a reference and found that people on the extreme right

> "perceive a higher incidence of disinformation, both in terms of changing an opinion and voting decision and of their distrust of traditional media and social networks as sources of information",

whereas citizens who consider themselves on the extreme left and on the left

> "perceive there to be fewer ramifications from disinformation and exhibit a more favorable view of traditional and digital media as reliable sources of information".

On the other hand,

> "those in the center and on the extreme right are the most critical in this aspect and show a greater degree of distrust toward the media" (**Casero-Ripollés**; **Doménech-Fabregat**; **Alonso-Muñoz**, 2023, pp. 11-12).

Attitude toward vaccines, according to the survey results, was not a variable that made substantial differences in use of sources, in general. The results showed that anti-vaccinationists consumed less information from traditional media and more from alternative sources that disseminate discourse, for example, denialist and conspiracy discourse, that runs contrary to what the scientific health and governmental authorities say. **Casero-Ripollés**, **Doménech-Fabregat** and **Alonso-Muñoz** (2023, p. 1) show that, in Spain, untruths

> "have had an impact on the rise of conspiracy theories among citizens".

Other research by **Elías** and **Catalán-Matamoros** (2020) found that, during the coronavirus pandemic, there was an increase in the consumption of alternative television programs that began to address health issues in the manner as mystery and esotericism. And data from **León** *et al*. (2022, p. 11) indicated that

> "hoaxes with scientific and health-related content accounted for a considerable percentage (35.08%) of all false information spread during the first three months of the pandemic".

In a survey of 2,501 adults in England between May 4 and May 11, 2020, **Freeman** *et al*. (2022) found that people who believe in conspiracies are less likely to follow social distancing guidelines, wear a facemask, take a test, or accept the COVID-19 vaccine. And in another series of national surveys conducted between mid-April and early May 2020 in Ireland (n = 700), the United States (n = 700), Spain (n = 700), and Mexico (n = 700), and two separate ones in the United Kingdom (n = 1,050 and n = 1,150), **Roozenbeek** *et al.* (2020) found that there is a clear link between accepting erroneous or false information and having doubts about vaccines and a lower probability of complying with health measures imposed or recommended by the authorities.

When analyzing the level of trust/distrust in science, the data showed that there was a social consensus on its role as a bastion of truth and the importance of its public function (82.0%), but a lower degree of trust in science was observed in the youngest subgroup (18-24 years) and higher degree in the older segments. The percentage difference between the youngest group and the average was 15.3% lower, and the percentage difference between this segment and the age group 65-74 years (the one with the highest degree of confidence) was 24.3%. Left-wingers were also more confident in science, and centrists less so; in fact, the former trusted science 15.02% more than the latter.

Differences in the perception of science were substantial depending on attitude toward vaccines. It was higher in the pro-vaccine group and lower in the anti-vaccine group, with a difference of 22.6 points between the two subgroups and a percentage difference of 34.77%. This also depended on the level of education. Thus, those with a university education expressed a higher level of confidence in science, especially those who had pursued a science degree. **Hamilton** (2015) found that, in the United States, trust in scientists when it came to vaccines, in general, was also higher the higher the respondent's educational level, but it was lower among people who were ideologically conservative.

The overall positive view of science in the research carried out for this study was rounded out by the fact that only 2 out of 10 respondents believed that scientists habitually endanger humanity, although the percentage of agreement with this statement was higher among those who defined themselves as ideologically right-wing and among the two younger subgroups. This statement corresponds to conspiratorial thinking, being that

> "people motivated to reject an overwhelming scientific consensus, one way in which they may explain this consensus is via the ideation of a conspiracy among researchers" (**Lewandowsky**; **Oberauer**, 2016, p. 219).

In addition, conspiratorial thinking has been shown to be linked to the denial of vaccines' benefits (**Briones** *et al*. 2012).

> Consumption of information about COVID-19 on social networks may pose a health risk

One of the questions that researchers have asked most often is whether level of education, scientific knowledge, and scientific literacy can predict public attitudes toward science and trust in science. **Allum** *et al.* (2008) found a positive correlation between general attitudes toward science and general knowledge of scientific facts in 40 countries.

Using their *Science credibility scale*, **Hartman** *et al.* (2017, p. 365) demonstrated that

> "people with higher levels of education reported more positive evaluations of science, although this effect accounted for only 3% of the variance in *CoSS* [*Credibility of science scale*] scores,"

and additionally a positive association between evaluations of science and scientific literacy was found. Thus, as in the results of the survey conducted for this research, not only does confidence increase with higher level of education, but also it is increased among those who belong to the science field. However, while **Hartman** *et al.* (2017, p. 365) note that age and gender each accounted for less than 1% of the variation in their scores, in the survey conducted for this research, there were in fact significant differences between the youngest and oldest, with those aged 18-34 years having a less positive view of science. The results of the survey also agreed with **Hartman** *et al.* (2017) and **Gauchat** (2012) as to the influence of political ideology, as it was shown that more conservatives viewed science less positively than progressives or liberals.

Public confidence in science contrasted with the views and experiences of some scientists. A survey conducted by *Nature* of 321 scientists from various countries who reported and commented on the COVID-19 pandemic in the media and on social networks shows that 81% of respondents suffered personal attacks or attacks from trolls, 59% received attacks on their credibility on social networks, 22% received threats of physical or sexual violence, 15% received death threats, and 6 of the respondents suffered physical attacks (**Nogrady**, 2021). A *Science* survey of 510 scientists who have published papers on COVID-19 says that 38.2% suffered some form of harassment or abuse, ranging from insults to death threats via social networks, email, or telephone, and sometimes even in person (**O'Grady**, 2022).

The high degree of confidence in science expressed by respondents contrasted with their distrust of journalism and the media during the public health crisis –a distrust that was indicated by three-quarters of the sample agreeing that the existence of news or information about the COVID-19 pandemic that distorted reality was a problem for the country and indicating that there should be external control over journalism to oversee the quality of the content disseminated by the media when it comes to health issues. The latter statement was more marked in the 25-34-year-old segment and less so in the 74+-year-old segment. In addition, respondents who defined themselves as ideologically left-wing were more aware of the negative impacts of disinformation, whereas anti-vaxxer respondents were less concerned about it and also demanded external monitoring of health information less. The results of the survey conducted for this research differed from those of **Casero-Ripollés**, **Doménech-Fabregat** and **Alonso-Muñoz** (2023, p. 7), which state that the data

> "reveal that Spanish citizens perceive the effects of disinformation at a medium-low intensity".

The survey by **Casero-Ripollés**, **Doménech-Fabregat** and **Alonso-Muñoz** (2023) also maintains that the mechanisms for combating disinformation that citizens view to be the most effective are, firstly, the work carried out by agencies that fact-check fake news and, secondly, criminal legislation to punish the dissemination of this type of content. Other mechanisms identified as factors that helped were media literacy and the promotion of governmental plans, and respondents considered consuming news from traditional media to be the least useful resource (**Casero-Ripollés**; **Doménech-Fabregat**; **Alonso-Muñoz**, 2023, p. 12).

Citizens' opinions on these issues, both in the survey from this research and in that of **Casero-Ripollés**, **Doménech-Fabregat** and **Alonso-Muñoz** (2023), can be tied to the low level of agreement on the statement that said during the pandemic journalists followed the ethical principles of truthfulness and impartiality when covering COVID-19, a statement with which only 4 out of 10 of those surveyed for this research agreed. Those over 74 years of age, centrists, anti-vaxxers, and vaccine skeptics had the least confidence in journalism, and those aged 25-34 years and people who were pro-vaccine had the most confidence in the veracity and impartiality of journalistic information. These results coincided in many respects with those of **Bernal-Triviño** (2020), for example, when she states that respondents

> "expressed feelings of exhaustion or impatience with the lack of new developments and repetitive content, confrontations based on controversies and media exclusives, sensationalism and 'macabre' use of more personal stories about patients and their families, doubts regarding data and their different interpretations depending on the media outlet, and the creation of 'alarm or hysteria'" (**Bernal-Triviño**, 2020, p. 176)

In **Bernal-Triviño**'s research (2020, p. 176), respondents also pointed out the "lack of ethics in some television programmes" and doubted the expertise of the studio guests to talk about COVID-19. Specifically,

> "a total of 41.5% stated that the media did not use quality sources or invite sufficiently well-informed studio guests […] The result was the media were becoming 'news sellers,' where authority and knowledge were no longer basic requirements as long as audience ratings were high" (**Bernal-Triviño**, 2020, p. 178).

And

> "the way in which they have done so is clearly sensationalist because in many cases it has followed in the footsteps of the worst crime journalism programs" (**Francés-Lecumberri**, 2020, p. 105).

In addition, **Costa-Sánchez** and **López-García** (2020) found examples of fearmongering and sensationalism in news reporting during the first months of the pandemic.

However, the distrust of journalists and the media reflected in the results of the survey conducted for this research contrasted with the low levels of perceived difficulty in understanding the terminology used by the media to refer to COVID-19 and vaccines. Thus, it can be deduced that, in general, the quality of the information offered, in terms of readability and comprehension, was interpreted as good, mainly by the older segments, pro-vaccinationists, and centrists and left-wingers. However, this differs from the findings of **Bernal-Triviño** (2020), where interviewees

> "expressed their concern over lack of scientific rigour in such a delicate public health situation and the sensationalism with regard to the number of deaths, while they rejected the language of war used to describe the crisis. They also expressed the feeling that the media prioritized speed over depth, leading to 'contradictions or misunderstandings that have to be corrected later on, but without acknowledging making such corrections'" (**Bernal-Triviño**, 2020, p. 176).

With respect to level of education, in general, there were no major differences in the degree of trust in journalistic work, according to the results of the survey conducted for this research. However, according to the survey by **Casero-Ripollés**, **Doménech-Fabregat** and **Alonso-Muñoz** (2023), the most educated people

> "are the most critical of the media, both traditional and digital, considering them to be unreliable as a source of information".

Their results also indicate that

> "the level of education has differing consequences on Spanish citizens' perception of misinformation" (**Casero-Ripollés**; **Doménech-Fabregat**; **Alonso-Muñoz**., 2023, p. 10).

The view of science and journalism was also recently studied in Austria so as to understand the possible impacts of the populist anti-elite and anti-science rhetoric of certain political actors. In this case, it was observed that populist attacks on science and journalism have limited effects on the perceptions of citizens, whose

> "attitudes towards scientific issues are rather stable and not easily influenced by anti-science communication on social media" (**Egelhofer**, 2023, p. 370).

Could this happen in Spain? Although the level of trust in science shown by the respondents in this research was high and stable, it was not shown to be sufficient to face the emerging populist discourse of some Spanish parties and politicians; it also must be ascertained whether they contribute to the erosion of journalistic credibility. This is a line of research that should be explored.

5. Conclusions

Ideology conditions the use of different types of information sources. Centrists consume more traditional media than those on the political left or right, who are the least likely to turn to them for information. And left-wingers rely more on official sources, such as health authorities, in contrast to centrists or right-wingers.

The percentage of respondents who consider universities –which do not have political ties in Spain– to be reliable sources when it comes to scientific topics such as COVID-19 was very low (1.9%). However, the percentage of respondents who obtained information from political sources (ministries or councils) reached 26.4%, and those who preferred scientific sources that had political ties, because their heads are appointed by the government, as with the *CSIC* or the *Carlos III Health Institute*, accounted for 11.4%.

Antivaxxers obtained information less from traditional media and preferred alternative sources (programs such as *Cuarto Milenio* or *La Estirpe de los Libres*, for example). This is explained by the fact that traditional media supported vaccines (**Catalán-Matamoros**; **Elías**, 2020).

The consensus that science aims to seek the truth and make it public (82.0%) showed that there was great confidence in science, but the youngest –in theory the most well-educated– agreed the least with this statement: Only 72.6% of respondents aged 18-24 years agreed, compared with 90.2% of those aged 65-74 years. These data suggest that distrust in science is increasing among young people, which explains, for example, the shortage of people in this segment pursuing scientific careers (**Elías**, 2019).

In contrast to the confidence in science that respondents had nearly across the board, they expressed a great distrust about the media. The statement "the existence of news or information about the COVID-19 pandemic that distorts reality is a major problem in our country" was supported by 76.8%, and 72.6% considered it advisable to have external oversight over journalism to monitor the

> Differences in the perception of science were substantial depending on attitude toward vaccines

quality of media content when it comes to health matters. This statement was supported by another idea that very few agreed with: Only 44% believed that, during the pandemic, journalists covered COVID-19 in accordance with the ethical principles of truthfulness and impartiality. These data showed that there was trust in science and distrust in journalism.

The distrust of journalists and the media in a global public health crisis such as COVID-19 demonstrates that the defense of truth and access to verified, reliable, and accurate information have become a "matter of life and death" (**Posetti**; **Bontcheva**, 2020a; **Pennycook** *et al.*, 2020). And the role that journalism must play is fundamental.

For citizens, even those who have scientific backgrounds, it can be complicated to identify what is science; science is about following the scientific method; it is not about using scientific jargon, and it is not simply what a scientist or a health authority with political ties says (**Elías**, 2020). This nuance is important, as many health hoaxes use scientific jargon so that they sound like science, but obviously they are not. This cocktail that was observed in the results of the survey conducted for this research is very conducive to fake news and hoaxes –alternative sources that disseminate false information, but garnished with scientific jargon, and, at the same time, having great distrust in traditional journalistic media and watching alternative programs such as those of esoterists and conspiracy theorists.

The study population recognized that information from health authorities appointed by political appointment or from research organizations, which also had political ties (*CSIC* and *Carlos III Health Institute*), was science, but hardly any of them did when it came to universities, which are independent. This shows that the communication offices of institutions with political ties are mobilized when there is an information crisis involving science. In contrast, those of universities stand alone and do not participate in the public debate.

This research analyzed the consumption of information and the shaping of public opinion regarding COVID-19 and the role of science and journalism in this public health crisis, using one of the largest surveys ever conducted in Spain using this approach.

The limitations of this research were determined by the application of descriptive statistics, which were adequate to characterize the sample and the subgroups that compose it, but make it difficult to establish correlations between the variables analyzed that could be obtained with inferential statistics. Moreover, being a national survey, the results cannot be extrapolated to the international level, but the characteristics of the survey and the size of the sample allow us to provide a useful and valid outline for other research that seeks to expand lines of study on how information about COVID-19 has been consumed and the shaping of public opinion on the role of science and journalism in this health crisis in Spain.

We believe that these results can serve as a basis for further research to figure out and explain variables that may have influenced the behaviors of the Spanish public in response to the pandemic. They can also enable comparative studies to be carried out in other geographical areas. In addition, they can be useful for governmental, administrative, and scientific health authorities in making strategic communication decisions, and for journalists and the media to better understand the behaviors of their target audiences and improve their information strategies regarding health and well-being.

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Motivations on *TikTok* addiction: The moderating role of algorithm awareness on young people

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Abstract

Algorithm awareness, which is defined as the degree to which the user is aware of the presence of algorithms and the way in which they function, could influence how users behave online and interact. The main focus of this study is to understand how algorithm awareness moderates the association between usage motivations and addiction to *TikTok* videoclips among young people. An online questionnaire was designed and responses attained from 473 young people in China to explore the motivations for consuming video clips, their algorithm awareness levels, and the degree of addiction when using *TikTok*. The survey results confirm that there are six main factors that motivate young people to consume video clips on *TikTok*, of which the relaxing entertainment motivation and the information-seeking motivation receive higher scores. They also reveal that the level of addiction to *TikTok* is relatively high, whereas the level of algorithm awareness among young people remains at a relatively moderate level. Second, when investigating the motivations for use that lead to addiction, the motivations of information seeking, relaxing entertainment, and social interaction are found to be predictors of *TikTok* video clip addiction. Third, the moderating role of algorithm awareness, whose effects on interactions with information seeking and relaxing entertainment are significant, is studied, and it is found that increasing the level of algorithm awareness among young people could help reduce the addictive use of *TikTok*.

Keywords

Motivation; Moderation; Young people; *TikTok*; Social media; Social networks; Algorithm awareness; Algorithms; Video clip; Filter bubbles; Addiction; Social interaction; Information; Entertainment.

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1. Introduction and theoretical framework

Currently, *TikTok*, which is based on the streaming of video clips, has become a mobile application that has expanded rapidly throughout the world. Since the beginning of Covid-19 and the lockdown, the average amount of time per day that young people spend consuming video clips has been continuously increasing, causing the social network *TikTok* to become more and more popular and triggering a boom in the creation and dissemination of audiovisual content for it. Moreover, *TikTok* uses artificial intelligence to show the user content that may interest them, creating addiction through

the process of using this software that uses an automatic algorithm, the result of which is reflected in the filter bubble around young people. Therefore, examining the awareness of algorithms on the platform and understanding how it influences the relationship between the motivations behind *TikTok* use and *TikTok* addiction among young people are the main concerns of this study.

1.1. Video clip platforms and motivations for using *TikTok*

Studies on short video consumption and the usage habits of young people have received renewed attention in recent years. Platforms such as *YouTube* allow users to search for and view videos, as well as interact in certain ways, such as following users, liking/disliking videos, and posting comments; they can also create user channels, on which videos made by the users themselves are stored and disseminated (**Orduña-Malea**; **Font-Julián**; **Ontalba-Ruipérez**, 2020). *TikTok* allows users to watch, share, comment on, and create short videos, satisfying the different needs of recreation, socialization, and information seeking (**Omar**; **Dequan**, 2020).

The uses and gratifications theory (U&G), which is used to analyze how and why people use media, is based on five main assumptions (**Katz**; **Blumler**; **Gurevitch**, 1973):

1) that media use is governed by goals, motivations, and intentions;

2) that audiences take the initiative in selecting and using the media to satisfy a set of psychosocial needs;

3) that media outlets compete with other forms of communication to satisfy needs;

4) that members of the audience are aware of their motivations for using media; and

5) that audience members play a prominent role in evaluating the value of media content and the gratification gained from media use.

Research using the U&G theory has revealed that the needs and desires that motivate consumption and engagement on media outlets also vary depending on the platform being used (**Kircaburun** *et al*., 2020).

Four main uses of *TikTok* have been identified: information, dissemination of interesting video clips, promotion, and participation in challenges (**Fiallos**; **Fiallos**; **Figueroa**, 2021). Therefore, young people consider *TikTok*'s video clip software to be not only a space for pure entertainment but also a means of spreading information and knowledge. Particularly during the pandemic, the three main reasons why *TikTok* users spent their time using this social network were related to activities they do in their free time, namely find funny or entertaining video clips, fill free time, and find new ideas or inspiration (**Oana-Frățilă**, 2021). Furthermore, in this period, *TikTok* videos could have a therapeutic impact on consumers, relieving boredom and positively impacting their mental health (**Udenze**; **Uzochukwu**, 2021). The most common category is news, used for communicating facts and relevant data to citizens and generally linked to current affairs, including politics, science and the environment, society, mass events, education, and news related to *TikTok* (**Vázquez-Herrero**; **Negreira-Rey**; **López-García**, 2020). However, the media's presence and impact on the social network *TikTok* is low, and most of the content is created by active *TikTok* users and is based on viral and entertainment content and topical information (**Peña-Fernández**; **Larrondo-Ureta**; **Morales-i-Gras**, 2022).

Users also value how social networks such as *TikTok* and *YouTube* provide them with the opportunity to post and share self-produced content with friends and family and receive likes as a form of self-expression (**Scherr**; **Wang**, 2021; **Khan**, 2017). Thus, it can be stated that as a social networking platform, showing others who you are is an equally important motivation for using *TikTok*. The motivation of there being new trends in *TikTok* usage reflects how the app itself is cool, new, and exciting to use, and also how many other users use the app for this reason (**Scherr**; **Wang**, 2021).

1.2. Addiction, the recommendation algorithm, and filter bubbles

Social media addiction is a behavioral addiction characterized by an uncontrollable and insatiable desire to be constantly online, neglecting other areas of one's personal life (**Brailovskaia**; **Schillack**; **Margraf**, 2020). Social media addiction is more difficult to deal with than substance addiction because social media platforms use algorithms to increase users' time on the platform, tapping into the desire for social recognition and providing intermittent reinforcement to stimulate excessive use as a compulsive behavior (**Liao**; **Sher**; **Liu**, 2023). Research on online short video apps shows that the development of an addiction is partly due to the app's algorithm, which allows users to get personalized content without having to search for it (**Zhang**; **Wu**; **Liu**, 2019). In *TikTok*'s case, the risk factors for problematic and addictive use have also included younger age, low income, and low level of education (**Huang**; **Hu**; **Chen**, 2022; **Lewin**; **Ellithorpe**; **Meshi**, 2022).

Young people still lack necessary knowledge about digital and computer technologies and their proper use. The lack of knowledge related to the recommendation algorithm and media literacy have led to young people obtaining potentially dangerous and limited types of information when they consume short videos (**Quelhas-Brito**, 2012). Although software algorithms could help by recommending more content that they need to young people in the context of Big Data and the information explosion –information with which artificial intelligence automates its search function, classification, and information processing and is already a fixture in its editorial duties (**Túñez-López**; **Toural-Bran**; **Cacheiro-Requeijo**, 2018)– it is inevitable that for these reasons young people end up addicted and trapped within their own filter bubble, in the searches and recommendations that are excessively personalized to what they consume when using the platform.

The filter bubble is a concept defined by cyber-activist **Pariser** (2011) to illustrate how people live in a universe of personalized information that matches their own preferences and tastes and are trapped in this state of intellectual isolation with results from related searches and homogeneous results. In filter bubbles, people are encapsulated in data streams, with news or updates from social networks that are personalized according to the interests of the users owing to algorithm-based searches (**Pariser**, 2011).

Many researchers in the journalism and communication fields are more inclined to worry about and criticize the negative aspects of the recommendation algorithms with which users interact as they are stuck in their filter bubble (**Rodríguez-Cano**, 2018). Personalized content and services limit the diversity of media content that people are exposed to and will have an adverse effect on democratic discourse, open-mindedness, and a healthy public sphere (**Nguyen** *et al.*, 2014). In this sense, the filter bubble is a problematic consequence of modern media and social networks since it creates barriers to the rational and diversified dialogue that is necessary for a democratic society (**Amrollahi**, 2021).

1.3. Algorithm awareness to curb addiction

Algorithm awareness is defined as the degree to which users are aware of the presence and operation of algorithms in a specific consumer context and in relation to concepts such as fairness, transparency, and trust (**Swart**, 2021). Algorithmic media content awareness (AMCA) is defined as the extent to which people have accurate perceptions of what algorithms are doing in a particular media environment, as well as their impact on the way users consume and experience the media content (**Zarouali**; **Boerman**; **De-Vreese**, 2021). The user's level of algorithm awareness influences how the user would behave online and interact and engage with algorithms (**Schwartz**; **Mahnke**, 2021).

However, most users do not fully understand that platforms use such automatic algorithms to offer recommendations to them (**Gran**; **Booth**; **Bucher**, 2021). In particular, many young people, when dealing with school stress, become even more addicted to the use of automated social networks (**Fernandes** *et al.*, 2020). Thus, when they consume the short videos offered on the *TikTok* platform to get news and have fun, they easily get addicted, they become deeply immersed in their favorite material, and they cannot free themselves from it because they do not understand the mechanism of the recommendation and filtering system (**Gómez**; **Charisi**; **Chaudron**, 2021).

Since algorithms operate using a process similar to a black box, it is important to examine how users become aware of these issues, how they can meaningfully control their own interactions with AI by managing the data they choose to share and evaluating their privacy and security practices, and what impact transparency has on user behaviors, particularly in their response to privacy concerns (**Shin**; **Park**, 2019). Four factors for defining algorithm awareness were found, namely content filtering, automated decision-making, human-algorithm interaction, and ethical considerations for the AMCA scale, which from a theoretical perspective could function as a moderator at the individual level and serve as an important variable in influencing the magnitude of algorithmic media's effects or altering algorithmic perceptions and attitudes (**Zarouali**; **Boerman**; **De-Vreese**, 2021). Ethical considerations address three important ethical concerns in relation to algorithm-mediated content: privacy intrusion, lack of transparency, and algorithmic bias (**Koene** *et al.*, 2015; **Susser**; **Roessler**; **Nissenbaum**, 2019; **Bigman** *et al.*, 2021).

Based on these arguments and previous research, we propose the following research objectives and hypotheses:

(1) Identify the main motivations for consuming *TikTok* videos. It is hypothesized that the motivations for the consumption of *TikTok* videos are for information, entertainment, social interaction, and self-expression, and because of a new trend.

(2) Analyze what consumption motivations lead to the addictiveness of *TikTok* videos. It is hypothesized that young people influenced by some motivations are likely to be addicted to *TikTok* videos.

(3) Assess the relationships between algorithm awareness and *TikTok* addiction. It is hypothesized that algorithm awareness moderates the association between motivations and addiction to *TikTok* in such a way that, among young people with higher level of algorithm awareness, addiction to *TikTok* will be lower.

2. Method

This article analyzes the motivations and the addiction of young people who consume *TikTok* videos; explores the correlations between consumption motivations, algorithm awareness, and *TikTok* addiction; and finally analyzes the moderating effect of algorithm awareness.

We recruited participants through *Credamo*,
https://www.credamo.com

Credamo is an online survey service provider in China and has similar features to *Amazon Mechanical Turk*. *Credamo* has an online research sample of 2.8 million participants. Its online research sample includes participants from different regions of China and of different ages, educational levels, and economic statuses. To calculate the sample, a proportional and stratified sampling strategy was followed, with stratification according to sex, age, and course and type of university. At the beginning, 503 responses were collected from *TikTok* users. After the filtering process was carried out and the incomplete responses were excluded, 473 valid responses were retained for data analysis. In light of the exposed theo-

retical framework, and considering that empirical studies on this matter are still scarce, we carried out a study based on the sample of 473 young people between the ages of 18 and 22 years, with an average age of 20.53 years (standard deviation [SD] = 1.31 years), who consumed short videos on the platform *TikTok* in China. The ages would correspond to the undergraduate stage in China. Of the sample,

- 25.4% were students in their 1st year of the degree,
- 25.2% were in the 2nd year of their degree,
- 24.8% were in the 3rd year of their degree and, finally,
- 24.5% were in the 4th year of their undergraduate degree.

The survey was carried out from April 27 to 29, 2023, using a structured questionnaire. According to sex, 47.3% were boys and 52.6% were girls. Of the total number of the students, 83.3% attended public universities and 16.7% were from private universities.

The data obtained from the survey were analyzed using *SPSS* software version 26, and the statistical significance of *p*-value < 0.05 was used. Starting from the basic descriptive statistics, other more complex inferential statistical analyzes were carried out. Overall, the procedure consisted of three parts. The first involved understanding the descriptive characteristics of the sample of *TikTok* users. The second was about finding and measuring the main motivations for the use of *TikTok*, the degree of awareness of the recommendation algorithm, and the level of addiction using the five-point Likert scale. Third, the correlations between the three variables mentioned above and the moderating effect of algorithm awareness on the relationships between motivations for use and addiction were investigated.

The measuring tool for the motivations used in the current study was based on previous research for the motivations for using *Facebook* (**Papacharissi**; **Mendelson**, 2010; **Andreas-Schwartz**; **Skrubbeltrang-Mahnke**, 2021) and *Instagram* (e.g., **Sheldon**; **Bryant**, 2016), and those adapted from *TikTok* (**Omar**; **Dequan**, 2020), and the items were rated on a 5-point Likert scale (where 1 = very unlikely and 5 = very likely). In all, six motivational factors related to U&G were included in this study: information seeking, information giving, relaxing entertainment, self-presentation, social interaction, and new trend. The scales were created using a set of items that had good reliability and Cronbach's alphas, since all the scales were above 0.7.

There is currently no specific validated scale to measure *TikTok* addiction severity. Therefore, this dimension was assessed using an adapted version of the Internet Addiction Test (IAT; **Young**, 1998), which is the most widely used and validated scale to evaluate Internet addiction. The IAT is composed of 20 items, and each item is rated on a 5-point Likert-type scale (1 = rarely; 5 = always). The items were modified to fit the context of *TikTok* usage (e.g., How often do you stay longer on *TikTok* than you intended?). In the present study, Cronbach's alpha was 0.90, which indicated a good internal consistency.

Awareness of the algorithm that selects and presents content on *TikTok* was assessed using an adapted version of the Algorithmic Media Content Awareness (AMCA) scale (**Zarouali**; **Boerman**; **De-Vreese**, 2021). The AMCA scale was successfully verified through three online platforms: *Netflix*, *YouTube*, and *Facebook*. The scale consists of 13 items that specifically measure the level of users' awareness of the use of algorithms (e.g., algorithms are used to prioritize certain media content over others, algorithms are used to show me media content on *TikTok* on the basis of automated decisions, and the media content that algorithms recommend to me on *TikTok* depend on my online behavior on that platform). Possible responses ranged from 1 (not at all aware) to 5 (completely aware). The higher an individual's score was, the higher the level of the algorithm awareness was.

Table 1. AFE results regarding motives for *TikTok* video consumption

Factors and items	Loading	α
Factor 1: Information seeking		0.92
To get information about things that interest you.	0.83	
To learn how to do things.	0.78	
To keep up with news and current events.	0.77	
Factor 2: Information giving		0.88
To provide others with information.	0.86	
To share information about your interests with others.	0.80	
To generate ideas.	0.83	
Factor 3: Relaxing entertainment		0.84
You enjoy it.	0.85	
It helps you relax.	0.85	
To pass the time when bored.	0.83	
To disconnect from your environment for a moment.	0.79	
Factor 4: Self-presentation		0.89
To feel important.	0.83	
Posting *TikTok* videos can get the attention of others.	0.78	
You can show others who you are by posting *TikTok* videos.	0.85	
You can get likes from others by posting *TikTok* videos.	0.84	
Factor 5: Social interaction		0.86
To stay in touch with other users.	0.79	
You feel like you belong to a community.	0.82	
To connect with people who share some of your values.	0.76	
Factor 6: New trend		0.82
Because it's cool.	0.80	
Because everyone does it.	0.77	
It can be exciting and interesting.	0.72	

3. Results

First, an exploratory factor analysis (EFA) was performed using *SPSS 26.0*, in which 20 items were loaded into the six different motivations, and both the reliability and the validity of the scale of six motivations were examined. Factor loadings ranged from 0.72 to 0.86, all significant ($p < 0.01$), indicating adequate convergent validity. Cronbach's alpha ranged from 0.82 to 0.92, indicating good internal consistency for all six factors.

Table 2 presents an overview of the descriptive statistics and correlations. In the six motivations, relaxing entertainment (mean [M] = 4.23; SD = 1.25) and information seeking (M = 3.61; SD = 1.14) were the motivations that received higher scores (means), while self-presentation (M = 1.90; SD = 1.33) and new trend (M = 1.69; SD = 0.76) were the motivations that received lower scores (means) among young people. The algorithm awareness level (M = 3.31; SD = 1.12) was moderate, while the *TikTok* addiction level (M = 3.59; SD = 1.19) was relatively high. Of the motivations, information seeking, relaxing entertainment, and social interaction were correlated with *TikTok* addiction. There was a negative relationship between algorithm awareness and *TikTok* addiction.

Table 2. Means, standard deviations, and correlations between motivations, algorithm awareness, and addiction (*N* = 473)

Variables	M	DT	1	2	3	4	5	6	7	8	9	10
1. Sex	-	-	-									
2. Age	20.53	1.31	.00	-								
3. Information seeking	3.61	1.14	.04	.05	-							
4. Information giving	3.13	1.34	.06	.08	.12	-						
5.Relaxing entertainment	4.23	1.25	.10	.03	.16	.09	-					
6. Self-presentation	1.90	1.33	.15	.05	.08	.15	.12	-				
7. Social interaction	3.37	1.23	.11	.06	.07	.13	.31*	.24*	-			
8. New trend	1.69	0.76	.09	.03	.05	.08	.11	.12	.05	-		
9. Algorithm awareness	3.31	1.12	.16	.11	.22*	.08	.27*	.03	.09	.05	-	
10. *TikTok* addiction	3.59	1.19	.09	.08	.27*	.17	.23*	.15	.31*	.14	-.19*	-

Note. * p<0.05

For the severity of *TikTok* addiction, Table 3 presents the data from the Likert IAT scale with five points that represent the mean and standard deviation of each item that composed it. The following statements "You stay on *TikTok* longer than you intended" (M = 4.31; SD = 1.31), "Others in your life complain to you about the amount of time you spend on *TikTok*" (M = 4.01; SD = 1.26), and "You try to cut down the amount of time you spend on *TikTok* and fail" (M = 4.32; SD = 1.09) had the highest scores (means).

Table 3. IAT adapted to *TikTok*

	M	SD
1. You stay on *TikTok* longer than you intended.	4.31	1.31
2. You neglect household chores to spend more time on *TikTok*.	3.62	1.25
3. You prefer the excitement of *TikTok* to intimacy with your partner.	3.54	1.26
4. You form new relationships with fellow *TikTok* users.	3.57	1.22
5. Others in your life complain to you about the amount of time you spend on *TikTok*.	4.01	1.26
6. Your school work suffers because of the amount of time you spend on *TikTok*.	3.48	1.23
7. You watch *TikTok* videos before something else that you need to do.	3.32	1.17
8. Your job performance suffers because of *TikTok*.	3.57	1.21
9. You become secretive when anyone asks you what you do on *TikTok*.	3.32	1.11
10. You block out disturbing thoughts about your life with soothing thoughts from *TikTok*.	3.25	1.04
11. You find yourself looking forward to when you can go on *TikTok* again.	3.63	1.12
12. You fear that life without *TikTok* would be boring, empty, and joyless.	3.50	1.23
13. You snap, yell, or act annoyed if someone bothers you while you are on *TikTok*.	3.32	1.22
14. You lose sleep because of watching *TikTok* videos late at night.	3.42	1.13
15. You feel preoccupied with *TikTok* when off-line, or fantasize about watching videos on *TikTok*.	3.44	1.21
16. You find yourself saying "just a few more minutes" when watching videos on *TikTok*.	3.61	1.26
17. You try to cut down the amount of time you spend on *TikTok* and fail.	4.32	1.09
18. You try to hide how long you've been on *TikTok*.	3.54	1.12
19. You choose spending more time on *TikTok* over going out with others.	3.41	1.22
20. You feel depressed, moody, or nervous when you are off-line, which goes away once you are back on *TikTok*.	3.56	1.21

The moderating effect is defined as a relationship between two variables (independent and dependent), conditioned by the levels of another variable (moderator), and is statistically characterized as an interaction between the independent variable and the moderator variable in a regression equation; if the *p*-value for the interaction in the regression output is statistically significant, this indicates that there is a moderating effect (**Hair** *et al.*, 2000; **Wen**; **Hau**; **Zhang**, 2005). Thus, algorithmic awareness was taken as a moderator variable; information seeking, relaxing entertainment, and social interaction as independent variables; and addiction to *TikTok* as a dependent variable. To reduce multicollinearity in moderated regression, the independent variable and the moderator variable were centralized. Then, the products of the centralized independent variables and the centralized moderator variable were calculated. Finally, a hierarchical regression analysis was performed.

Table 4 shows the results of the multiple linear regression of motivations for use, algorithm awareness, and addiction with beta weighting and *p*-values. For the model that includes addiction, a statistically significant regression equation was found ($F = 60.94$, $P < 0.001$) with an adjusted R^2 of 0.36. The adjusted R^2 coefficient of 0.36 indicated that addiction was explained by the model in 36%. The three motivations information seeking, relaxing entertainment, and social interaction presented positive and significant relationships with *TikTok* addiction, and of them, social interaction had the strongest relationship ($\beta = 0.32$) with addiction.

Table 4. Multiple linear regressions of usage motivations, algorithm awareness, and *TikTok* addiction

	β	*t*	*p*	*F*	*P*	R^2
Constant	3.45	0.00	0.00			
Information seeking	0.20	3.76	0.00			
Relaxing entertainment	0.26	7.34	0.00			
Social interaction	0.32	12.59	0.00	60.94	0.00	0.36
Algorithm awareness	−0.21	−3.65	0.03			
Information seeking × algorithm awareness	−0.09	−6.54	0.01			
Relaxing entertainment × algorithm awareness	−0.14	−3.52	0.02			

Furthermore, only the coefficient of the interaction term between information seeking and algorithm awareness ($\beta = -0.09$, $p = 0.01$) and the coefficient of the interaction term between relaxing entertainment and algorithm awareness ($\beta = -0.14$, $p = 0.02$) were significant and negative. First, this implied that the impact of the information seeking motivation on *TikTok* addiction was greater among young people with lower levels of algorithm awareness than among young people with higher levels of algorithm awareness. Second, the impact of relaxing entertainment on *TikTok* addiction was greater among young people with lower levels of algorithm awareness than among young people with higher levels of algorithm awareness.

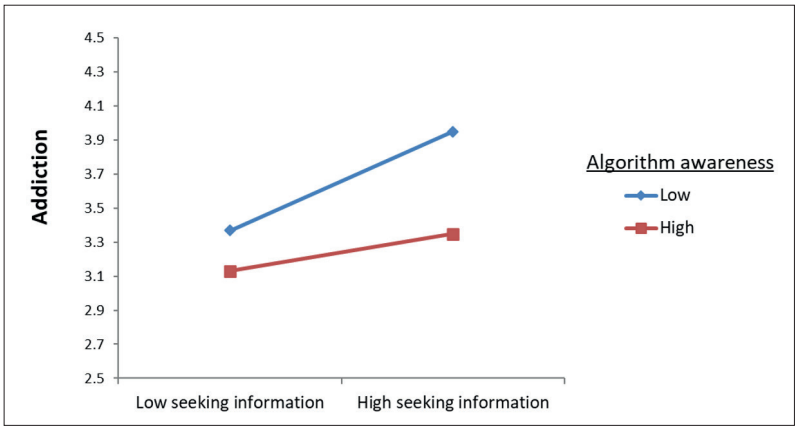

Figure 1. Moderating effect of algorithm awareness on the relationship between information seeking and *TikTok* addiction

To visualize the moderations, Figures 1 and 2 were drawn showing the effects of information seeking and relaxing entertainment, respectively, on *TikTok* addiction for the two selected values of algorithm awareness. The low level of algorithmic awareness is −1 standard deviation below the mean (2.19), while the high level of algorithmic awareness is +1 standard deviation above the mean (4.43). The two figures also indicated that the two motivations both have positive relationships with addiction, and young people with lower levels of algorithm awareness are more likely to be addicted to *TikTok* because of these two motivations.

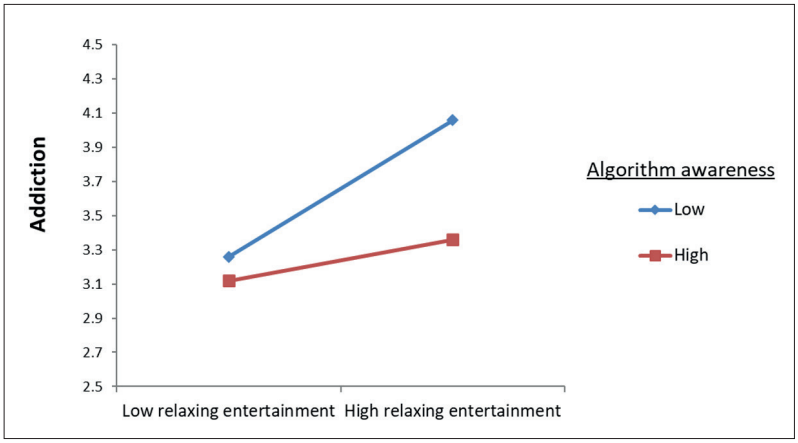

Figure 2. Moderating effect of algorithm awareness on the relationship between relaxing entertainment and *TikTok* addiction

4. Discussion and conclusions

In summary, the findings of the current study matter because it is the first time that the young people's motivational factors for *TikTok* consumption in the post-lockdown (Covid-19) period have been assessed in the context of existing literature. Also, as there has recently been increasing academic attention to perceptions of and reactions to algorithmically created content in online media, the validated AMCA scale, rather than the simple one-item self-report, developed by **Zarouali**, **Boerman** and **De-Vreese** (2021), was used for the meaningful and reliable measurement of the level of awareness of *TikTok*'s algorithm, and its moderation effects on the relationships between specific motivations and the level of addiction were also calculated.

The hypothesis that the main motivations in the consumption of *TikTok* videos were information, entertainment, social interaction, self-presentation, and new trend was verified. First of all, most young people consider relaxing entertainment and information seeking to be their main objectives, as reflected in previous studies of the motivations for engagement with audiovisual content according to the perspective of the uses and gratifications theory, in which the most important are usually entertainment, relaxation, and escapism (**Igartua**; **Humanes**, 2004). In the specific context of *TikTok*, our results regarding motivation are also consistent with previous research (**Omar**; **Dequan**, 2020; **Falgoust** *et al.*, 2022). Regarding information seeking, for the young people, *TikTok* could present several opportunities for the concise and effective dissemination of knowledge in many different fields of science (**Fiallos**; **Fiallos**; **Figueroa**, 2021), and as an open educational resource, it could even produce a considerable improvement in academic performance (**Rodríguez-Licea**; **López-Frías**; **Mortera-Gutiérrez**, 2017). But, on the other hand, it is important to take into account that the capability for entertainment and having fun has become more significant in their digital leisure practices on *TikTok*. For example, interesting short videos of products posted on *TikTok*, with the algorithm capturing demand and evaluating their preferences, could effectively reach these young people, thus imposing a strong and significant effect on their purchasing decisions and allowing for easy economic returns (**Chenkov-Shaw**, 2021).

In our case, young people also consumed video clips largely for social interaction, which reflects the fact that those who were confined at home or on campus studying, deep in social isolation during a long epidemic period, were more likely to experience high rates of depression and anxiety and to have a need for socialization and release from loneliness during and after the long forced isolation period (**Imaz-Roncero**, 2020).

Upon analyzing the motivations that lead to addiction to *TikTok* videos, it was discovered that information seeking, relaxing entertainment, and social interaction turned out to be the three predictors, having relatively high levels, with social interaction being the most significant factor. This also supports previous studies that show that social interaction is an important predictor of *TikTok* addiction (**Miranda** *et al*., 2023). Taking into account the lockdown and algorithms' recommendations, it is most likely that young people are used to leveraging social networks as a way to communicate and promote interaction with others as followers or creators of video clips that are uploaded and played on *TikTok*, and thus young people become more dependent on and addicted to the platform.

The hypothesis that algorithm awareness moderates the association between motivations and *TikTok* addiction is also verified. The results obtained regarding the moderating role of algorithm awareness show that the interactions with information seeking and relaxing entertainment were significant; thus, awareness of algorithmic recommendation had a moderating effect on the association between these two motivations and *TikTok* addiction. With higher levels of awareness of the recommendation algorithm, the relationships between the two specific motivations and *TikTok* addiction would be lower.

By definition, the term "pure moderator" can be used when the moderator is not statistically correlated with the independent variable or with the dependent variable (**Soderlund**, 2023). But if there is a significant interaction effect and at the same time a significant correlation between the moderator and the independent variable, the dependent variable, or both the independent variable and the dependent variable, the moderator can be referred to as a quasi-moderator (**Sharma**; **Durand**; **Gur-Arie**, 1981). As indicated in the results, there are significant correlations between the moderator of algorithm awareness and the dependent variable of addiction/independent variables of motivations, so algorithm awareness is a quasi-moderator, and thus, it is necessary to explore the direct impact of algorithm awareness on addiction and even its mediation effect in future studies.

Another important fact to take into account is that it was revealed that the level of algorithm awareness among young people is still relatively moderate. This observation is consistent with previous studies, in which ordinary users are often unaware of how their data is collected and used and how such personalization algorithms and privacy management work (**Shin**; **Kee**; **Shin**, 2022; **Hamilton** *et al.*, 2014). Therefore, it is advisable to propose that universities promote education focused on teaching the correct and beneficial usage of *TikTok* and the understanding of algorithm recommendation and its functions to help temper the negative impact of addiction to this social network among young people.

Some limitations of this study can be noted. Our findings may not fully translate to *TikTok* usage in other countries, and there may be cultural differences regarding the content consumption. Future studies should explore samples made up of young people from other countries to yield more generalizable and reliable results. Second, the different motivations and addiction factors of viewers versus creators could also be investigated in the future. Furthermore, the present study

only used cross-sectional data, so a longitudinal design is needed in future research to facilitate the causal effect inference.

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