ChatGPT: Stream of opinion in five newspapers in the first 100 days since its launch

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Abstract

In the last decade, journalism has progressively incorporated artificial intelligence (AI) into several processes: information analysis, content extraction, audience research, and automated copywriting, among others. *ChatGPT*, which has a great capacity for interacting with people through natural language and providing a response to almost any topic, focuses on content creation. This significant technological advancement rekindles the debate on whether machines will replace humans, including journalists. Focusing on the case of the Spanish press and using the framework of studying media participation in the public debate, we are interested in the press's reaction to *ChatGPT*'s launch. Specifically, we asked the following questions: What were the issues that dominated the debate, and what voices were called upon to express their opinions? The stream of opinion on this issue was analyzed from a communication studies and discourse analysis perspective, starting with the identification of opinion statements expressed in articles of various journalistic genres conveyed by the press during the first 100 days since the launch of *ChatGPT* on November 30, 2022. We worked with 176 press articles that addressed the subject in five Spanish generalist newspapers. The results showed that the flow of opinion developed from 8 subtopics and 11 groups of voices. The prevailing opinion during this period was that *ChatGPT* is an extraordinary technological milestone, even if it makes mistakes that reveal the technology's immaturity. The main shortcomings identified were the inability to distinguish between what is true and what is false, its tendency to function as a black box, and its failure to account for the sources it uses. However, owing to the business potential that it heralds, it is clear that a real war for the dominance of AI has broken out, which makes it necessary to put regulations in place to reduce the risks of malicious use.

Keywords

Public debate; *ChatGPT*; Stream of opinion; Digital journalism; Artificial intelligence; AI; Newspapers; Press articles.

1. Introduction

On November 30, 2022, the company *OpenAI* launched the Chat Generative Pre-trained Transformer (*ChatGPT*), an artificial intelligence (AI) chatbot prototype that was astounding owing to its ability to mimic human language and create text with great precision and detail. In the last decade, AI has been influencing broad sectors of society. In part in recognition of this, the *FundéuRAE* in Spain, sponsored by the *EFE Agency* and the *Royal Spanish Academy* (*RAE*), determined that "artificial intelligence" should be the word of the year owing to the multitude of such applications that are having an impact on society (*FundéuRAE*, 2022). In this context, *ChatGTP* has powerfully reignited the debate around technology's ability to replace humans in various tasks, including journalism.

The transformations that journalism has undergone during the last 40 years are extremely significant: first, the changes stemming from the emergence of the Internet and digitization; then, broadband and the development of social networks; and more recently, the wide range of possibilities that the application of AI is opening up. The integration of AI tools is already a reality in plenty of newsrooms (**Linden**, 2017). Currently, AI is involved in the journalistic production process in a variety of tasks: content extraction, identification of news events, audience research, and copywriting automatically or assisted by software (**Diakopoulos**, 2019). In several European countries as well as Japan, there are already news media outlets that publish text and videos that are entirely machine-generated, the so-called synthetic media (**Ufarte-Ruiz**; **Murcia-Verdú; Túñez-López**, 2023). However, studies have also found that the opportunities to interact with AI tools are still limited (**Sánchez-Gonzales**; **Sánchez-González**, 2020).

In recent years, there have been reviews of scientific publications in the area of AI, showing its contributions and advances in the fields of communication and journalism (**Calvo-Rubio**, **Ufarte-Ruiz**, 2021; **Parrat-Fernández** *et al*., 2021) or in other fields, such as education and social services (**Incio-Flores** *et al*., 2022; **Alvarado-Salazar**; **Llerena-Izquierdo**, 2022; **Minguijón**; **Serrano-Martínez**, 2022; **Thomas** *et al*., 2023; **Dogan**; **Goru-Dogan**; **Bozkurt**, 2023) and physics (**Gurrola**; **Ramírez-Reyes**; **Mora-Gutiérrez**, 2020), to name but a few. AI has also begun to transform traditional research practices in many areas (**Wagner** *et al*., 2022).

A recent study by **Sánchez-García** *et al*. (2023) concluded that the incorporation of AI is concentrated primarily in distribution and the relationship with the audience, secondarily in the collection of information, and to a more limited extent, in the automated production of news. Thus, for some, AI integration cannot replace journalists, but it will allow to them to dive deeper into the information provided and strengthen their connection with the audience (**Marconi**, 2020); however, for others, attention should be paid to the negative effects of incorporating it into the media:

> "The inclusion of these 'machines' into the newsrooms has initiated various debates ranging from aspects linked to journalistic quality and the reliability of the news generated to deontological issues and reflections on the precariousness of the sector" (**Tejedor** *et al*., 2022, p. 2).

Technology companies agree on three ideas about Spanish media's interest in implementing AI: "slowness", "distrust", and "lack of knowledge" (**Sánchez-García** *et al*., 2023). In this regard, these authors point out:

> "The technology companies consulted themselves confirm that, in comparison with other sectors more advanced in AI, the media sector reflects 'slowness,' 'distrust,' and 'lack of knowledge,' which they attribute to issues of financial difficulty, fear of labor restructuring, and short-sightedness regarding profitability (**Sánchez-García** *et al*., 2023, p. 13).

Other research has found that journalists have a profound lack of knowledge regarding AI's direct influence on their profession (**Túñez-López**; **Toural-Bran**; **Cacheiro-Requeijo**, 2018).

In this context and within the framework of studying the press's meaningful participation in the public debate through the opinions it conveys, we are interested in determining how the Spanish press has reacted to the launch of *ChatGPT*. Specifically, we ask the following questions: What were the issues that dominated this debate, and which voices were called upon to express their opinions? Addressing these aspects will allow us to understand the strategies and discourse that mobilized the newspapers in response to a disruptive news event in what could be the first moment of a debate about a global phenomenon that encompasses broad spheres of social life.

From a communication studies and discourse analysis perspective, we focus on texts as material objects produced in a given social and historical context. We are interested in revealing the opinions that expressly circulate in newspapers, which has been called the stream of opinion (**González-Arias**; **Campos-Rojas**, 2020; **González-Arias**; **Álvarez**; **Bustamante**, 2022). Starting from the idea that expressing an opinion corresponds to taking a position on a disputed issue, opinion can be studied by identifying the statements that express a point of view (POV) and, from them, identifying the issues they question and the voices responsible for those points of view. To this end, we set ourselves the objective of characterizing the stream of opinion generated in five Spanish newspapers in relation to the release of *ChatGPT*. For this purpose, we worked with a corpus of 176 press articles of different genres published by five Spanish generalist national newspapers: *El País* (*elpais.com*), *El Mundo* (*elmundo.es*), *elDiario.es* (*eldiario.es*), *infoLibre* (*infolibre.es*), and *La Voz de Galicia* (*lavozdegalicia.es*). All open-access articles that included the word "*ChatGPT*" that were published in the first 100 days from its launch were collected.

This research describes the specific participation of five generalist newspapers in the public debate sparked by the release of *ChatGPT*. Determining how the media have reacted to this phenomenon is intended to contribute to understanding the press's participation in the public debate and to complement the knowledge we have regarding the integration of new technologies into journalism.

2. State of affairs

ChatGPT was launched on November 30, 2022, by the company *OpenAI*, which specializes in natural language dialog. According to this company, it is a prototype AI chatbot that belongs to a language model trained using unsupervised learning and reinforcement techniques (*OpenAI*, 2022). This tool, which was made available to the general public, stood out for its detailed and articulate responses that closely mimic human speech. *ChatGPT* works with 175 million parameters with information recorded until 2021, so it can provide an answer to any question posed, in a number of different domains.

Although it was not the first artificial intelligence software, *ChatGPT* was the first to cause a real stir regarding the implications of the widespread use of AI in the societies of the third millennium and, in particular, its impact on the field of technologically mediated communication worldwide.

In the communication field, the boom in research papers on AI occurred in 2015 (**Calvo-Rubio**; **Ufarte-Ruiz**, 2021) as a result of the initial experiences of incorporating AI into the US newspaper industry to mechanize search and classification functions (**Linden**, 2017; **Flores-Vivar**, 2018). In the final years of the second decade of the millennium, rapid changes in technologies alerted them to the adaptation and reshaping of journalism hand in hand with AI (**Broussard** *et al*., 2019). In recent years, scientific interest has grown, and the number of articles by researchers from different countries on this subject of study has multiplied. Since the end of the second decade of the current century, robots and AI have already been pointed out as new challenges for journalism (**Salazar**, 2018), and since the beginning of the current decade, papers have been published on the advances of AI and its application by some media outlets (**De-Lima-Santos**; **Salaverría**, 2021), the impact on the media ecosystem (**Túñez-López**; **Fieiras-Ceide**; **Vaz-Álvarez**, 2021), the impact on journalistic practices in some countries, and expectations in some media, as well as future prospects (**Canavilhas**, 2022; **De-Lima-Santos**; **Ceron**, 2022).

As the impact of AI on journalism has grown, experts, journalists, and academics have expressed their conviction that AI will improve journalists' skills and increase production efficiency, but they have also expressed that a change of mindset is needed in the media environment and in facing the renewed ethical debates it raises (**Noain-Sánchez**, 2022). However, there is a leading trend in the European Union that holds that AI will improve policy-making, provision of public services, and internal management (**Van-Noordt**; **Misuraca**, 2022). At the same time, in view of the changes that are emerging in society in general and in the field of communication in particular, proposals have emerged to call for a research agenda for human–machine communication that sets as a starting point the differences between communicative AI and previous technologies that were the focus of communication research (**Guzman**; **Lewis**, 2019).

Based on this systematic review of research conducted in recent years, the most recent research in the field is related to the identification of the social and epistemological challenges posed by the adoption of communicative AI, with the media concerned about the defense of their editorial independence and journalists about the loss of jobs and the challenge of using them in their work to help produce content with greater added value and better quality (**Peña-Fernández** *et al*., 2023). *ChatGPT*'s release has heightened concern in the field of journalism regarding how it will affect it and how it can be used for journalistic tasks at a time when the number of synthetic media and newsrooms without journalists is increasing (**Ufarte-Ruiz** *et al*., 2023). Hence, there is a need to determine the streams of opinion relayed by the media on these issues upon *ChatGPT*'s release, which has its capabilities and limitations, but which heralds important transformations for the practice of journalism (**Pavlik**, 2023).

3. Stream of opinion in the media

The media contribute to public debate in different ways, mainly because they have the capacity to determine the circulation of information and opinion in the public space. Certainly, this participation is not neutral, as if they were mediators in a debate; rather, they take up a position according to their editorial line, including their own political and economic interests, for example, when selecting and prioritizing the content they offer to their audiences (**Girard**, 2012; **Califano**, 2015). In this way, the media can become involved in certain issues to varying degrees, which would have an impact on the process of democratic deliberation, making them important social actors.

In accordance with diverse research interests, multiple ways of studying opinion, from focus group techniques to the ever-popular opinion polls, have been proposed. Opinion is commonly understood in contrast to facts: opinion is subjective, while facts are objective. On this subject, see **Myers** (2004), who discusses at length the conditions of what counts as opinion. In a discursive framework, opinion falls within the scope of argumentation, whose central element is a locutionary act in which a speaker relates an issue to themselves, revealing their position regarding what they are talking about (**Charaudeau**, 2003).

In light of two central aspects of journalistic discourse –its polyphonic character (**Bakhtin**, 1981; **Chatzikoumi**; **González-Arias**, 2022) and its argumentative dimension (**Amossy**, 2000; **Charaudeau**, 2021)– we turn to the notion of the stream of opinion (**González-Arias**; **Campos-Rojas**; 2020; **González-Arias**; **Álvarez**; **Bustamante**, 2022) to systematize the analysis of a newspaper's participation in the public debate regarding a particular topic and during a given period of time. In this context, the stream of opinion is the set of opinions conveyed by the press through the text it publishes. To study the stream of opinion, we start by identifying a statement that expresses a point of view. From this statement, a voice responsible for said opinion can be recognized and, at the same time, so can the debate in which it is framed (**Plantin**, 2012). This opinion, expressed through one or more points of view, may be issued by the author of the text being studied, or it may be attributed to another actor through a direct or indirect quotation. Additionally, the debate refers to the specific topics or subtopics about which a point of view is expressed. The debate emerges upon the statement of opinion, since expressing a point of view always implies questioning the issue being debated.

4. Methodology

From a communication studies and discourse analysis perspective, we propose a qualitative study based on data extracted from a textual corpus of Spanish national newspapers. The corpus consisted of 176 articles published during the first 100 days since the public launch of *ChatGPT* on November 30, 2022. The articles correspond to different journalistic genres. The two criteria used were the inclusion of the word "*ChatGPT*" in the text and the time period established. The articles were collected using the *Factiva* database, which allowed us to collect all the articles published in open access during that period.

https://global.factiva.com

The five media outlets were chosen for their audience penetration and for being representative of different sectors of the Spanish press ecosystem. *El País* and *El Mundo* were chosen because they have two distinct generalist editorial lines, with the former being center-left and the latter being center-right, and because they are among the top five in circulation, according to the *Office for the Justification of Diffusion* (*OJD*), representing the "traditional journalistic brands". In contrast, *elDiario.es* and *infoLibre* are digital native media outlets that are among the most consolidated media outlets in Spain. Both are left-wing, but they are differentiated by the fact that *infoLibre* has a partnership agreement with a French media

outlet, *Mediapart*. Additionally, we added a regional media outlet because this group has a higher degree of credibility among its readers according to the *Digital News Report Spain* 2023 (**Kaufmann-Argueta**, 2023). Specifically, *La Voz de Galicia* was included because it has high audience ratings and belongs to a Spanish autonomous community with a significant number of local media outlets, so we consider it to represent the role of regional media well. With this selection, we sought a balance within the various editorial lines and the news attention they devote to science and technology topics. The sample has, therefore, an objectifiable part with broadcast and audience data and a convenience sample part. It should be noted that the newspapers *El Confidencial Digital*, *El Huffingtonpost*, and *El Correo Gallego* were also selected initially, but were discarded owing to the low number of articles we were able to obtain on the subject during the period.

Table 1. Number of articles in the corpus

Newspaper	Articles
El País	47
El Mundo	21
La Voz de Galicia	52
elDiario.es	44
infoLibre	12
Total	176

Table 1 presents the number of articles per newspaper that were actually analyzed.

Procedures

The analysis was carried out with the support of *AtlasTi 8.0*, a qualitative analysis software that facilitates the coding and grouping of codes. Only one document was generated per newspaper. The inductive analysis consisted of four main stages:

(a) Identification of opinion statements, which were coded with a point of view and voice responsible for the statement.

(b) Grouping of the points of view into subtopics by semantic similarity.

(c) Grouping of voices into general categories associated with social roles (researcher, businessman, politician, etc.).

(d) Analysis of relationships between code categories and documents.

To illustrate the coding, an example of the analysis extracted from the corpus studied is presented:

"It is necessary to study and analyze the uses and risks of this innovative technology with the aim of creating robust legislation that turns artificial intelligence into an ally and not an enemy because, if there is one thing we know, it is that it is here to stay" (*El País*, January 23, 2023, Paula Santolaya de Burgos).

POV: Legislation is needed to control the uses and risks of AI.
Voice: Journalist. Paula Santolaya del Burgo.
POV group: The need for regulation and control of the development of AI tools.
Group of voices: Author of the newspaper article.

The categories used in the voice code groups and topic code groups were determined by abstraction based on the recurrence of the positions that reflect these opinions.

5. Results

Below are the findings that allow us to characterize the stream of opinion that was produced during the first 100 days since the launch of *ChatGPT*. This covers the period from November 30, 2022, to March 9, 2023. It should be noted that the methodology used favors the general and abstract view of the debate, thus losing sight of the opinions of particular individuals or specific points of view. In the same sense, the opinions could be issued by the authors of the articles as well as by the persons who are quoted. Likewise, the opinion statements conveyed by each newspaper are identified without considering the journalistic genre.

In the first stage of the analysis, 530 quotations of statements expressing an opinion were identified. This number was reached by extracting the first 106 quotations from each journal. The number 106 corresponds to the maximum number of citations extracted from *infoLibre*, the newspaper in our corpus that had the least news items. These quotes were coded into 90 points of view (POV) and 166 different voices. In turn, the POVs were thematically grouped into 8 subtopics and the voices into 11 voice groups. Table 2 summarizes the relationship between citations, codes, and code groups.

Table 2. Quotations, codes, and groups

	90 POV codes	8 POV groups (subtopics of the debate)
530 quotations of opinion statements	166 voice codes	11 groups of voices

5.1. Subtopics of the debate

As noted above, the debate brought on by *ChatGPT*'s release was structured around eight main subtopics. Table 3 presents the subtopics ordered from highest to lowest recurrence, as well as the percentage they represent according to the number of textual citations (*N* = 530). These eight topics reflect what we could call the first moment of public discussion about *ChatGPT*'s release, which would correspond to approximately the first three months.

Table 3. Subtopics characterizing the stream of opinion on *ChatGPT*'s release

Subtopic of the debate on *ChatGPT*'s release	Total
The need for regulation and control of the development of AI	22.9%
ChatGPT's limitations as an AI tool	21.7%
ChatGPT's capabilities as an AI tool	18.6%
Implications of *ChatGPT*'s release in the technology industry	10.8%
The innovation signaled by *ChatGPT*'s release	10.2%
The impacts that *ChatGPT* has had or could have on education	6.9%
The impacts that *ChatGPT* could have in the workplace	6.0%
The impacts that *ChatGPT* could have in the field of journalism	2.7%

It should be noted that *ChatGPT* was made available to the general public free of charge. This may explain why, at first, there was concern about its effects on education and about the potential for the tool's use for plagiarism in schoolwork. Something similar occurred when it came to the threat that could be felt in relation to certain jobs where a generative program could replace people. However, the discussion about it's extraordinary capabilities brought the focus to the competition to dominate the AI development that was beginning to take place between technology companies in the sector. At the same time, scientists and journalists were highlighting *ChatGPT*'s limitations: biases, errors, and operating costs, which oriented the discussion more toward the illusion that the tool's potential could create. Finally, the main topic was the need to control and legislate the development and use of AI, as the negative consequences of their uncontrolled development began to be noticed, mainly owing to the competition for technological dominance in the market.

It could be pointed out that the public debate reflects a widespread general interest in the fields of education and work and a more academic interest that focuses on advances in technology. Below, we describe each of the topics, the predominant points of view, and the scope of the discussion.

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5.2. The need for regulation and control of the development of AI

As can be seen, 22.9% of the POVs were focused around the need for regulation and control of the development of AI. This aspect of the debate has local, national, and international scope. At the local level, institutions such as universities and educational centers in various countries are beginning to announce the measures that will be implemented to mitigate the negative effects of the emergence of generative technology that are affecting the teaching and learning processes. At the national level, governments are being called upon to develop initiatives to regulate the development and use of AI systems. At the international level, the debate focuses on the responsibility of the companies that are capable of developing AI technology themselves.

The main POVs that made up this group were as follows:

> Legislation needs to control the uses and risks of AI.
> Machines created with AI present the black box problem: they work, but we do not know how.
> Technology needs to be developed on ethical principles.
> Training AI tools has significant human labor costs.
> Competition between companies can lead to decisions that are detrimental to users.

As we can see, the prevailing view was that the use of AI softwares such as *ChatGPT* carries significant risks that demand state intervention to prevent them from becoming instruments of abuse or causing social harm. In addition, both developers and users are required to incorporate ethical principles to protect the public interest. The problem presented by machines trained by deep learning and the lack of design in their operation was discussed: Machines will help us solve problems, but since we do not know how they work, we could make big mistakes. Additionally, it was stated that the development of these tools has required many hours of people working in tasks aimed at eliminating harmful content circulating on the network. These jobs have usually been performed by low-paid workers. And another aspect considered in this group is that, because competition for AI dominance among large technology companies is very aggressive, there is a risk that companies will decrease ethical controls for bringing programs to market. At the same time, it was recognized how difficult it is to legislate in this regard, owing to the complexity of establishing limits between the benefits of technological development and the ambitions of the entrepreneurs who finance them.

5.3. *ChatGPT*'s limitations as an AI tool

At a level very close to the previous subtopic, with 21.7%, opinions were expressed regarding *ChatGPT*'s limitations: its inability to distinguish between what is true and what is false, the biases derived from its training, and the errors of use detected in tests carried out by both journalists and users in general. This aspect of the discussion focused on the tool itself. It is possible to observe that there is an interest in shattering the illusion the system generated at its launch and to consider its real value in its current state of development.

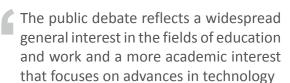The following views were the most common in this group:

> *ChatGPT* makes significant mistakes.
> *ChatGPT* does not have the ability to distinguish between what is true and what is false.
> *ChatGPT* is an immature technology.
> *ChatGPT* is not truly a general AI.

Regarding the limitations of *ChatGPT*, the most common opinions pointed to the errors that it made in relation to scientific knowledge or to the impossibility of offering objective information with the corresponding sources. The main weakness of the tool is that, in light of its responses and what is known about its operation, it fails to

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differentiate between what is true and what is false. This makes it an unreliable tool for important matters. It is described as an immature program, although with varying degrees of optimism, it is expected to improve. Another important aspect is the question of the gap between the results obtained by *ChatGPT* and the idea of achieving a machine that really operates as a general artificial intelligence, i.e., that reasons like a human when faced with any subject.

5.4. *ChatGPT*'s capabilities as an AI tool

The subtopic that came in third is clearly positive. At 18.6%, all opinions regarding *ChatGPT*'s capabilities as an AI tool align. These qualities position *ChatGPT* as an example of the advances in AI development and as a flagship program for the future of technology. This aspect of the debate also focuses on *ChatGPT* as a tool and is based on the common interest of ensuring that technology improves people's quality of living. The most recurrent POVs were as follows:

> *ChatGPT*'s main strength is its ability to interact in a user-friendly way.
> *ChatGPT* is a successful artificial intelligence.
> *ChatGPT* is an important preview of what can be done in the future.
> *ChatGPT* can replace humans in a variety of tasks.
> The advance of AI is inexorable.

This subtopic reflects the more positive side of the debate. The tool's capacity for interaction, especially the ability to interact in a friendly manner, providing answers to practically any topic, is enthusiastically valued. Likewise, the ability to imitate human language, even reaching a grammatical correctness that would surpass the capabilities of many humans (students, felons, ill-trained professionals, among others), is highlighted and valued. Owing to the volume of knowledge it handles, the speed

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of its responses, and its capacity for synthesis, it is estimated that it can already replace humans in various tasks. *ChatGPT* is a preview of what will be possible in the near future. It is proposed that advances in the field of AI-based technologies are generating major changes in a variety of areas of life, which will allow humans to develop other abilities or focus their attention on other matters hitherto unthinkable.

5.5. Implications of *ChatGPT*'s release in the technology industry

Regarding the impact of *ChatGPT* on the technology industry, with 10.8%, the opinions that *ChatGPT* has unleashed a feverish competition among technology giants stood out. In this regard, the debate reveals a certain level of frustration with the lack of control of market functioning at the level at which technology companies operate. It is no longer about countries; it is about technological "giants" advancing unchecked. Public interest can be seen at the international level, as these opinions warn of the social consequences that the war for the technological domination could have. The prevailing opinions were as follows:

> *ChatGPT* is a threat to *Google*.
> A war for AI dominance has begun.
> *ChatGPT* is competition for other AI systems.
> At the moment, advances in AI are going faster than their predecessors.
> Spain can become an AI technology hub.

According to the opinions amassed in this group, there is a war between giants, starting with *Google* and *Microsoft*, but it would involve all the big players in the AI-based technology industry. Likewise, the rapid development of all kinds of applications that will take advantage of the new technology is also expected. At this point, the focus of discussion shifts from the technology itself to the market.

At this point, it is also believed that Spain would have the capacity to transform itself into a technological pole, so the business opportunities for Spanish companies in the technological area were evaluated.

5.6. The innovation signaled by *ChatGPT*'s release

A subtopic in the field of innovation was considered to make a difference between the opinions aimed at assessing the tool's capabilities and limitations visible, on the one hand, and the evaluation of *ChatGPT*'s release as a historical event and its impact on public opinion, on the other. This subtopic, which came in fifth place, accounts for 10.2% of the opinions. Clearly, the issue of AI and especially *ChatGPT* is now in the domain of international public interest. It is a technology that, owing to its versatility, will affect all of humanity. The most noteworthy POVs were as follows:

> *ChatGPT* is a milestone in AI.
> *ChatGPT* foreshadows the future of AI.
> *ChatGPT* has revolutionized the international conversation about AI.
> *ChatGPT* is not the ultimate revolution.
> It is necessary to differentiate the impression produced by interacting with *ChatGPT* from what is really behind it.

Opinions converge in calling *ChatGPT* a milestone in the development of AI and, owing to its scope, a turning point in the relationship between people and machines. It has been determined that we are in the golden age of AI and that *ChatGPT* foreshadows the future. It is a revolutionary tool of progress. However, there are also less enthusiastic opinions in this group that question whether the program really does what it claims to do or whether, owing to the high implementation and operating costs, it could be the revolutionary turning point that others have been claiming.

5.7. The impacts that *ChatGPT* has had or could have on education

The sixth area of inquiry is education, with 6.9% of the occurrences. This issue may have been the first to generate public concern. The generative tool, which had been made freely available to the public, was quickly adopted by students. At this early stage, *ChatGPT* was seen as a threat to the school system and quickly divided opinions between those who called for a ban on its use and those who advocated its integration into the educational process. We can see that the debate here addresses a very generalized interest. Educational centers reacted, and numerous specialists were called upon to take a position on the issue. In this subtopic, the following POVs stand out:

> *ChatGPT* forces us to think about new educational strategies.
> *ChatGPT* presents a concern for the negative impact it may have on learning.

ChatGPT can be useful in teaching for both teachers and students.
It is necessary to educate AI users to avoid falling victim to their algorithms.
Universities will take years to deal with the integration of AI.

In general, there is concern about the negative impacts that *ChatGPT* may have on education, particularly associated with the possibility that students will be able to plagiarize work. Likewise, easy access to a tool that could make summaries, essays, and reports could be detrimental to the development of students' critical skills. From a more positive perspective, it was thought that incorporating AI into education could be beneficial for both teachers and students, which would entail an innovation challenge for both educational strategies and educational curricula. Projected to the entire population, there is a need to learn how AI systems work, to avoid being harmed by the tools themselves. Finally, as a criticism of the educational system, the idea was proposed that it will take several years for universities to effectively adapt their operations to AI and effectively take advantage of this technological development.

5.8. The impacts that *ChatGPT* could have in the workplace

Regarding the consequences of *ChatGPT* in the workplace, which reached 6%, the predominant idea is that AI will affect different professions differently and that workers will have to adapt to the imminent implementation of AI in all spheres of work. This aspect of the debate mainly addresses local and partisan interests. The specific areas in which technology can displace people are discussed. In particular, it highlights the generative potential of the tool as a threat to people. There is only a very incipient debate about the tension that could arise between the owners of companies and their workers: on the one hand, the owners of the companies have recognized the possibility of reducing costs using the new technology, while on the other hand, the workers are beginning to feel displaced by the technology. The POVs that stood out the most were the follow:

ChatGPT is the future assistant for various professionals.
We will have to learn to work with the new systems.

It is expected that *ChatGPT* will affect different professions differently; however, we will all have to adapt to the new tools, and over time, they will become our assistants. It is believed that the more routine tasks are the ones being rapidly replaced by AI, but that it is only a matter of time before machines replace people in increasingly sophisticated and complex tasks. Specifically with regard to employment, there has been a crisis in large technology companies, which has led to massive layoffs of workers. However, a new balance in the labor market would be achieved, as the demand for AI talent is expected to grow.

5.9. The impacts that *ChatGPT* could have in the field of journalism

In relation to the POVs that addressed the journalism subtopic, it is felt that *ChatGPT* and other AI developments could have a huge impact on the journalism industry thanks to the ability of machines to handle large volumes of information. In any case, a negative view predominates. The debate on this issue mobilizes diverse interests and values that challenge journalism. Mainly, *ChatGPT*'s generative nature has raised concerns about the negative effects of using the tool. The first warning is against disinformation, but the debate is mainly focused on the transformation of the industry. While AI may make journalistic work easier, it places enormous demands on journalists themselves. The main POVs of this group of codes were as follows:

ChatGPT could have a huge impact on the journalism industry.
ChatGPT can become a factory of fake news and disinformation
The effectiveness of fake news is not in the quality of the written text but in how it is distributed on the network.

Although some have gone so far as to call for the end of journalism, at least as we know it today, opinions varied. Although the idea that journalists could be replaced in various tasks was present, it was suggested that it is a threat especially for low-quality journalism. The development of tools such as *ChatGPT* will continue to be relevant for editorial and creative work. Also, considering the current state of development of AI that make major mistakes, professionals cannot be dispensed with. However, the prevailing view was that *ChatGPT* can become a factory of fake news and that AI systems can become amplifiers of disinformation, even unintentionally.

6. Differences between newspapers by subtopic

It can be seen that four of the five newspapers agreed on the first three topics: regulation and control, *ChatGPT*'s capabilities, and limitations. These issues accounted for more than 60% of the opinions, so we can see a commonality of interests in the evaluation of the tool and the assessment of its risks. The exception was *elDiario.es*, which gave more space to innovation and consequences in the technology industry. While no distinct patterns of behavior can be attributed to the newspapers, the order of priority of certain topics may reflect nuances or trends associated with editorial orientations or certain operating conditions that give preference to some points of view over others.

> It is possible to point out three ways of constructing opinion that distinguish the media studied: journalists' involvement, using sources of national specialists, or using international specialists

Table 4. Predominance of subtopics by journal

Subtopic of the debate on *ChatGPT*'s release	El País	infoLibre	El Mundo	elDiario.es	La Voz de Galicia
The need for regulation and control of the development of AI	16.7%	22.6%	32.7%	29.2%	13.5%
ChatGPT's limitations as an AI tool	17.7%	24.7%	17.3%	20.8%	28.1%
ChatGPT's capabilities as an AI tool	25.0%	18.3%	19.4%	10.4%	19.8%
Implications of *ChatGPT*'s release in the technology industry	12.5%	5.4%	8.2%	12.5%	15.6%
The innovation signaled by the *ChatGPT*'s release	10.4%	7.5%	6.1%	13.5%	13.5%
The impacts that *ChatGPT* has had or could have on education	5.2%	10.8%	6.1%	6.3%	6.3%
The impacts that *ChatGPT* could have in the workplace	11.5%	2.2%	7.1%	6.3%	3.1%
The impacts that *ChatGPT* could have in the field of journalism	1.0%	8.6%	3.1%	1.0%	0.0%

As Table 4 shows, *El País* gave preference to POVs highlighting *ChatGPT*'s capabilities and devoted somewhat more attention than the other newspapers to issues associated with *ChatGPT*'s impact on the workplace. In contrast, *Infolibre* and *La Voz de Galicia* emphasized the limitations of the tool, but expressed different interests regarding the effects of AI on the technology industry. For their part, *El Mundo* and *Diario.es* converge in broadly giving preference to opinions on the need for regulation and control of AI's use.

7. Voices in the debate

A total of 530 voices were identified, classified into 166 codes and subsequently grouped into 11 groups of voices. Identifying voices allows us to determine the actors in the debate, those who directly participate when it is the author of the journalistic text or indirectly when the actor is cited in the text as a source. However, in any case, from our perspective, the voice represents, in some way, the editorial line of the newspaper on the subject. The importance of a social actor's participation in the debate depends, naturally, on the degree of specialization of the subject and the access that the journalist can have to the sources. In this sense, the opinion of those who write the articles that are published or publish the opinions of others acquires a strategic character.

As Table 5 shows, 88% of the discussion took place among four groups of voices: "author of the article," "Spanish researcher," "foreign researcher," and "representative from a technology company." This grouping reflects the degree of specialization of the subject and a high valuation of expert voices regarding a considerably complex subject such as AI.

Table 5. Voices participating in the debate on *ChatGPT* release

Group of voices	Percentage (%)
Newspaper article's author	37.6
Spanish researcher	24.2
Foreign researcher	13.9
Representative of a technology company	12.3
Anonymous	4.0
Foreign politician	2.4
National or foreign institution	1.8
The newspaper (article's author undisclosed)	1.4
International newspaper company	1.0
Spanish politician	0.8
News agency	0.2

Although the topic of debate has proven to be of interest to broad sectors of the population, the newness and lack of knowledge of the subject limits the number of voices participating. Certainly, some voices that could have taken up more space were deemed to be absent in this case, for example, politicians, legislators, or voices from civil society. Consequently, it can be said that this first moment of public debate has been restricted, being limited to those directly involved: journalists, as animators of the debate; researchers; and representatives of technology companies.

Table 5 presents the groupings of voices in decreasing order according to the number of occurrences.

Clearly, what predominates is the voice of the authors of the articles themselves, who are mostly journalists or specialists invited by the media. This is followed by Spanish and foreign researchers as technology specialists who were called upon to evaluate the software, and fourthly by the voices of the representatives of the technology companies who are the real players behind it. Below, we comment on the first four groups of voices, since together they represent 88% of the opinions in the stream of opinion studied.

7.1. Author of the journalistic article (37.6%)

This corresponds to the person who wrote the journalistic text, which could be either a news item or an opinion column. The main POVs issued directly by the articles' authors were on various subtopics. If we consider them in order of frequency, the top six POVs in this group were the following:

ChatGPT makes significant mistakes.
ChatGPT is an immature technology.
A war for AI dominance has begun.
ChatGPT does not have the ability to distinguish between what is true and what is false.
Legislation needs to control the uses and risks of AI.
Machines created with AI present the black box problem: they work, but we do not know how.

These voices are the ones that most directly represent the opinions of journalists, who stand out for having a negative view of *ChatGPT*, where distrust and alertness prevail. Based on what has been observed, brief remarks can be constructed that reflect this positioning: *ChatGPT* is an error-prone tool, which is evidence of the immaturity of the technology behind it. Its main flaw is its inability to distinguish between what is true and what is false. Despite these problems with the technology, a war for AI dominance has begun, making it necessary to legislate to control its uses and reduce risks.

7.2. Spanish researcher (24.2%) and foreign researcher (13.9%)

This category included people presented as researchers, scientists, experts, and academics, all with backgrounds in the field of artificial intelligence. Undoubtedly, they emerge as authoritative sources to speak on the subject, and it makes sense that it is mostly national researchers who have the strongest voice.

Spanish researchers

ChatGPT makes significant mistakes.
ChatGPT does not have the ability to distinguish between what is true and what is false.
ChatGPT forces us to think about new educational strategies.

Foreign researchers

Machines created with AI present the black box problem: they work, but we do not know how.
ChatGPT is not truly a general artificial intelligence.
ChatGPT cannot be trusted with anything important at this time.

Although they highlight different aspects, both national and foreign researchers mostly agree on the negative aspects of the tool.

7.3. Representative of a technology company (12.3%)

This category included people who were presented as CEOs of companies involved in the development of the tools, for example, Sam Altman CEO of *OpenAI* and Satya Nadella CEO of *Microsoft*. In this case, these are the main players. At the national level, leading businessmen of technology companies were cited as authorized sources to comment on the event or as parties involved because of the business opportunities that could be created. The main POVs of this group were as follows:

Technology needs to be developed on ethical principles.
ChatGPT is a threat to *Google*.
Cybercriminals can use *ChatGPT* for scams.

Undoubtedly, the concern about the need for technology to be developed with ethical principles is linked to three issues encountered by the industry: the need to avoid biases in the tool's training, the need to eliminate harmful content from machine training, and the risks of increasing the gap between those who access the technology and those who do not. It is worth mentioning here that *OpenAI*, the company that developed *ChatGPT*, announced its interest in democratizing access to technology in its founding ideology. In addition, among the representatives of technology companies, the competition generated to dominate AI is the topic of greatest interest. Likewise, the concern about cybercrime, which is listed in third place, is related to the need to legislate on the use of AI and to develop cybersecurity programs to prevent crime from benefiting from technological development.

8. Groups of voices according to newspaper

We select only the first four categories to comment on, since they account for more than 80% of the voices in each of the newspapers. From the comparison of the opinionated voices conveyed by each media outlet, it is possible to identify different strategies, probably associated with their own journalistic and organizational practices. Table 6 presents the proportion of the main voices according to newspaper in columns.

Table 6. Differences between newspapers in relation to the voices they gave preference to in the debate

Group of voices	El País	infoLibre	El Mundo	elDiario.es	La Voz de Galicia
Newspaper article's author	50.5%	34.4%	22.2%	45.4%	35.7%
Spanish researcher	20.4%	51.6%	15.2%	9.3%	24.5%
Foreign researcher	5.4%	2.2%	40.4%	11.3%	10.2%
Representative of technology company	16.1%	5.4%	3.0%	16.5%	20.4%
	92.5%	93.5%	80.8%	82.5%	90.8%

As can be seen from Table 6, the stream of opinion of the newspapers *El País*, *El Diario.es*, and *La Voz de Galicia* was dominated by the opinions of the articles' authors themselves, whether they were journalists from the media outlet or invited specialists. *El País* stood out in particular with 50.5%, which reflects its journalists' involvement in the subject and, probably, the established capabilities of people dedicated to the technology area in the media. In contrast, *infoLibre* was dominated by Spanish researchers' voices; that is to say, it offered articles with voices of specialists from national universities and centers. It is clear from this practice that the newspaper's strategy was to seek authoritative sources at the national level that could explain and evaluate the tool. For its part, *El Mundo* preferred the voices of foreign researchers. Another striking difference was between *La Voz de Galicia*, which had a preference for the voices of representatives of technology companies (20.4%), and the newspaper *El Mundo*, which had a very low percentage in this category (3.0%). In this case, the distinction occurred because *La Voz de Galicia* gave preference to the voices of local entrepreneurs who have seen the development of *ChatGPT* as a business opportunity.

> " Regarding the voices that have been called to participate in the debate, the voices of the journalists themselves, who directly express their opinions in their articles, stood out –those who, in turn, have preferred as sources mainly Spanish researchers and foreign researchers, whose voices have unpacked the characteristics of *ChatGPT* and AI "

9. Discussion

Technology has always played an important role in the development of modern journalism, from its beginnings to the computerization of newsrooms (**Vázquez-Herrero**; **López-García**; **Irigaray**, 2020). It is also suggested that, since the creation of the so-called Internet Galaxy (**Castells**, 2001), emerging technologies have been fueling disruptive innovations (**Christensen**, 2003) that are stressing the communication ecosystem, which is currently searching for business models that will allow it to survive. Certainly, technological evolution has been the main driver of changes in journalism in the third millennium (**Pavlik**, 2000) while, at the same time, opening up new scenarios for communication processes in the media ecosystem. All these changes in journalism have had consequences for social organization and democracy. Undoubtedly, recent technological advances associated with the development of AI will impact not only journalism but also social life in general.

Although in the recent past it has been found that Spanish journalists have a profound lack of knowledge regarding AI's direct influence on the profession (**Túñez-López**; **Toural-Bran**; **Cacheiro-Requeijo**, 2018), it would be interesting to consider the opinions that journalists are pouring into their work. Probably, as workers, journalists also view their jobs as threatened and note an increase in the precariousness of their working conditions. This is in contrast to a business outlook that views technology as an opportunity to gain competitive advantages and to reduce costs.

This paper reveals that, at first, *ChatGPT*'s release caused concern primarily in the fields of education and work, probably because it was made freely available to the general public and because it is a concrete example of AI technology. This is probably because AI applications have already widely impacted fields such as entertainment, medicine, the automotive industry, retail, and logistics.

As can be seen in the stream of opinion generated in the press, a negative view of *ChatGPT* predominates. Although it is recognized that *OpenAI*'s program has extraordinary capabilities as a chatbot model, those same capabilities and potentialities transform it into a danger, either because it will be able to replace humans in various tasks, because it makes mistakes that go unnoticed owing to the correctness of language and fluency, or because the competition to dominate the AI market pushes aside the ethical criteria that are expected to accompany technological developments.

Journalism is still necessary for the functioning of plural societies in the third millennium (**Moe**; **Ytre-Arne**, 2021). However, the changes experienced in society and in the media ecosystem (**García-Orosa**, 2021) make it advisable to rethink journalism through bold formulas that are appropriate to the moment in which we are living, so it can continue to fulfill its role in the new social, political, and economic context (**Zelizer**, 2017).

No conclusive observations can be made regarding the differences between the newspapers. The results show a large overlap in the main groups of POV appearing in the different types of newspapers studied. However, it can be pointed out that the coincidences are stronger with respect to the invited voices than to the subtopics addressed. Preferences for some voices over others could reflect orientations in the practices and conditions under which opinion sources are managed. In this sense, we could say that newspapers differ in the position held by the opinions of journalists, national specialists, or foreign specialists.

In this regard, a study focused on the media ecosystem in Flanders that explored the inclusion of different voices in migration news demonstrates that the traditional media do not behave differently than the alternative press when it comes to including a variety of voices. However,

> " Since it is an explosive phenomenon, it is possible to think that not all newspapers were prepared to face the topic with a well-founded position in their editorial line "

alternative newspapers (digital natives) are differentiated according to their right-wing or left-wing political orientation: those on the right give preference the voices of right-wing politicians and those on the left, civil society actors (**Buyens**; **Van-Aelst**, 2021). In our case, to make observations in this sense, it would be necessary to have a textual corpus with other characteristics.

Regarding the Spanish media ecosystem's incorporation of technology, although criticism has been voice that, in Spain, the technological offering of AI applicable to journalism contrasts with the media's slowness in incorporating it (**Sánchez-García** *et al*. 2023), such slowness may be prudent, given the many questions being raised about the incorporation of AI technology.

> The topic that has prompted most opinions is the need to legislate for adequate control of *ChatGPT*'s uses. The need for control is based both on AI machines' capabilities and their limitations and, above all, on the fascination that has arisen at various levels with the unimaginable potential in terms of the applications it could have

Just as the food, pharmaceutical, and automotive industries cannot bring a product to market that does not meet certain safety standards, it does not seem unreasonable to ask that the AI technology industry ensure that its products will not do harm in society or have a great potential for malicious use before going to market.

10. Conclusions

In this study, we set ourselves the objective of characterizing the stream of opinion generated in five Spanish newspapers in relation to the release of *ChatGPT*. This research covers the first 100 days since *ChatGPT*'s launch in a limited portion of the Spanish press. However, we believe that it is a good reflection of the main characteristics of the studied newspapers' participation in the public debate that has been generated. This is a debate that is very focused on the properties of the tool and has been fueled primarily by AI specialists.

We can point out that the press studied reflects a rather negative and distrustful attitude toward AI. The debated subtopics reflect the areas of interest sparked by *ChatGPT*'s release: the innovation of the tool; its capabilities and limitations; the possible effects in the educational field, and in the workplace, particularly in journalism; and the social impact it has had on the technology industry. The topic that has prompted most opinions is the need to legislate for adequate control of the tool's uses. The need for control is based both on AI machines' capabilities and their limitations and, above all, on the fascination that has arisen at various levels with the unimaginable potential in terms of the applications it could have.

Regarding the voices that have been called to participate in the debate, the voices of the journalists themselves, who directly express their opinions in their articles, stood out –those who, in turn, have preferred as sources mainly Spanish researchers and foreign researchers, whose voices have unpacked the characteristics of *ChatGPT* and AI.

There are some differences between the newspapers studied, probably owing to their editorial lines or to the operating models that are open to different sources to a greater or lesser extent. From the data, it is possible to point out three ways of constructing opinion that distinguish the media studied: journalists' involvement, using sources of national specialists, or using international specialists.

Since it is an explosive phenomenon, it is possible to think that not all newspapers were prepared to face the topic with a well-founded position in their editorial line. Undoubtedly, a follow-up study could show us an evolution of the circulation of opinion in the media as the media outlets define a clearer editorial position in the face of technological development based on AI.

A study such as this one certainly has limitations that could be mitigated by extending the media coverage or the time period of the corpus collection. Nevertheless, this research clearly describes the first moments of the debate generated by a topic that will surely remain strongly in the public interest.

It is worth mentioning that, 20 days after the time period studied in this research, on March 29, 2023, a group of more than 1,000 artificial intelligence experts and technology industry executives, through an open letter, called for a six-month pause in the training of artificial intelligence systems, arguing that it is a potential threat to humanity (**Pascual**, 2023). It is clear from this fact that the debate that took place in the first 100 days was picking up on this concern and, moreover, that apparently the debate is beginning to call into question the policy, which was completely nonexistent during this period.

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