

# Perceptions of artificial intelligence applied to journalism in Spanish podcasts: meta-journalistic discourse in audios on the radio, and in the press and fields related to journalism

*Percepción de la inteligencia artificial aplicada al periodismo en los pódcast españoles: el discurso metaperiodístico en los audios de radio, prensa y ámbitos vinculados al periodismo*



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## Abstract:

Artificial intelligence applied to journalism has driven meta-journalistic discourse that shows the debate among information professionals concerning the benefits and threats of the technology. This paper analyses the perception of artificial intelligence in journalism through radio and newspaper podcasts, the output of podcasters and in other fields related to journalism, as well as the arguments for or against artificial intelligence. Despite the tool's acknowledged usefulness for the performance of several of journalists' tasks, the study shows the persistence of wariness among

## Resumen:

*La inteligencia artificial aplicada al periodismo ha impulsado un discurso metaperiodístico que muestra el debate entre los profesionales de la información en torno a los beneficios y amenazas de esta tecnología. Este artículo analiza la percepción de la inteligencia artificial periodística a través de los pódcast radiofónicos, de prensa, producidos por podcasters y otros ámbitos vinculados al periodismo y el argumentario a favor o en contra de la inteligencia artificial. Pese a la reconocida utilidad de esta herramienta para el desarrollo de diversas tareas periodísticas, el estudio muestra la persistencia del recelo entre los profesionales ante*

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professionals due to its use in promoting disinformation and fear of the dehumanisation of journalism. Nevertheless, the debate is appropriate in the context of the Spanish media's adaptation, since it allows the impact to be evaluated, opinions and experiences to be shared, but also helps forestall the risks that any technological change entails.

**Keywords:**

Artificial intelligence; journalism; meta-journalistic discourse; podcast; Spain.

*su uso para promover la desinformación y el temor frente a la deshumanización del periodismo. Este debate, no obstante, resulta adecuado en un contexto de adaptación de los medios españoles, ya que permite evaluar el impacto, compartir opiniones y experiencias, pero también prevenir los riesgos que todo cambio tecnológico conlleva.*

**Palabras clave:**

*Inteligencia artificial; periodismo; discurso metaperiodístico; pódcast; España.*

## 1. Introduction

The debate concerning artificial intelligence applied to journalism is relatively new, in line with its recent implementation in the field. Although news automation processes began in a rudimentary manner in the 1980s with the advance of computing (Mondría, 2023), the first robotic experiments in the field of journalism date back to 2003, when the *Afghan Explorer*, a mobile robot designed to carry out basic reporting tasks in the Afghan war, opened up the door to the replacement of journalists in potentially dangerous conflict zones (*El País*, 2003). A qualitative leap came with the development of the Internet (Túñez *et al.*, 2020), which favoured computational journalism (Thurman, 2019) through the development of software specific to automated content generation (*El País*, 2010). References to these advances in the Spanish media were episodic and came from a futuristic perspective (Roberge *et al.*, 2020). However, the 2014 use of artificial intelligence for automated news writing by the *Los Angeles Times* and the *Associated Press* fostered a meta-journalistic discourse about the impact of this technology on journalism (Salaverría, 2015; Ufarte & Manfredi, 2019), something which has intensified with the emergence of intelligent or deep-learning systems (Túñez *et al.*, 2021; Mondría, 2023), such as ChatGPT, developed by OpenAI (Gutiérrez-Caneda, 2023; Lopezosa, 2023), or Gemini –by Google–. Improved versions of these tools pose new challenges, not only for the redefinition of the tasks performed by journalists (Túñez *et al.*, 2020), but also in the approach to journalism from a social and ethical perspective. The Spanish media have gone from ignorance of this new technology tecnología (Túñez *et al.*, 2018) and reflection on the changes it could bring (Salazar, 2018) about to its acceptance (Mayoral *et al.*, 2023), although its use has opened a debate that transcends the replacement of humans by machines to pose other ethical questions about the truthfulness and reliability of content and the areas of information control (Túñez *et al.*, 2020) which reveal the persistence of an attitude of distrust (Sánchez *et al.*, 2023). The *2023 Professional Journalism Report* from the Madrid Association of Journalists revealed that 85% of those surveyed were in favour of its regulation due to the ethical implications and to prevent its use to promote disinformation (Europa Press, 2023). 96% deemed it necessary to identify for the audience that content generated by intelligent systems, in line with the European Union AI Normative of March 13, 2024, point 120 of which establishes labelling as a transparency measure for the use of chatbots (European Parliament, 2024).

The benefits of artificial intelligence do not elude the threats that a sector of journalists warn about. However, the number of Spanish media that use it is increasing (Túñez *et al.*, 2021; Mayoral, *et al.* 2023), such as the Vocento group (Salazar, 2018; Ufarte & Manfredi, 2019); *El Confidencial* (Rojas & Toural, 2019); the EFE agency and RTVE (Sánchez *et al.*, 2023); *Radio Nacional de*

*España* (Bazán-Gil *et al.*, 2020); *El País* and *Newtral* (Mondría, 2023) or Gabriele, an AI Narrative software that supplies news to several Spanish media outlets (Ufarte & Manfredi, 2019).

Neither have the tremendous possibilities offered by this thriving technology gone unnoticed by the radio sector. The PRISA group has introduced artificial intelligence in different aspects of the journalistic process, such as fact-checking audio pieces, through VerificAudio, an application for detecting fake audios (PRISA, 2024), employed primarily in radio newsrooms; the personalisation of content for the audience, through the Audio Data Sentiment (ADS) project, which analyses the public's emotions associated with audios in order to improve the listener's experience, detect violent or unethical content, and adapt advertising (Cadena SER, 2022); or the use of generative synthetic voice models, such as *Victoria*, which is employed on the program *Carrusel Deportivo* and offers the listener personalised news through Alexa (Cadena SER, 2023). In the field of podcasting, *Prodigioso Volcán* has promoted collaborative initiatives between humans and artificial intelligence for the creation of audio fiction stories, such as its podcast *Relatos Sintéticos* (Prodigioso Volcán, 2022).

In addition to this progressive increase in its use, scientific output on artificial intelligence and journalism has grown significantly, especially since 2015 (Calvo & Ufarte, 2021; Parratt-Fernández *et al.*, 2021). In the case of Spain, several studies have based their analysis on consultations of professionals in the field of journalism (Túñez *et al.*, 2021; Mondría, 2023; Mayoral *et al.*, 2023), on the treatment of chatbots in the Spanish press (De Lara, 2022; Gómez-Calderón & Ceballos, 2024), on the discourse of journalists on Twitter regarding artificial intelligence and disinformation (Peña-Fernández *et al.*, 2023), and on media coverage of artificial intelligence in journalism (Parratt-Fernández *et al.*, 2024).

Other international studies on media treatment of artificial intelligence show the creation of a collective conception, forged since the emergence of the technology (Scott, 2022) and how the British and North American media have constructed a public discourse around its benefits and threats (Chuan *et al.*, 2019; Nguyen & Hekman, 2022). Public perception of artificial intelligence has been studied by Owsley & Greenwood (2022) in the United States, and by Sun *et al.* (2022) in China. Moran & Jawaid Shaikh (2022) highlight the tension in the US between industry and journalists concerning the implementation of the technology in the sector.

This work aims to contribute to the vision of artificial intelligence applied to journalism through podcasts, a format that has experienced a notable boom in recent years, following the consolidation of the Internet and media digitalisation (Alonso-Fernández *et al.*, 2022; Martín-Nieto *et al.*, 2024) by attracting a segment of young and adult audiences up to 45 years of age (Alonso-Fernández *et al.*, 2022; García-Marín, 2018; Martín-Nieto *et al.*, 2024; Martínez-Costa *et al.*, 2019) who consume news through mobile devices and streaming content. According to Statista (2024), the number of podcast listeners in Spain in 2023 exceeded three million. Traditional radio stations and newspapers have taken advantage of the trend, with the incorporation of podcasts as a strategy to attract and retain audiences (Martínez-Costa *et al.*, 2019).

The study is applied to audios from Spanish media (press and radio), as well as those created in other professional areas of the Spanish podcast sphere (Gamir-Ríos and Cano-Orón, 2022), such as communication companies, podcasters, universities and foundations affiliated with the world of journalism.

In order to achieve the research objective, other specific objectives have been outlined, formulated from the following research questions:

1. Which media outlets dedicate most podcasts to artificial intelligence in journalism?
2. What perception prevails within the benefits-threats dichotomy of artificial intelligence in journalism?
3. What is the predominating argument in its perception as a benefit or as a threat?

## 2. Methodology

A retrospective search was carried out from 2014 to May 2024, the former year being when an increase in news related to the application of artificial intelligence to journalism was detected (Parratt-Fernández *et al.*, 2024). The monitoring has been carried out in three areas: press, radio, and the “podcast sphere” and fields related with journalism, through the websites of national non-specialised newspapers, which allow topic-based searches for audios, those corresponding to radio stations and digital audio platforms. Google search has also been employed, which has allowed the completion of results with podcasts from regional newspapers and with audio pieces corresponding to entities close to the field of journalism, those whose audios are available on Apple Podcasts, Spotify, iVoox and Spreaker. A combination of words has been utilised for the search, namely: “artificial intelligence” and “journalism”; “journalistic artificial intelligence”; “ChatGPT” and “journalism”. One of the limitations of this study is the inability to detect audio pieces whose title or summary do not include the search terms employed. However, the sample is considered to be representative in terms of both the quantity and plurality of the relevant Spanish podcasts’ fields of origin.

Table 1 lists the media consulted for the podcast analysis, in which three categories have been distinguished: radio stations; press, both national and regional - among which only one podcast from *El Correo* (Bilbao) was found that deals with the subject analysed; and a third category in which audios produced by podcast journalists; educational/academic institutions and professional entities, close to the world of journalism, have been compiled.

**Table 1. Media analysed classified by categories**

<b>Radio Station Podcasts</b>
SER
COPE
Onda Zero
RNE (national broadcaster)

<b>Press Podcasts</b>
<i>ABC</i>
<i>El Confidencial</i>
<i>El Correo (Bilbao)</i>
<i>elDiario.es</i>
<i>El Español</i>
<i>El Independiente</i>
<i>El Mundo</i>
<i>El País</i>
<i>La Razón</i>
<i>Público</i>
<b>Podcasters</b>
YslaMac
Caviar
The Coffee
Traveltech
Growth Hacking Course
<b>Educational/academic entities</b>
Onda Universitaria (Universidad Francisco de Vitoria)
RadiUS (Universidad de Sevilla)
<b>Professional entities</b>
Laboratorio de Periodismo (Fundación Luca de Tena)

Source: created by the author

After listening to all the audios obtained, those with content related to artificial intelligence and journalism were selected. There are 88 units in the final balance, catalogued in an Excel database drawn up for each category analysed, and in which numerous fields have been established to ease quantitative and qualitative study (Table 2): media outlet, date, podcast title, digital link, news program/section, platform, presenters, guests/participants, duration, genre (interview, roundtable, reportage, tests with artificial intelligence applications, etc.); main/secondary topic, perception of artificial intelligence (Chuan *et al.*, 2019) in content: positive (benefits), negative (threats) or combination of both (benefits-threats); and argumentation within each perception, classified according to the arguments propounded by various authors.

**Table 2. Fields for quantitative and qualitative analysis**

	<b>Digital radio audios</b>	<b>Press Podcast</b>	<b>Podcasters</b>	<b>Educational/academic entities</b>	<b>Professional entities</b>
	<b>Radio station</b>	<b>Newspaper</b>	<b>Podcast Name</b>	<b>Medium</b>	<b>Podcast Name</b>
Medium					
Date					
Podcast Title					
Digital link					
News program/ section					
Platform					
Presenters/hosts					
Participants/guests					
Duration					
Genre/Style					
Main/secondary theme					
Perception (positive/negative/both)					
Argumentation					

Source: created by the author

The following aspects have been distinguished within the vision of AI as a threat:

- Disinformation/image manipulation/fake news/manipulation (Peña Fernández *et al.*, 2023).
- Violation of intellectual property/copyright (Díaz Noci, 2023).
- Job losses (Carlson, 2015; Kirley, 2016; Kim & Kim, 2018).
- Ethical limits/racial, classist or sexist biases (Ferrante, 2021).
- Lack of transparency regarding the sources used/authorship of the texts (Pauner Chulvi, 2023).
- Dehumanisation of the news product/loss of quality of content due to the absence of human qualities in artificial intelligence, such as humour, irony, critical and interpretive capacity or creativity (Diakopoulos, 2019; Murcia & Ufarte, 2019).
- Loss of control over artificial intelligence (Salaverría, 2018).
- Control of information by large corporations/commercial use of journalism/news (Whittaker, 2019).
- Lack of regulation (González & Sanahuja, 2023; Helberger & Diakopoulos, 2023).
- Within the positive vision, the units analysed have been grouped into the following aspects:
  - Fact-checking (Flores, 2019; Manfredi & Ufarte, 2020; Parratt-Fernández *et al.*, 2021; Newman, 2022).
  - Task automation/optimisation of journalists' work (Salazar, 2018; Túnñez *et al.* 2018; Ufarte *et al.*, 2021; Mondría, 2023).
  - Audience analysis and monitoring/detection of topics of interest to the audience/personalisation of content (Cham Olmsted, 2019).
  - Opportunity for modernisation of journalism/search for new products (Túnñez *et al.*, 2021; Pérez-Seijo *et al.*, 2023; Lopezosa *et al.*, 2024).

Furthermore, given the varied origins of the audio pieces, analysis has been applied by categories: digital audio from radio programmes; press podcasts and podcasts from entities related to the field of journalism.

### 3. Results

Table 3 shows the distribution of digital audios that address AI and journalism by radio station and year. This is the medium with the largest number of pieces and the one which offers the greatest variety, both by subjects covered and in terms of styles and types of collaborators.

Most podcasts consist of fragments of programmes, selected by monographic topic (artificial intelligence, in this case), processed and edited for streaming and made available in an archive. The user can access the audio content by searching by topic, programme or using the tag “podcast”.

**Table 3. Distribution of radio audios by year. The search was carried out until May 2024, therefore this year's data corresponds to that date**

	2022	2023	2024	Total
<b>Radio Station Podcast</b>				
SER	4	9	1	14
COPE		19	4	23
Onda Cero	1	12	5	18
RNE			1	1
				56

**Source: created by the author**

The podcasts were concentrated between 2022 and 2024, although the largest number was recorded in 2023. One of the reasons for that is the focus of audios on the launch of artificial intelligence applications that directly affect information and journalism, such as Open AI's ChatGPT in November 2022; Gemini and Bard, its counterpart on Google, or image creation and modification programs, such as Midjourney and Sora, both by Open AI, which also entered the market between 2022 and 2024. Most podcasts focused on the impact of these systems on journalism and the news. In addition to the informative and journalistic interest of these new applications, the other reason for the concentration of units in this period was the then recent incorporation and consolidation of this type of format in the media analysed; especially, in radio and in the press. Although there had been digitalised radio sound pieces in radio archives since 2005, it was not until ten years later that content began to be processed for on-demand consumption (Alonso-Fernández *et al.*, 2022), through the editing of programme fragments or news segmented by subject matter for online listening through their websites and, later, on podcast platforms.

As shown in Table 3, COPE stood out not only for offering the largest number of pieces, but also for experimenting with artificial text generation and voice simulation applications, as discussed below. Onda Cero also stood out for the quantity and variety of its audios, followed by Cadena SER. The PRISA group, in alliance with WePod and with the collaboration of other European media outlets, announced the launch in April 2024 of a thematic series entitled "AI and you" to explain the technology to the general public (Cadena SER, 2024). However, most of the audios analysed on this station correspond to radio programmes broadcast and stored in archives for on-demand consumption by users, except for *Hora 25. Negocios*, hosted by Javier Ruiz, developed expressly as a podcast (Alonso-Fernández *et al.*, 2022). Artificial intelligence and journalism have been the subject of analysis and reflection in the station's regular programming, both in the magazines *Hoy por Hoy* (Àngels Barceló) and *La Ventana* (Carles Francino), as well as in specialised culture programs (*La Hora Extra*) or, as a part of *A vivir que son dos días*, in the discussion show presented by Juan José Millás, *Las edades de Millás*. *Hoy por Hoy's* territorial programming also included roundtable shows and interviews on the topic. It is worth highlighting *Hoy por Hoy's* specialised section *Tecnología*,

with monographs dedicated to artificial intelligence with Jaime García Cantero, a specialist in the field, which offer in-depth analysis of questions directly related to radio, such as ChatGPT's ability to write radio scripts or the possibilities offered by synthetic voice applications.

The same formula is repeated in the cases of COPE and Onda Cero. However, in the former there are some variants, consisting of short audio clips from news programmes, in which a brief interview with an expert takes place, a concise opinion is voiced in the form of a column by the presenter, or clips from programmes are selected with journalists' voices cloned by artificial intelligence. In-depth treatment was provided in the podcasts by their usual magazines: *Herrera en la COPE* (Carlos Herrera), *La linterna* (Paco Delgado and Ángel Expósito), *La Tarde* (Pilar García Muñiz), *Poniendo las calles* (José Manuel Nieto) or *Lo que viene* (José Ángel Cuadrado), a programme expressly dedicated to technology. It was also treated monographically in extracts from news programmes, such as *Mediodía COPE* (Pilar Abad; Pilar Cisneros and Jorge Abad) or *Noticias fin de semana* (Cristina López Schlichting), through interviews with an expert. Onda Cero put out podcasts on artificial intelligence and journalism which also consisted of the selection of monographic fragments from broadcast programmes, edited in audio format and offered in a catalogue that allows thematic searches and by the tag "podcast". Here, pieces of their magazines *Julia en la onda* (Julia Otero), *Más de uno* (Carlos Alsina) and *La rosa de los vientos* (Bruno Cardeñoso and Silvia Casasola), are to be found, in addition to other regional programs such as *Nits de Ràdio* with David Cervelló. On the other hand, only one podcast has been found on Radio Nacional de España (RNE), corresponding to the program *Gente despierta*, by Carles Mesa. The majority of radio audios therefore consist of content from their broadcast programs processed for streaming. This explains the breadth of pieces on the radio compared to the scarcity of those found in the press, where the main product is text, therefore podcasts are complementary formats to delve deeper into topical issues.

Table 4 shows the distribution of podcasts in the press by newspaper and year:

**Table 4. Distribution of press podcasts. The search was conducted up to May 2024, therefore this year's data corresponds to that date**

	2022	2023	2024	Total
<b>Press Podcast</b>				
<i>ABC</i>		1		1
<i>El Confidencial</i>		1		1
<i>El Correo</i> (Bilbao)		1		1
<i>elDiario.es</i>		2	1	3
<i>El Español</i>			1	1
<i>El Independiente</i>		1		1

<i>El Mundo</i>	1	1	1	3
<i>El País</i>	1	6		7
<i>La Razón</i>		1		1
<i>Público</i>		2		2
				21

**Source: created by the author**

The production of podcasts by the press regarding artificial intelligence and journalism was also concentrated between 2022 and 2024, with an increase in pieces in 2023. As in the case of radio, news and journalistic interest generated by the appearance of artificial intelligence applications directly related to the news was joined by the novel incorporation of podcasts as a format in digital newspapers. *ABC* and *El País* saw the first micro-newsletters gave way to content edited for podcasts from 2021, when they were extended to all digital newspapers (Martínez Otón *et al.*, 2022).

However, within the non-specialised press there are also differences regarding the coverage of artificial intelligence in journalism through podcasts, *El País* standing out in this area with seven pieces dedicated to this topic in its *Hoy en El País* section. Ana Fuentes and Íñigo Domínguez are the presenters, with specialised journalists taking part, either in technology, such as Manuel Pascual and Jordi Pérez Colomé; or in similar fields, such as science (Raúl Limón) or data journalism, with Kiko Llaneras. Although the treatment of artificial intelligence is approached from a general perspective, the analysis in these podcasts tends towards those aspects that positively or negatively affect journalism and news management.

The other two newspapers worthy of mention for their treatment of the subject in their podcast sections are *El Mundo*, in *El Mundo al día* (Javier Attard), and *elDiario.es*, in its *Al día* section (Juan Luis Sánchez), which dedicated three pieces respectively to the topic. *Público* dedicated a series entitled *IA Desvelada*, presented by Joaquín Peña, a professor specialising in digitalisation and artificial intelligence, made up of of eight episodes available on YouTube, two of which made reference to this technology in journalism, with particular emphasis on the virtues and threats of ChatGPT in the news field. *El Correo* is the only regional newspaper that covered this subject in one of its podcasts entitled *Foco*, hosted by Marta Madruga, and in which, as will be shown later, it gauges the positive and negative aspects of the technology.

In a third category (Table 5), podcasts from journalism-related fields (professional entities, academic environments) and podcasting journalists have been grouped together, albeit in a differentiated manner. Although these are totally different areas from the previous two, it is equally interesting to know the perspective that these agents of news offer their audience, generally made up of followers of podcast-producing journalists in the first subgroup; students, potential journalists and university professors in the second; and in the third, journalism and communication professionals. Despite their disparity and being a minority, they share an interest in the emergence of artificial intelligence in journalism.

**Table 5. Distribution of podcasts by producers and years. The search was conducted up to May 2024, therefore this year's data corresponds to that date**

	2022	2023	2024	Total
<b>Professional, educational entities and podcasters</b>				
<b>Podcasters</b>				
YslaMac		1	1	2
Caviar		1		1
The Coffee	1			1
Traveltech		1		1
<i>Growth Hacking Course</i>			1	1
<b>Educational entities</b>				
Onda Universitaria		1	1	2
RadiUS		1		1
<b>Professional entities</b>				
Laboratorio de Periodismo		2		2

**Source: created by the author**

Two audios by podcasters must be mentioned at this point, one by Amador Cámara, journalist and creator of the YslaMac website - available on Apple Podcasts -, and the other by Carlos Fité and Joan Martín, directors of the podcast entitled Caviar. Three other audios have been selected because they consist of interviews with journalists focused on artificial intelligence and journalism: The Coffee, by the writer Mauricio Cabrera, which includes an interview with Kiko Llaneras, a data journalist for *El País*; Traveltech, by Aron Abarca, CEO of the online tourism agency Gran Voyage, and whose podcast offers the perspective of travel journalist Juanda Núñez; and *Growth Hacking Course*, by Jean-Noel Saunier, creator of the marketing company of the same name, and whose product has also been included in this study due to the interest offered by the interview with Beatriz Lizarraga, head of digital projects and innovation for the digital newspaper ABC.

The second group in this category is made up of two podcasts by journalist and professor Javier de la Rosa, produced by the Universidad Francisco de Vitoria and available on Spreker, and a third piece, produced by the Universidad de Sevilla radio station, available on iVoox and which includes an interview with Luis Mauricio Calvo, a journalist and professor at the Universidad de Castilla-La Mancha. The last group includes two podcasts developed by the Laboratorio de Periodismo of the Fundación Luca de Tena, hosted by journalist Lluís Cucarella and posted on Spotify.

The singularity of the set of podcasts in this section is that, unlike those linked to radio and the press which combine pieces dedicated specifically to artificial intelligence and journalism with other generic pieces, whose references to the effects on journalism are secondary, independent podcasts focus specifically on how the tool affects journalism; that is, they are audio pieces whose monographic subject matter is artificial intelligence and journalism.

There is also considerable diversity in terms of genres and styles of content presentation (Martín-Nieto *et al.*, 2024; Martínez-Costa *et al.*, 2019; Martínez Otón *et al.*, 2022), although, as mentioned above, radio podcasts are more varied, since they reproduce the characteristics of this medium by dealing with extracts of programs selected to be listened to as podcasts. However, despite the podcasts' differing origins, there is little stylistic difference in the audios, their narrative resources being highly varied. Roundtables and interviews predominate, with the participation of, in addition to journalists, experts from numerous fields: computer engineers, writers, advertising announcers, psychologists, philosophers, lawyers, businesspeople and neuroscientists. The differentiating resource in the radio podcasts is experimentation with artificial intelligence applications, consisting of interviews with ChatGPT to see how it works, or with voice simulation programmes, to show the scope of the technology in this field.

Regarding the titles of the audios, 26 (representing 29.5% of the total number of pieces analysed) made direct reference to artificial intelligence and journalism. The digital audios of radio stations stand out in this regard, with 16 headlines focused on the topic, followed by the podcasts catalogued in the third category, expressly dedicated to analysing the application of this technology to journalism, so the headlines are consistent with the content of the audios. Only one specific headline was recorded in the press. The rest of the titles of the audios, 62 (70,5%), contained a generic title. The latter include podcasts dedicated to artificial intelligence in general, in which different aspects of the technology are confronted - including those that affect journalism - therefore the treatment of journalism as a topic is secondary. Some titles denote the focus of the topic: "The challenge we face with Artificial Intelligence: How to know what's true and what's false?" (Annex I); "How Artificial Intelligence can manipulate this photo to depict a situation very different from what you see"; "Learning to use artificial intelligence as another tool in a journalist's arsenal"; "Does AI endanger the profession of journalist and communicator?"; "How to protect ourselves from deepfakes and AI misinformation".

One notable aspect is the use of the terms "robot" and "machine" to refer to artificial intelligence, which appear repeatedly in ten podcasts and shows the persistence of the conception created around this technology (Scott, 2022).

There is also great variety in the length of the audios. The average is twenty-two minutes, but the podcasts range from in-depth interviews of over sixty minutes to opinion columns of just two.

Regarding the perception of artificial intelligence in the podcasts analysed, Table 6 shows the vision in the radio audios:

**Table 6. Perception of artificial intelligence through radio podcasts**

	Positive	Negative	Benefits/Threats
<b>Radio Station Podcast</b>			
SER	1	8	5
COPE	1	10	12
Onda Cero		11	7
RNE			1
Total	2	29	25

Source: created by the author

According to these results, the dual vision predominates of artificial intelligence as a useful tool for journalism but also as one that entails threats. The attitude of rejection prevails above all in the audios of Onda Cero and Cadena SER, despite the implementation of artificial intelligence applications developed in the radio realm of the PRISA group. COPE offered a balanced vision, as well as a piece in favour of the journalistic use of artificial intelligence. The tests used as a resource to show the scope of this tool in the news field are especially important. On COPE, for example, the Risa Group, made up of journalists David Miner, Óscar Blanco and Fernando Echeverría, carried out two simulations of voices that imitated Juanma Castaño and Manolo Lama (Annex I) in which, in a humorous tone, they demonstrated the ease of manipulating the voices of public figures with false statements. The experiment was also offered as a double-edged sword, with Carlos Alsina: on one hand the ability of artificial intelligence to replace the presenter by cloning his voice, on the other the lack of human qualities, such as the interpretation of data, irony, or a sense of humour. As will be discussed below, the loss of jobs in the radio sector or the use of artificial intelligence to manipulate voices and generate misinformation are seen as among the most worrying threats for professionals in the medium.

Table 7 provides the analysis of press podcasts, where once again a balanced view predominates of the benefits and risks of artificial intelligence to journalism.

**Table 7. Perception of artificial intelligence through podcasts newspapers**

	Positive	Negative	Benefits/Threats
<b>Press Podcast</b>			
<i>ABC</i>			1
<i>El Confidencial</i>			1
<i>El Correo</i> (Bilbao)			1
<i>elDiario.es</i>			3
<i>El Español</i>			1
<i>El Independiente</i>	1		
<i>El Mundo</i>		2	1
<i>El País</i>		2	5
<i>La Razón</i>		1	
<i>Público</i>		1	1
Total	1	6	14

Source: created by the author

*El Independiente*, despite only featuring one podcast hosted by José Antonio Gelado (IntependienTech” #15, December 11, 2023) on artificial intelligence and journalism, is the only one that offers a complete overview of the benefits of applying the technology. *El Confidencial* and *El Español* point out the two sides of artificial intelligence in their podcasts, despite also being media that are utilising artificial intelligence applications: the former has AnaFut, a *bot* for the automatic generation of sports chronicles (Rojas & Tournal, 2019) and the latter has been offering its subscribers an audio-reading service created by an intelligent system since 2022 (*El Español*, 2022). This is also the case for *El País* which has, among others, artificial intelligence tools for product personalisation (Mondría, 2023), but which highlights the threats of this technology in two of its podcasts, although it also highlights its potential in five others. The negative perception predominates in the case of *El Mundo* podcasts, which support arguments related to the use of artificial intelligence to promote disinformation and the manipulation or opacity

of the control of this technology by large corporations and the consequent risk that this entails for freedom of expression. These ideas, as discussed below, form part of the journalistic argument against artificial intelligence.

Within the third category, a dual perspective on the positive and negative aspects of the use of this technology in the field of journalism again prevails, as shown in Table 8.

**Table 8. Perception of artificial intelligence through podcasts from other fields related to journalism**

	Positive	Negative	Benefits/Threats
<b>Podcasters</b>			
YslaMac		2	
Caviar			1
The Coffee	1		
Traveltech			1
<i>Growth Hacking Course</i>	1		
<b>Educational/academic entities</b>			
Onda Universitaria	1		1
RadiUS			1
<b>Professional entities</b>			
Laboratorio de Periodismo			2
Total	3	2	6

Source: created by the author

YslaMac by journalist Amador Cámara stands out with its two contributions giving a negative assessment, from an approach that summarised all the arguments against the technology (Table 9). The professor and journalist Javier de la Rosa offered a more positive perspective, displaying in one of the Onda Universitaria podcasts (2024) the option of developing a radio bulletin with artificial voices to demonstrate its usefulness in strictly informative genres. Tests with ChatGPT were another of the common resources employed in the podcasts classified in this section, with varying conclusions: negative (making up facts, sexist biases) or positive (improved writing, structuring of texts, choice of headline).

Despite the different categories based on origin, if we conceptualise the units within the digital audio sector as a whole, 51% of the podcasts analysed offered a balance between benefits and risks. However, the number of pieces with a negative view of the technology is quite significant: 37, which represents 42% of the total units in the group. Only six podcasts defended the benefits of artificial intelligence in journalism.

This shows that, as with the emergence of any new technology, the journalistic debate revolves around its proper use. Specifically in this case the debate concerns lingering fears of the improper use of artificial intelligence, and the expectation about its future development and improvement, the effects of which are as yet unknown due to its recent emergence, but whose application in those media that are using AI is proving to be of great use.

In relation to the arguments that support this debate, it should be noted that most podcasts included more than one reasoning within each perception (positive/negative). This implies that a single news piece can be classified into different sections. The objective is to show which of the aspects in favour of or against artificial intelligence in journalism are the most recurrent.

**Table 9. Negative perception of artificial intelligence in journalism. Argumentation about threats in the podcasts analysed, by category**

	Radio audios	Press podcast	Podcasters	Educational entities	Professional entities	Total
Disinformation/Dissemination of fake news/ Manipulation of images and audios	41	17	2	1	2	63
Dehumanisation of the news product (lack of humour, irony, ability to interpret and human qualities) / Loss of quality of journalism	10	3	2	1	1	17
Lack of ethical values/Racial, classist and sexist biases	10	3		1	2	16
Job losses in journalism	8	4	3			15
Lack of regulation	5	10				15
Control of the news by large corporations/ Commercial use of news	6	2	1		2	11
Violation of intellectual property/copyright	6	2	1		1	10
Lack of transparency regarding the sources used or the authorship of the content	4					4
Loss of control over artificial intelligence	2	1				3

Source: created by the author

Table 9 shows that the main objection to artificial intelligence in all categories is its use in promoting fake news and disinformation through the manipulation of images and videos. That is the hegemonic argument in the world of radio, based on the idea of artificial intelligence's ability to imitate one of the essential elements of the news, the human voice. The experiments carried out with artificial intelligence applications sought to warn about the possibility of manipulating the voices of public figures to generate disinformation, along with the feasibility of replacing announcers, which is another of the aspects that arouses the greatest distrust among journalists in the media and which falls under the section concerning fear of job losses in the sector. This was stated, for example, by Carlos Alsina in one of the podcasts on the technology, from his program *Más de uno*, in which he recognised that “artificial intelligence is usually talked about in the media from the point of view of suspicion”, especially “among those of us who fear losing our jobs as soon as artificial intelligence knows how to make a radio program, which it is already doing” (Annex I). Likewise, there were warnings that the utilisation of the tool to promote disinformation may have disastrous consequences, not only in the field of journalism, through the loss of credibility and the disaffection of society with the media, but also in the political sphere, through the destabilisation of democracies and the suppression of ideological and informational plurality.

The second argument that stands out is the dehumanisation of the news and the loss of quality in journalism. This aspect, moreover, is shown as the loophole whereby artificial intelligence will not be able to replace journalists, under the premise that the technology lacks such qualities as irony, humour or the ability to interpret facts (Diakopoulos, 2019). The dehumanisation of journalism is also related to the next most prominent negative aspect in the podcasts analysed, the absence of ethical criteria and the biases detected in the use of the technology. The loss of jobs and the lack of regulation are at the same level within the potential threats, followed by the suspicions aroused by the role of large tech corporations in the development of the technology, through multi-million-dollar investment. However, the lack of regulation of this new technology was one of the aspects that the press podcasts warned of most frequently, a call being made for the drawing-up of regulations to ensure its proper use. This attitude of distrust was also supported by the illicit use of journalistic texts to train and feed generative artificial intelligence applications, without the consent of newspapers and journalists. The opacity of the sources utilised and the loss of control over this technology occupy the last places amongst the arguments against it, which sometimes offer an apocalyptic vision of the tool's potential danger. Jordi Pérez Colomé, a journalist from *El País* specialising in technology, summarised this attitude in one of the podcasts with the expression “fear of the unknown” (*El País*, 2022).

The theses against artificial intelligence were also more varied than those supporting the benefits of its use in journalism, as shown in Table 10:

**Table 10. Positive perception of artificial intelligence in journalism. Argumentation about its benefits in the podcasts analysed, by category**

	Radio audios	Press podcast	Podcasters	Educational entities	Professional entities	Total
Automation of tasks/Optimisation of journalists' work	17	12	3	4	2	38
Opportunity for modernisation of journalism/Creation of new products	2	5		1	3	11
Audience analysis and monitoring/Selection of topics of interest to the audience/Content personalisation		3			1	4
Verifying sources and news/Detecting fake news		3				3

**Source: created by the author**

Table 10 shows that the main idea in favour of artificial intelligence in all categories is its usefulness as a tool to help and improve journalists' work, from the automated generation of texts, which is its most widespread use, to its application in journalists' varied tasks, with a broad description that covers massive data analysis (big data), text translation, transcription of interviews and videos, image generation, optimisation of writing, creation of radio program theme songs or voiceovers employing synthesised voices. Artificial intelligence also appears as a technology that can promote a beneficial transformation for journalism, by driving modernisation in the sector –similar to what the emergence of the internet and the move to the digital model meant at the time– along with the opportunity to create new products. To this end, press podcasts, in particular, highlighted the ability of artificial intelligence to conduct audience surveys and detect subjects of interest that allow the development of personalised products. The absence of any references to these uses in the world of radio is striking, it being an area where tools for audience segmentation are already being applied, such as the aforementioned Audio Data Sentiment (ADS) project by the PRISA group. Another aspect that was defended in the press podcasts is its usefulness in counteracting one of its main effects, such as misinformation and fake news, through the fact-checking of data and sources. There are several podcasts in which the need for constant supervision of automated journalistic tasks was stressed, which denotes an absolute lack of confidence in the technology. However, the need for the media to encourage professionals to train in artificial intelligence is emphasised in order to exploit its enormous potential.

#### 4. Discussion and conclusions

Despite the long history of the application of artificial intelligence to various fields (Salazar, 2018), its extension to journalism has come more recently and has been closely linked to the development of computing and the Internet (Túñez *et al.*, 2020). Nevertheless, its implementation in the Spanish media has enough of a track record to permit a perspective analysis that shows its applications, proposals and attitudes among news professionals. Since the beginning of the millennium, news items have been detected speaking of the first steps of the technology in journalism. However, the formidable development of artificial intelligence over the last ten years has led to a debate within journalism about the usage and threats of this new tool. The debate has intensified, especially since 2023, and particularly in podcasts, due to the emergence of programmes such as ChatGPT (Gutiérrez, 2023; Lopezosa, 2023; Parratt-Fernández *et al.*, 2024), Gemini, Midjourney or Sora, and the manifest ability of artificial intelligence to modify images, imitate voices and sounds and generate text autonomously. The extraordinary progress of all these developments over a short period of time has fostered their conception as disruptive technology, since the media are being forced to adapt quickly and introduce new dynamics into their professional methodologies (Túñez *et al.*, 2021; Pérez-Seijo *et al.*, 2023; Lopezosa *et al.*, 2024). The debate is very similar to that which arose with the appearance of the Internet and the digital transformation that the sector experienced only recently. However, this time the variants are different, since, if the previous technological revolution fundamentally affected the business model, the current one poses other dilemmas of ethical and social significance.

Radio offers the largest number and greatest variety of audios related to artificial intelligence and journalism within the podcast format and shows that this is a recurring subject in its content. That does not mean that it is the area showing most interest in the topic, since it is also present in other media (Parratt-Fernández *et al.*, 2024), but it does mean that, for the public that prefers podcasts for their news, radio is the medium that sets the trend in relation to perceptions of the technology in its application to journalism. *El País* alone stands out among the press in terms of audios dedicated to the issue, although a long way short of what radio offers. That is because radio utilises its main product and transforms it into a podcast, thus also facilitating the search by programs, subjects or through the tag “podcast”, as well as the option of finding them in the catalogues of the main digital audio platforms (Spotify, Apple Podcasts, Podimo, Podium, Google Podcasts, Spreaker or YouTube). The diversification of radio consumption formats has brought about an expansion of its reach, both among the traditional audience, listeners of live radio, and consumers of streaming audios. The diversification of news in the press has also received a notable boost in recent years. However, the treatment of the issue of artificial intelligence and journalism stands out in its main format, which is text (Parratt-Fernández *et al.*, 2024). It must be considered that, despite a lesser representation of the subject in press podcasts, the use of the digital audio format is used to delve into current affairs of great newsworthiness, which implies that, for professionals in the written media, artificial intelligence and journalism bring together enough interest to be treated specifically through complementary products which allow their analysis to be extended.

As regards the audio pieces in the third category, despite the diverse origin of the podcasts, the common denominator is the specific treatment of the subject, with audios expressly dedicated to the application of the tool to journalism which highlight the special attention artificial intelligence has aroused among professional journalists and in the field of academic training.

Most podcasts, as a whole, address the impact of this technology on journalism in depth, adopting a reflective and analytical perspective and utilising specialised sources to present different approaches. Radio podcasts are the ones that most commonly resort to *in situ* demonstrations of the use of artificial intelligence through voice or text generation software to show its negative or positive potential. However, despite the notable presence of journalistic artificial intelligence in the news agenda, it did not stand out as a priority topic, except in the podcasts in the last category. Radio and press audios in which it appeared as a secondary issue predominate, within pieces generally dedicated to artificial intelligence.

As for perceptions of the application of this technology to journalism and news, a balanced view prevails in all categories concerning the benefits and threats, although the number of pieces with a negative perception is quite significant, especially on the radio, where greater concern about the potential dangers of this new technology is revealed through its audios. The negative view is also quite prevalent in the press, while it is a minority in podcasts classified in the third category. The data is striking since, despite the implementation of artificial intelligence in journalism and its proven usefulness, there is still mistrust regarding the challenges and threats it may represent for this sector. It is clear, however, that journalists distinguish between professional use of the technology, with all its benefits, and the use that may be made in spheres other than journalism, such as politics or economics, which is the basis of one of their main arguments against the tool, and they therefore assign any responsibility for the potentially harmful effects of this technological development to those other spheres.

Qualitative analysis shows that, within the arguments about the negative perception of artificial intelligence in journalism through podcasts, the fear of improper use of artificial intelligence to promote disinformation and the spread of fake news stands out in all categories, an argument that has gained ground among professionals, especially from 2023 onwards, more than the loss of jobs, which at first represented the essential misgiving (Túñez *et al.*, 2021). There is also agreement on the second unfavourable aspect of artificial intelligence, which is the dehumanisation of the news, a vision that is closely linked to the ethical and social conception of journalism, and which also results in a loss of quality in journalism. That is the second most frequent argument in radio podcasts, which utilise tests with imitations of the voices of well-known announcers as a resource to demonstrate the inability of artificial intelligence to replicate the humour, irony or empathy of those being imitated. Another warning related to the idea of dehumanisation that stands out from the field concerns the risk of discrimination due to the dissemination of biased texts created by intelligent systems. That figures in all podcast categories, as indeed does the warning about the lack of ethical values. Within negative perceptions, concern about the lack of regulation is of interest, such perceptions manifesting above all through press podcasts, which show the fear among professionals in the print media about the uncontrolled use of this technology and the opacity regarding the control of information by large technology corporations for unknown purposes.

As regards positive perceptions, there is a consensus about its usefulness in aspects such as task automation and optimisation of journalists' tasks, this being seen as the most highly-valued element, with a great wealth of applications, followed by the opportunity offered by artificial intelligence to modernise journalism and create new products.

However, most podcasts address artificial intelligence in journalism from both positive and negative perspectives, so the debate is chiefly focused on the proper or improper use of the technology. In this sense, there is a diversity of opinions among journalists, as shown by the survey carried out by Mayoral *et al.* (2023), in which a large majority of those interviewed

expressed a favourable opinion of artificial intelligence, and which reveals the disparity of sensibilities that exist around the issue (Nguyen & Hekman, 2022).

It would be interesting to extend this analysis to other media such as television. Similarly, it would be pertinent to carry out comparative research, by contrasting the meta-journalistic discourse in different countries to understand the varying sensitivities of professionals with respect to the implementation of artificial intelligence in journalism.

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The author declares that there is no conflict of interest contained in this article.

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## 8. Annex

## Annex I. List of podcasts cited in the analysis

Medium	Podcast Title	Date	Program of origin	Link
<b>Radio podcasts</b>				
COPE	<i>Juanma Castaño listens to how artificial intelligence makes his program and this happens: "Last season"</i>	12/10/2023	<i>El Partidazo de COPE</i>	<a href="https://bit.ly/3VibtwD">https://bit.ly/3VibtwD</a>
COPE	<i>Paco González reacts to the latest AI creation: "If you are driving..."</i>	09/23/2023	<i>Tiempo de Juego</i>	<a href="https://bit.ly/3XgIxrK">https://bit.ly/3XgIxrK</a>
COPE	<i>The challenge we face with Artificial Intelligence: How to know what is true and what is false?</i>	06/17/2023	<i>Fin de Semana</i>	<a href="https://bit.ly/3VcZr7x">https://bit.ly/3VcZr7x</a>
COPE	<i>This is how Artificial Intelligence can manipulate this photo to reflect a situation very different from what you see</i>	04/04/2023	<i>Lo que viene</i>	<a href="https://bit.ly/4c5E9QN">https://bit.ly/4c5E9QN</a>
Onda Cero	<i>How to protect ourselves from AI deepfakes and misinformation?</i>	03/15/2024	News/Economics	<a href="https://bit.ly/3VhG6SK">https://bit.ly/3VhG6SK</a>
Onda Cero	<i>Does AI endanger the profession of journalist and communicator?</i>	02/29/2024	<i>Nits de radio</i>	<a href="https://bit.ly/4cco1fE">https://bit.ly/4cco1fE</a>
Onda Cero	<i>Diego Martínez: "Our challenge is to ensure that AI is developed ethically and responsibly."</i>	02/14/2024	<i>Más de uno</i>	<a href="https://bit.ly/3yUSuAH">https://bit.ly/3yUSuAH</a>
Onda Cero	<i>Learning to use artificial intelligence as another tool in a journalist's arsenal</i>	07/31/2023	<i>Más de uno</i>	<a href="https://bit.ly/3xbDcXJ">https://bit.ly/3xbDcXJ</a>
Onda Cero	<i>Artificial Intelligence makes Más de uno</i>	03/02/2023	<i>Más de uno</i>	<a href="https://bit.ly/3Xjav5N">https://bit.ly/3Xjav5N</a>
<b>Press Podcast</b>				
<i>El País</i>	<i>How to clone a voice?</i>	11/16/2022	Podcast. <i>Hoy en El País</i>	<a href="https://bit.ly/3VvwZiO">https://bit.ly/3VvwZiO</a>
<b>Podcast of educational/academic entities</b>				
Onda Universitaria	<i>Newsletter with AI neural voices</i>	01/03/2024	<i>Francisco de Vitoria University</i>	<a href="https://bit.ly/3RkziCJ">https://bit.ly/3RkziCJ</a>