# Computational journalism and ethics: An analysis of deontological codes of Latin American

## *Periodismo computacional y ética: Análisis de los códigos deontológicos de América Latina*

## *Jornalismo computacional e ética: Análise dos códigos de ética da América Latina*

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## Abstract

*The so-called computational journalism is becoming increasingly important among media. Its emergence has given rise to numerous ethical dilemmas. The main goal of this research is to determine if the content of deontological codes is still a valid reference for professionals. More specifically, this research focuses on Latin America. A content analysis was the methodology applied to a selection of 18 ethical codes. Data were coded according to Dörr and Hollnbuchner (2017). Results show a great presence of principles such as respect for privacy, observation of legal status, objectivity or the authorship of data and results. On the contrary, we have not found any references to controlling software and techniques in any code. We concluded that the antiquity of the code is not a relevant factor, except for the Code of Ethics for Journalists and Communication Professionals of El Salvador.*

**Key Words:** *Computational journalism; Communication ethics; Deontological codes; Privacy; Data analysis; Latin America*

## Resumen

*El denominado periodismo computacional está adquiriendo una importancia cada vez mayor en los medios de comunicación. Su irrupción supone la aparición de numerosos dilemas éticos. El objetivo principal de esta investigación es determinar si el contenido de los códigos deontológicos de la profesión sirve como referencia válida. En concreto, el análisis se centra en América Latina. Se realiza un análisis de contenido de 18 códigos. Para ello se sigue una ficha metodológica creada a partir del trabajo de Dörr y Hollnbuchner (2017). Los resultados muestran una gran presencia de principios como el respecto por la privacidad, la adecuación a las normas legales, la objetividad o la autoría de los datos y los resultados. Por el contrario, un principio muy importante en el periodismo computacional como es el control y comprobación del software y de las técnicas empleadas no aparece reflejado en ninguno de los códigos. Se concluye que la antigüedad del código no es un factor determinante, salvo en algún caso como El Salvador.*

**Palabras clave:** *Periodismo computacional; Ética de la comunicación; Códigos deontológicos; Privacidad; Análisis de datos; América Latina*

## *Resumo*

*O chamado jornalismo computacional está se tornando cada vez mais importante na mídia. Sua irrupção deu origem a numerosos dilemas éticos. O principal objetivo desta pesquisa é determinar se o conteúdo dos códigos deontológicos serve como uma referência válida para os profissionais. Especificamente, a análise se concentra na América Latina. Uma análise de conteúdo de 18 códigos é realizada. Para isso, segue-se um arquivo metodológico criado a partir do trabalho de Dörr e Hollnbuchner (2017). Os resultados mostram uma grande presença de princípios como respeito à privacidade, conformidade com normas legais, objetividade ou autoria de dados e resultados. Pelo contrário, um princípio muito importante no jornalismo computacional, como o controle e a verificação do software e as técnicas utilizadas, não se reflete em nenhum dos códigos. Conclui-se que a idade do código não é um fator determinante, exceto em alguns casos como El Salvador.*

**Palavras chave:** *Jornalismo computacional; Ética da comunicação, Códigos deontológicos; Privacidade; Análise de dados, América Latina*

# 1. Introduction

Journalism has been no exception to the structural transformation that we have witnessed in recent years in a number of areas. This change is affecting various economic, social, legal and cultural spheres and, among other factors, it is the result of the impact caused by the emergence of information, communication and, in particular, internet technologies in our lives.

One of the examples of how technology is used in journalism and the various stages of the production process (starting with data collection, proceeding to message preparation and then finally ending with the dissemination of that message) is what is known as computational journalism. According to Vállez and Codina (2018), this can be viewed from two perspectives which, despite appearing to be contradictory at first, are actually complementary: the continuist and disruptive perspectives.

Firstly, we can talk about continuism because, in a sense, through the various advances that have occurred, we are witnessing a logical process in which technology, which has always been part of our daily lives and the routines of the media and the professionals who work in it to some degree, has taken a new, significant step forward; however, in truth it is simply another step in its evolution.

However, at the same time, it is perfectly legitimate to talk about disruption, because technology also enables innovation in the methods followed to produce journalistic products, while at the same time suddenly diverging from the process that had previously been the norm, and from several of the most common routines in journalism, up to the point when these technologies appear and, consequently, new categories emerge such as computational journalism.

Another of the most significant features of computational journalism is the fact that it usually relies upon methods that are commonly followed in the field of social sciences to conduct a variety of research projects. Moreover, these methods are normally used to tackle issues which, for one reason or another, are in the public interest (Coddington, 2015).

Similarly, the content generated when employing these techniques is fully personalised or, to put it another way, one of the goals of computational journalism is to automate processes or routines to generate personalised results (Vállez and Codina, 2018).

Furthermore, it should be noted that a variety of names have been used to describe the same thing. All of these concepts are summarised in Table 1, which contains their original name, their name in Spanish and the main authors whose papers have described them:

| Original name | References |
|---|---|
| Algorithm journalism | Anderson (2012)<br>Diakopoulos (2015)<br>Dörr (2016)<br>Dörr & Hollnbuchner (2017)<br>Van Dalen (2012) |
| Augmented journalism | Ferrer Conill (2015)<br>Marconi & Siegman (2017)<br>Pavlik & Bridges (2013) |
| Automated journalism | Carlson (2015;<br>Casswell & Dörr (2018)<br>Graefe (2016)<br>Lindén (2017a)<br>Napoli (2014) |
| Computational journalism | Anderson (2012)<br>Coddington (2015)<br>Cohen<br>Hamilton, Turner (2011) Gynnild (2014)<br>Stavelin (2013) |
| Data journalism;<br>Data-driven journalism | Chaparro Domínguez (2014)<br>Coddington (2015)<br>Lewis & Wetlund (2015)<br>Parasie & Dagiral (2013)<br>Young, Hermida, & Fulda (2018) |
| Robot journalism | Carlson (2015)<br>Clerwall (2014<br>Lindén (2017b)<br>Montal & Reich (2016)<br>Thurman, Dörr & Kunert (2017) |

**Table 1:** Different names for computational journalism.

Computational journalism also poses numerous ethical challenges for professionals. Although traditional ethical principles may serve as a guide for professionals to carry out their work in a responsible manner, these challenges and dilemmas require a realignment and new approach to adapt to the specific characteristics of this new form of journalism and, generally, to be able to conduct oneself in the most appropriate manner in this new digital ecosystem (Díaz -Campo and Segado-Boj, 2014; 2015; García Capilla, 2012; Ruiz, Masip and Micó, 2007; Suárez Villegas, 2015; Ward, 2018; Ward and Wasserman, 2010).

In the same vein, there are several pieces of research that have tried to establish an ethical framework that can serve as a reference for computational journalism, with its various aforementioned names (for example, Bradshaw, 2014; Craig, Ketterer and Yousuf, 2017; Fairfield and Shtein, 2014; Kent, 2015; or Lewis and Westlund, 2015). However, Dörr and Hollnbuchner (2017) have probably taken one of the most rigorous and comprehensive approaches by trying to construct an integrated framework that consists of three different spheres of action associated with the areas of influence, or with a direct or indirect impact on professional journalists in the course of their work:

- Professional sphere
- Organisational sphere
- Social sphere

| Ethical challenges of computational journalism | | |
|---|---|---|
| Collecting the information | Data | Reliability |
| | | Respect for privacy |
| | | Use of appropriate methods |
| | | Possible bias |
| | | Rights and authorship |
| | | Financial implications |
| | The journalist's conduct | Transparency |
| | | Objectivity |
| | | Responsibility |
| | | Accuracy |
| | | Possible bias |
| | | Software authorship and rights |
| | | Methods used |
| Information processing | Checking and verifying the software | |
| | Checking and verifying the methods used | |
| Dissemination of the information | Authorship of the results | |
| | Transparency (revealing the source of the information and methods and systems used) | |
| | Legal compliance | |
| | External monitoring | |

**Table 2:** Ethical challenges of computational journalism

Compiled by author based on Dörr and Hollnbuchner (2017).

However, the most common way for journalists to grant official status to the ethical recommendations that they want to make is self-regulation which, among other things, is notable because it is driven internally, within the profession itself, and voluntarily.

Self-regulation takes the form of a set of mechanisms aimed at implementing those recommendations. These include deontological codes, press councils, style books and the news ombudsman, among others.

However, without question, the most firmly established and widely known of all of these is the deontological code, a document that contains a set of ethical guidelines and criteria. They share the common feature that the people engaged in a profession, in this case journalism, consider them to be essential to perform their work (Díaz-Campo, 2016).

Consequently, analysing the content of those codes is a way of determining whether specialists in computational journalism have specific and suitable guidelines to enable them to conduct their work in an ethical and responsible manner.

This research is focused specifically on Latin America, whose first code of ethics, or document with similar characteristics, was published in Brazil, entitled the São Paulo Declaration, a precursor of others in Argentina, Chile, Cuba, Peru and Venezuela (López-Talavera, 1998).

The development of ethical codes and the self-regulation of journalism in Latin America reached a milestone with the 2nd Congress of the Latin American Federation of Journalists, held in 1979, during which the Latin American Journalism Code of Ethics was approved. This undoubtedly served as a benchmark for the various codes that were approved around this period.

The various research papers whose subject matter is ethical codes of journalism in Latin America have reached the conclusion that these documents contain a set of features and aspects that are specific to this geographical area and which

distinguish them from other countries across the world (Virtue, 1998; López-Talavera, 1998). The same conclusion has been reached by the analyses of codes performed worldwide (for example, Barroso Asenjo, 2011, or Villanueva, 2002).

Additionally, some of these papers, especially some of those published most recently, emphasise the fact that these codes would need to be reviewed and updated to adapt them to the current circumstances (López-Talavera, 1998; Díaz- Campo, 2004; Parra Valcarce, Real Rodríguez and López Talavera, 2017; Díaz del Campo and Chaparro-Domínguez, 2018).

This is also evident in the uneven development of ethical codes of journalism in Latin America during subsequent years and in their current situation. Thus, there are cases where the existing ethical codes date back to the 1970s and 1980s (Honduras, Ecuador and Peru); while in other cases, they have been reviewed and updated from 2010 onwards (Costa Rica, Argentina, El Salvador, Cuba, Uruguay, Venezuela and Chile).

Consequently, the aim of this research is to analyse the deontological codes for Latin American journalism, to determine the extent to which they are fit for purpose for the current reality of computational journalism and the ethical principles that could serve as a benchmark to establish a responsible framework for action for this specialist field of journalism.

Following on from that initial goal, we have set two secondary objectives:

1. To determine the degree to which the date on which a document was approved or last updated affects the extent to which its contents are fit for purpose for the current reality and circumstances of computational journalism.

2. To establish whether all of the ethical principles that could serve as a benchmark for computational journalism can be found consistently across all of the codes examined or if, otherwise, there is an imbalance in the presence of these guidelines.

3. To determine whether Latin American ethical codes are valid, as currently worded and with their current content, to serve as an ethics reference guide for specialists in computational journalism who work in this geographical area

## 2. Material and methods

The methodology used to conduct this research was an analysis of the contents of the documents, in particular the articles, the codes of ethics of the most important professional groups in journalism (associations, schools, trade unions, etc.) in the different countries in Latin America.

To code the data collected in the codes that we have analysed, we selected the seven principles put forward by Dörr and Hollnbuchner (2017) which, firstly, best reflect the reality of computational journalism and, secondly, the contents of the deontological codes of the countries that were studied (Díaz del Campo and Chaparro-Domínguez, 2018). Specifically, they are as follows:

- Suitable data collection methods
- Objectivity
- Respect for privacy
- Confirmation and analysis of the data
- Checking and verifying the software and the methods used
- Authorship of the data and results
- Legal compliance

The codes that were analysed are listed below (in each case specifying the title, country and group or association responsible for drafting them) in chronological order by year of approval or the date on which their contents were last updated. There are 18 documents in total. We limited the analysis to national documents, omitting any with a regional or supranational scope, as we considered them to be different documents whose inclusion may have distorted the results obtained.

- 1979. Honduras: Code of Ethics (Honduran Society of Journalists)
- 1980. Ecuador: Journalists Professional Code of Ethics (National Federation of Journalists)
- 1988. Peru: Code of Ethics (National Association of Journalists from Peru)
- 1991. Bolivia: Code of Ethics (Society of Journalists of Bolivia)
- 1991. Brasil: Code of Ethics and Self Regulation (National Association of Journalists)
- 1994. República Dominicana: Code of Ethics (Dominican Society of Journalists)
- 1996. Mexico: Code of Ethics (National Federation of Mexican Journalists)
- 1999. Paraguay: Code of Ethics (Journalists Union from Paraguay)
- 2000. Guatemala: Code of Ethics (Society of Journalists from Guatemala)
- 2006. Colombia: Code of Ethics (Society of Journalists)
- 2007. Panama: Code of Journalistic Ethics (Society of Journalists)
- 2011. Costa Rica: Code of Ethics for Communication Professionals (Costa Rican Society of Journalists)
- 2012. Argentina: Code of Ethics of Argentinian Press (Society of Argentinian Journalists)
- 2012. El Salvador: Code of Ethics for Journalists and Communication Professionals from El Salvador (Society of Journalists from El Salvador)
- 2013. Cuba: Journalist Code of Ethics (Cuban Journalists Union)
- 2013. Uruguay: Code of Journalistic Ethics (Uruguayan Press Asotiation)
- 2013. Venezuela: Code of Ethics (National Society of Journalists from Venezuela)
- 2015. Chile: Code of Ethics (Chilean Society of Journalists)

As the first step of the analysis, we performed a preliminary test on two of the analysed documents, one that had existed for a greater number of years and another that was more recent, and we verified the suitability of the principles that we had selected as a valid methodological tool to conduct the research. During

the second phase, a single author coded the data obtained from the analysis of all of the documents, gathering and sorting the texts by ethical principles.

# 3. Results

Of the 18 Latin American journalism codes examined, the ones that contained most of the seven principles outlined by Dörr and Hollnbuchner (2017) are those from the Dominican Republic, Colombia and El Salvador, whose documents were approved in 1994, 2006 and 2012, respectively. In all three cases, they directly or indirectly reflect six of the principles in our analysis. Meanwhile, at the opposite end of the scale is Peru, whose code, which was approved in 1988, only covers two of the aforementioned principles, which are further discussed below, grouped into three blocks: Privacy and legal compliance; Objectivity and authorship; and *Methods, data analysis and checking the software*.

## 3.1. Privacy and legal compliance

The principle set out by Dörr and Hollnbuchner (2017) that is covered by the highest number of Latin American codes that were analysed is respect for privacy. It appears in the majority of the 18 documents studied; in 15 of them. It is only absent from the codes in Cuba, Paraguay and Peru.

Countries like Uruguay, Argentina, Panama and Chile briefly cover this principle in a neutral manner, without establishing any exceptions to fulfilling the principle. Thus, for example, article 16 of the journalism code in Uruguay states that "journalists must respect people's privacy" and in Argentina, in article 8, it stipulates that "journalists shall respect individual privacy".

However, the codes from other countries do include exceptions to journalists respecting people's privacy. These exceptions often relate to the public interest. Thus, article 5 of the Venezuelan code states that "journalists may only report on someone's private life when doing so is important for the interests of the community; they are obliged to treat the private life of any Venezuelan citizen with the dignity,

discretion and truthfulness that it merits" and article 12 of the code in El Salvador states that people's privacy must be respected "including public figures, except when their conduct has an impact on the interests of the community and the State".

Similarly, article 7 of Colombia's code states that a journalist "must respect the private lives, dignity and privacy of people and only report on events or circumstances of a private nature when there is a clear public interest to do so". This is somewhat similar to the document in Brazil, which establishes an obligation to respect a person's right to privacy "unless this right hinders the reporting of information that is in the public interest".

The codes for reporters in the Dominican Republic and Bolivia include a different dimension in terms of safeguarding this principle: legal compliance. Thus, article 47 of the former indicates that a journalist may pry into a person's private life "in cases where a public offence has been committed", while article 4 of the latter states that "journalists are obliged to safeguard every individual's right to privacy and to a private personal and family life, unless they break the laws by which the country is governed".

Such compliance with the provisions of the law is another of the principles outlined by Dörr and Hollnbuchner (2017) that is most frequently found in the codes that we analysed. It appears in the majority of them; in 14 of the 18 documents studied. It is only absent from the texts from Mexico, Panama, Paraguay and Venezuela.

Respect for democratic values is one of the key principles of the codes in Chile, Argentina, El Salvador, Colombia, Guatemala and Brazil. For example, article 1 of the Argentinian code indicates that "journalistic work shall be guided by respect for people, the constitutional principles and the democratic values and institutions". Something similar appears in article 2 of the document from El Salvador, which states that: "Journalism and communication professionals shall respect the democratic values, which include: peace and solidarity among peoples, the culture of tolerance, cultural and social identity, justice, human dignity, private life and privacy".

In other codes, such as the documents from Costa Rica, the Dominican Republic and Bolivia, respect for human rights is more important. Article 1 of the former states that: "[All members are obliged] to abide by this Code of Ethics, respect international treaties and other instruments adopted by the State in relation to human rights, the political constitution, the law under which the Costa Rica Association of Journalists was established and the national laws".

In turn, article 4 of the code in the Dominican Republic states that "journalists shall respect all by-laws regarding communication and information, enshrined in the Universal Declaration of Human Rights, the Republic's Constitution and other legal regulations", while article 1 of the code in Bolivia indicates that: "Journalists shall always serve the truth, justice, the common good, human rights and the ideals of human betterment and peace among men".

## 3.2. Objectivity and authorship

Journalistic objectivity is one of the other principles that appears most frequently in the 18 codes that we analysed, being found in a total of 13. However, it does not appear in the documents from Argentina, Bolivia, Costa Rica, Cuba and Uruguay. It appears directly, i.e. using the word "objectivity", in the codes from Chile, Panama, Colombia, Guatemala, the Dominican Republic, Brazil, Peru and Ecuador. For example, in the case of Panama, articles 2 and 4 indicate that: "In my role as a journalist, I shall report with objectivity, impartiality, honesty and accuracy. I shall not serve any political, ideological, religious or economic interests or allow my beliefs to compromise the objectivity of the information". The code from Ecuador is in a very similar vein to this, with article 1 stipulating that "a journalist is obliged to provide the community with objective, accurate and timely information".

However, in other countries, objectivity appears indirectly and not explicitly, with their journalism codes reflecting similar values such as honesty, impartiality and truthfulness. This is the case of the documents from Venezuela, El Salvador, Paraguay, Mexico and Honduras. For example, in the latter case, article 2 indicates that members of the journalists' association must "report accurately, impartially and truthfully, without omitting anything that the public has the right to know".

Article one of the Mexican code states that one of the chief responsibilities of a journalist is to "provide truthful, complete, diverse and timely information".

Authorship of the data and results is another of the principles put forward by Dörr and Hollnbuchner (2017) that is present in most of the codes that we examined, as it is in 12 of the 18 Latin American documents. It does not appear in the cases of Argentina, Brazil, Chile, Guatemala, Honduras or Peru. In some cases, this principle relates to the concept of plagiarism, which is considered a bad practice that is to be avoided in the documents from Cuba, Uruguay, Panama, Colombia, Mexico and Bolivia. For example, article 21 of the Cuban code states that "a journalist is guilty of plagiarism if they claim as their own any journalistic work which, in whole or in part, they have taken from other colleagues or authors in any type of news media". In turn, article 8 of Panama's code states that plagiarism is considered to be "unethical behaviour".

In other cases, this principle of journalistic authorship relates to the journalist's actual involvement in producing the published media product, as in the case of the codes from Venezuela and Ecuador. For example, article 32 of the latter states that: "A journalist is forbidden from using informative material as their own if they have not been involved in preparing it; do not attach your name to publications or programmes in which you have had no actual involvement".

In other cases, the concept of authorship relates to copyright. This is the case for the documents from Costa Rica, Paraguay and the Dominican Republic. Thus, article 5 of Panama's code establishes that a journalist "shall respect the copyright of other journalists and authors in public communication. They shall cite the names of the authors of any materials that they may use".

El Salvador is a special case in point, as it is the only one of the 18 codes analysed to mention intellectual property in relation to the Internet. Thus, in article 31 it stipulates that journalists from that country must "respect and acknowledge the intellectual authorship of the information that is published when it is obtained through the Internet and other sources of information".

### 3.3. Methods, data analysis and checking the software

Half of the 18 codes analysed (from Argentina, Bolivia, Chile, Colombia, El Salvador, Panama, Paraguay, the Dominican Republic and Uruguay) include the principle that appropriate data collection methods must be used. The most commonly used adjectives to describe the methodology that journalists must use in their daily activity are "honest" (as is the case of the codes from Uruguay, Bolivia and the Dominican Republic), "lawful" (the deontological codes from Panama and Paraguay) and "ethical" (the codes from Panama and Colombia).

This principle appears briefly in most of the codes, with the exception of Uruguay, with article 14 of its document specifying the methods that reporters should never use to obtain information: "Journalists should use honest methods to obtain information and, therefore, they shall abstain from impersonating another person, secretly recording telephone calls, using hidden cameras and microphones and bribing witnesses".

Furthermore, only article 31 of El Salvador's document refers to "data", not simply information, documentation, photographs and/or images, as is the case in all other texts that we studied. The specific wording of this principle is as follows: "Use appropriate methods to obtain information, data or images, without resort ing to unlawful methods".

Another of the principles put forward by Dörr and Hollnbuchner (2017) is confirmation and analysis of data. As in the previous point, this appears in half of the codes that we analysed, albeit not in the same cases. Thus, the documents that refer to this principle are from Argentina, Colombia, Costa Rica, Cuba, Ecuador, El Salvador, the Dominican Republic, Uruguay and Venezuela.

In this case, three of the analysed codes refer to the online environment when verifying the information obtained by journalists. Article 5 of the Cuban code establishes that: "In the media environments that have emerged with the development of information and communications technologies, with greater opportunities to generate content, journalists must strengthen their ethical conduct

and professional responsibility when creating, selecting and broadcasting the increasing flows of interactive information on the Internet".

In turn, article 4 of Argentina's code specifies that "information that originates from data provided by readers or users shall be subject to the same verification principles", while article 31 of El Salvador's document states that journalists must "support the information with reliable data or sources which substantiate or verify their claims [...]. In the case of information obtained from the Internet, the legitimacy of the origin of the website must be verified".

With regard to the other codes analysed that include this principle, a number of them focus on "verifying" the information by using reliable "sources" which offer guarantees while also being suitable (as is the case with the codes from Chile, Venezuela, the Dominican Republic and Ecuador).

Finally, the principle of checking and verifying the software and the methods used, as set out by Dörr and Hollnbuchner (2017), does not appear in any of the 18 codes that we analysed, directly or indirectly.

As a final summary of this section, table 3 summarises the ethical principles that are included in each of the analysed codes, in descending order of the number of times that they appear.

| **Presence of ethical principles in the analysed codes** | |
|---|---|
| **Principle** | **Number of codes in which it appears** |
| Respect for privacy | 15 |
| Legal compliance | 14 |
| Objectivity | 13 |
| Authorship of the data and results | 12 |
| Confirmation and analysis of the data | 9 |
| Suitable data collection methods | 9 |
| Checking and verifying the software and the methods used | 0 |

***Table 3:*** *Presence of ethical principles in the analysed codes Compiled by author.*

# 4. Discussion and conclusions

The first conclusion that can be drawn from the data obtained is that the age of the code or the last time that it was updated is not a determining factor, which is confirmed by the fact that the three codes that contain the highest number of principles, from the Dominican Republic, Colombia and El Salvador, were approved on very different dates, 1994, 2006 and 2012 respectively.

The one exception to this trend would be El Salvador's code, one of the most recently updated, specifically in 2012, in which we did indeed find references that were more specific or better adapted to computational journalism. Thus, for example, this code links traditional concepts such as intellectual prop erty and the reliability of sources to specific references to the Internet. Similarly, this same document refers to data and the processing thereof in a more modern context.

Moreover, the presence of the principles is very uneven, as we found four of them that were included in the majority of the various codes (respect for privacy, legal compliance, objectivity and authorship of data and results), another two that are present in half of them (confirmation and analysis of the data and suitable data collection methods) and one of them that does not appear in any of the codes (checking and verifying the software and the methods used).

Consequently, although most of the foregoing analyses relating to this geographical area (López-Talavera, 1998; Díaz-Campo, 2004; Parra Valcarce, Real Rodríguez and López Talavera, 2017; Díaz del Campo and Chaparro -Domínguez, 2018) would suggest that the codes should be reviewed and updated; it appears that such reviews should be qualitative rather than quantitative, i.e. they should affect how the different principles are worded rather than whether those principles should be present or absent.

This is also confirmed by the fact that the term "data", which is one of the words most closely associated with the characteristics of computational journalism, is only specifically referred to in one of the codes that we analysed.

In turn, this would also confirm that, as noted by various authors (for example, (Díaz-Campo and Segado-Boj, 2014; 2015; García Capilla, 2012; Ruiz, Masip and Micó, 2007; Suárez Villegas, 2015 and Ward, 2018), generally, the traditional ethical principles of journalism continue to apply to the new categories and specialist fields, but they need to be reworded to adapt them to their more specific circumstances in each case.

Furthermore, one of the limitations of this research is that it focuses on deontological codes and it does not include other self-regulating mechanisms such as press councils and their decisions or the work done by the news ombudsman in the different forms of media where such a role exists.

Finally, the results obtained open up the possibility of other similar papers being written, for example, relating to other geographical areas. They also pave the way for internal media documents or specific guidelines and recommendations being published or others from other groups of journalists or which are in some way related to journalism.

It would also be possible to replicate this analysis in a few years, firstly, to determine whether there is a higher number of codes containing deontological principles that are applicable to computational journalism and, secondly, to ascertain whether any updates and reviews that these codes have undergone have served to adapt their wording to the characteristics of computational journalism or if, to the contrary, little notable progress has been made in this regard.

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