The use of notifications from mobile applications in the Spanish media

La utilización de las notificaciones de las aplicaciones móviles en los medios de comunicación españoles

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ABSTRACT
Introduction: Mobile phones have become one more communication channel for the media in recent years. This research analyzes how Spanish radio, press, and television use notifications to send journalistic content to users of their mobile applications. **Methodology**: a quantitative content analysis of 1,226 notifications received in the mobile applications of the nine main Spanish media that have a mobile app has been carried out: *SER, COPE, Onda Cero, Radio Nacional de España, El País, El Mundo, ABC, La Vanguardia*, and *RTVE*. **Results**: the study reveals that the Spanish media send notifications, fundamentally, with an informative purpose and narration of live events, and that they do so, especially, to address matters related to sports, national politics, and, currently, the health, economic and social crisis caused by COVID-19. The research shows notable differences between the strategies of the different media studied and reveals a low use of graphic elements in mobile notifications, as well as in advertising. **Conclusions and discussion**: informative alerts are systematized in the media, although they still present operational problems in some cases and a certain homogeneity in formats and contents. There is a notable margin of use, for example, in the case of advertising as an element of monetization of the apps themselves.

KEYWORDS: journalism; mass media; mobile journalism; mobile applications; content analysis.

RESUMEN
Introducción: Los teléfonos móviles se han convertido en un canal de comunicación más para los medios de comunicación en los últimos años. Esta investigación analiza cómo la radio, la prensa y la televisión española emplean las notificaciones para enviar contenido periodístico a los usuarios de sus aplicaciones móviles. **Metodología:** se ha realizado un análisis de contenido cuantitativo de

1.226 notificaciones recibidas en las aplicaciones móviles de los nueve principales medios españoles que disponen de *app* móvil: *SER, COPE, Onda Cero, Radio Nacional de España, El País, El Mundo, ABC, La Vanguardia* y *RTVE*. **Resultados:** el estudio revela que los medios españoles remiten notificaciones, fundamentalmente, con un propósito informativo y de narración de eventos en directo, y que lo hacen, especialmente, para abordar asuntos relacionados con el deporte, la política nacional y, en la actualidad, la crisis sanitaria, económica y social provocada por la COVID-19. La investigación muestra diferencias notables entre las estrategias de los distintos medios de comunicación estudiados y pone de manifiesto una escasa utilización de los elementos gráficos en las notificaciones móviles, así como de la publicidad. **Conclusiones y discusión:** las alertas informativas están sistematizadas en los medios de comunicación, si bien todavía presentan problemas de funcionamiento en algunos casos y una cierta homogeneidad en formatos y contenidos. Existe un notable margen de aprovechamiento, por ejemplo, en el caso de la publicidad como elemento de monetización de las propias *apps*.

PALABRAS CLAVE: periodismo; periodismo móvil; medios de comunicación; aplicaciones móviles; análisis de contenido.

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Translation by **Paula González** (Universidad Católica Andrés Bello, Venezuela)

1. Introduction

Across the globe, there are currently 5.22 billion unique mobile phone users, a figure that is increasing year after year, to the point that there are now more mobile devices connected to the Internet than there are inhabitants on Earth. These are data from the *Digital 2021: Global Overview Repo*rt, which adds: Internet users, on average, spend almost seven hours connected to the Internet, around four hours using the mobile phone, and just over two hours reading the content published by the media, both online and in print (Kemp, 2021). If we take into account that the consumption of paper press is falling, as well as the consumption of radio media (AIMC, 2020), it is clear to conclude that it is increasingly important for the media to achieve a prominent position in the dissemination of journalistic content on the Internet.

It should be noted, in this sense, that mobile phone applications concentrate 92% of the time that users spend using their terminals. In 2020, more than 218 billion mobile phone applications were downloaded, 7% more than the previous year, and applications related to the media were established in the sixth place of the most downloaded (APP Annie, 2021).

As Olivero (2017) collects, the first application - hereinafter app - for mobile terminals reached the market around 15 years ago. And four years ago, this author adds, we dedicated 80% of the time of use of our mobiles to the use of apps, Spain being one of the countries at the fore in terms of the hegemony of apps over, for example, Internet browsers.

The trend reflected by reports such as Ditrendia is that, moreover, we are not only consuming more mobile applications, but we are spending -or investing- more on apps: "Users are expected to spend 30% more on world-class applications […], exceeding 110 billion dollars globally" (Rivero, 2018, p. 51). Also, according to Newman et al., "The smartphone continues to grow in importance for the

news, with two-thirds (66%) now using the device to access news each week" (2019, p. 10). And these authors exemplify the case of the United Kingdom:

> About four in ten (43%) [citizens] in the UK say they go to a news website or app first when using a smartphone, a relatively high figure almost certainly driven by the popularity of the news from the BBC app. […] The first general contact through social networks has fallen six points, while the use of aggregators (11%) and alerts/notifications has grown (10%) (2019, p. 15).

2. State of the question

2.1. Mobile devices, applications, and media

The smartphone, Márquez defends, "can be considered as a new type of meta-medium, that is, a platform that houses many existing and new media, which includes most of the technologies and techniques of existing media, as well as the invention of new ones" (2017, p. 61). It is, in fact, and according to this author, the true meta-medium (Manovich, 2013) of the 21st century, if we assume that the computer was the meta-medium of the 20th century (2017). As Gil and Gómez de Travesedo (2018) collect, authors such as Kerckhove (2005) refer to the mobile phone as the third screen, others, it is the case of Miller (2014), as the fourth, and there are those, among others Gardner and Davis (2014), who go further and define it as the first screen.

The development of technology, in general, and of mobile phones, in particular, has had an impact on all areas of life, including journalism, to the point of causing the birth of the concept of "mobile journalism". Parra defines it as:

> The treatment of journalistic information that allows the online sending and reception of texts, static images [...], dynamics, and sounds in an integrated way, as well as the participation of citizens, turned into generators and evaluators of content, all using the technological possibilities of the third generation of mobile phones (2008, p. 1).

The emergence of these new channels through which to produce and communicate journalistic information does not necessarily imply the disappearance of previous ones, but rather, in line with Cobos, one and the other can be complementary: "Mobile platforms represent a new technology change in the press industry, thereby gaining space as one more support for the distribution of news information, thus reorganizing the existing ecosystem in this regard" (2012, p. 87). The pairing of mobile devices-media has aroused the interest of the academy, especially since 2013, and, between 2008 and 2018, it resulted in the publication of 199 articles in the Web of Science database (López-García et al., 2019).

Among the advantages that mobile phones provide as communication channels, Martínez (2014) highlights the connection between media and users, while Aguado and Navarro (2013) highlight the multiplicity of possibilities for content and the user. For his part, García (2013) highlights the advantages that they also imply for media professionals when preparing their journalistic content.

Cobos summarizes the evolution of the content of the written media on mobile phones in four main phases: that of alerts through text messages (SMS), the transition from WAP portals to mobile portals, the appearance of apps, and the edition for digital reading devices or e-readers (2012, pp. 88-89). The arrival of mobile applications implies, as Robledo-Dioses recalls, that content is managed "as a service, an experience that adjusts to the changing needs of users" (2017, p. 17).

Mobile apps are "a specific type of software that is installed on next-generation mobile devices such as smartphones and tablets, and allows executing different tasks focused directly on direct interaction with the user" (Pulgar and Maniega, 2012, p. 130). Currently, as Ramos del Cano and González-Molina state, studies on mobile apps created by the media are summarized in five approaches: design, interactivity, presence of multimedia resources, business models, and adaptation of content to the mobile environment (2015, p. 45).

In this sense, recent studies such as that of Gómez-García et al. (2019) delve into the context in which these apps are located and their influence from the point of view of those who develop them. Focusing their research on the apps about the political discourse around the president of the United States Donald Trump, they detect almost a hundred (88) applications with more than 10,000 downloads and find out that the purposes of the developers are both economic and ideological.

Although it is not one of the purposes of the research to describe the characteristic features of design, presentation, and adaptation of content in apps, we do consider it pertinent to summarize them. Larrondo and Teixeira, who influence the limited scientific production in this regard, synthesize these features in six keys:
1. Simple, clear, and intuitive interface.
2. Good design and aesthetics.
3. Use of layers of depth or hypertext levels of access to information.
4. Exploit the medium's distinctive tactile capabilities.
5. Wide use of different media codes or formats, especially video, avoiding redundancies or duplications, that is, that two types of content in different media say the same (for example, in text and video).
6. Multimedia integration because it provides the story in a more natural way than the mere juxtaposition of content in different media formats (Larrondo and Teixeira, 2016, pp. 781-782).

Likewise, Canavilhas and Cavallari summarize the features of these journalistic content on mobile devices in six items: accessibility, instantaneity, multimedia, hypertextuality, interactivity, and globality (2011, p. 55). Lastly, and although it also escapes the object of this study, we will highlight the studies by Costa-Sánchez (2014) and Nel and Westlund (2011) regarding user interaction and participation.

2.2. Push notifications

One of these features, instantaneity, is closely related to the appearance of mobile notifications, the object of this research and also known as mobile alerts, push notifications, or push messages (Ling et al., 2020). Understanding that all referrals are synonymous concepts, we highlight that, according to authors such as Wheatley and Ferrer-Conill, what is relevant about these notifications is that they communicate the media with their audiences in a news distribution that stands out for three aspects:

> It bypasses social networks and news aggregators, directly reaching the readers; it alters the agency and the control of the temporary personalization of the news; and reinforces the mobile as the place of contact between news organizations and audiences (2020, p. 1).

This idea is related to the thesis of Duffy et al. (2020) that mobile notifications are especially interesting because they allow providing information with greater flexibility where and when they access the news.

But, returning to the aforementioned study by Wheatley and Ferrer-Conill (2020) on the temporality of automatic notifications in several European countries, these authors conclude that the media use the mobile phone not only to attract new users but also to maintain the attention of existing ones. This is one of the few relevant studies on push notifications that have been carried out. Previously, Fidalgo (2009) addressed the issue in the case of the Portuguese media, although he drew a useful conclusion for all regardless of their geographical origin: one of the keys to the success of these notifications lies in the fact that the media know how many, what type, and how often people want to receive alerts.

Another interesting work is that of Brown (2018), who, in two comparative studies in 2017 and 2018, addresses the American model. And he concludes that from one year to another it is observed that the media send more alerts, with more information, and, ultimately, that they evolve towards a better job.

2.3. Characterization of the notification service in the apps of the studied media

The research focuses on the notifications of the mobile apps of *Cadena SER, COPE, Onda Cero, Radio Nacional de España, El País, El Mundo, ABC, La Vanguardia*, and *Radio Televisión Española*. Obviously, all apps have different functionalities such as live broadcasting in the case of radios and televisions, the publication of written journalistic content, in any case, information about programs, authors, or sections, etc. Some of these differences are closely related to the different nature of the press, radio, and television. However, at this point, we will focus on what concerns the research: the notifications.

As a general idea, it should be noted that these are app models, and, therefore, notification models, different from each other and with the particularities that are set out below. The common note is that all of them offer the possibility of customizing these notifications through the configuration menu of the app with a single exception, the *ABC* newspaper, which requires the enabling of notifications through the configuration settings of the mobile phone.

The *RTVE, ABC, El Mundo, RNE, COPE,* and *Onda Cero* apps do not offer any customization options for notifications beyond activating or deactivating them.

The *Cadena SER* app allows you to activate or deactivate notifications, differentiating them into three main categories: Breaking news, *Te lo cuenta la SER*, and Sports. Similarly, *La Vanguardia* also allows you to customize the activation of their notifications by authors and by the categories Breaking news, Sports, *La Contra*, and *Selección Vanguardia*.

In the case of *El País*, the app allows the user to silence notifications at the time they determine and specifically activate or deactivate three types of notifications: breaking news alerts, keys for the day, and notices and sports. Likewise, the user is offered to follow topics or authors.

Thus, as will be seen in the methodology section, activating all notifications without distinction prevents differences that may affect the results. In the same way, the impossibility in the nine apps to activate or deactivate the advertising linked to the notifications also prevents any bias in the results.

3. Objectives

The general objective of the research is to know how the main written press, radio, and television media use the notifications related to each of their apps for mobile phones, a field as little studied in its practical application from the academy (Westlund, 2015) as necessary to study (Varona et al.,

2017). This main objective stated above is specified in other more specific ones, which are the following:

O1. Determine what use the Spanish media make from a quantitative point of view: observe how many notifications they send and at what times of the day they do so.

O2. Check whether, from a technical point of view, notifications -and, also, mobile apps- work correctly, individually, and with what speed to respond to current issues, compared to apps from other media.

O3. Know what are the topics on which the notifications are focused and through which journalistic genres the information sent to users is constructed.

O4. Establish whether the media take advantage of these tools to insert advertising.

4. Methodology

To achieve these objectives, a quantitative content analysis of all the notifications received has been carried out. As pointed out by different authors (Berelson, 1952; Wimmer and Dominick, 1996), this technique allows an objective and systematic description of the studied phenomenon. Furthermore, the decision that the content analysis should be quantitative -and not qualitative- is because, as collected by Sola, an indispensable criterion of all research is that it must be "feasible" (2020, p. 211). And, following Krippendorff (2004), this technique allows working with large volumes of information.

During the research, a Xiaomi Redmi 7 mobile terminal was used. The choice is because it has an Android operating system, which is currently the one with the greatest presence in the market. In fact, according to the IDC consultancy, specialized in technology, Android devices represented more than 86% in 2019 compared to 14% of iOS operating systems, linked to Apple (Mena, 2020).

After selecting the mobile terminal with which the research would be carried out, the mobile apps of *Cadena SER, COPE, Onda Cero, Radio Nacional de España, El País, El Mundo, ABC, La Vanguardia,* and *Radio Televisión Española* were downloaded. The decision to study these media is justified in that the first four are the four most listened to radio stations in Spain (EGM, 2021); and the next, the four most read newspapers in Spain (EGM, 2021). Regarding television channels, in a first approach to the research, it was already detected that it was impossible to analyze them with a procedure similar to that of newspapers and radio stations for one main reason: the lack of information apps from the television media. Therefore, it was decided to study the only one that shared this same line of being an informative app, which turned out to be *RTVE*. The rest of the main networks -*Antena 3, Cuatro, Telecinco*, and *La Sexta*- do not have an app with informative content, but rather work as platforms for on-demand and live content.

Once the apps were downloaded, the reception of alerts and/or notifications was enabled in all of them, and each one of the permissions required to receive content was authorized.

This procedure for downloading the apps and authorizing permits was also carried out on a Huawei P40 Lite terminal to verify that, indeed, the notifications were arriving properly and that the reference terminal for the research received them correctly. And it was found that, indeed, the receipt of notifications was identical in both terminals, so we continued with the research with the mobile initially discussed. This phase also served to carry out an always necessary pretest (Victoria, 2002) that allowed us to verify that the developed analysis code, which is exposed below, allowed us to respond to the objectives that the research was set to achieve.

All the notifications received between January 1st and 14th, 2021 and April 2nd and 15th, 2021 were studied, regardless of the time of receipt, whether or not they were working properly, or any other parameter to understand that any aspect, including the malfunction of notifications, would provide us with relevant information for the study. The selection of the dates was determined according to random sampling, but with the premise that they were two periods of two weeks so that, in the event of a news event that required journalistic coverage for several days, the study would detect it. Likewise, we found that the two periods were circumscribed in moments of notable informative interest -the evolution of the pandemic in the world, assault on the United States Capitol, sports competitions, impact in Spain of a storm with historical consequences, etc.-.

Table 1. *Analysis code*

Fecha de recepción de la notificación	The corresponding one in the analyzed periods (January 1st-14th, 2021 and April 2nd-15th, 2021).
Issuing media	1. *SER* 2. *COPE* 3. *Onda Cero* 4. *Radio Nacional de España (RNE)* 5. *El País* 6. *El Mundo* 7. *ABC* 8. *La Vanguardia* 9. *Radio Televisión Española (RTVE)*
Time of receipt of the notification	1. Between 00:00h and 05:59h 2. Between 06:00h and 11:59h 3. Between 12:00h and 17:59h 4. Between 18:00h and 23:59h
The general topic of the notification	1. Political or National 2. International 3. Sport 4. Events and Courts 5. Time 6. Economy and Employment 7. Society 8. Culture 9. Coronavirus 10. Sexist violence 11. Lotteries and games 12. Others 13. Several of the above
Does the notification work correctly when I click to view it?	1. Yes 2. No
Where does the notification link go?	1. To the mobile app 2. To the website of the media 3. To the mobile app, but indicating that the content has to be seen on the website.
Does the notification include any images in the preview?	1. Yes 2. No
Is the notification a subject of the media that sends it?	1. Yes 2. No
If the answer to the previous question is "no", in what order compared to other media is the notification received?	1. First 2. Second 3. Third 4. Fourth 5. Fifth or later
With what journalistic genre does the publication of the notification identify?	1. News and Chronicle 2. Report

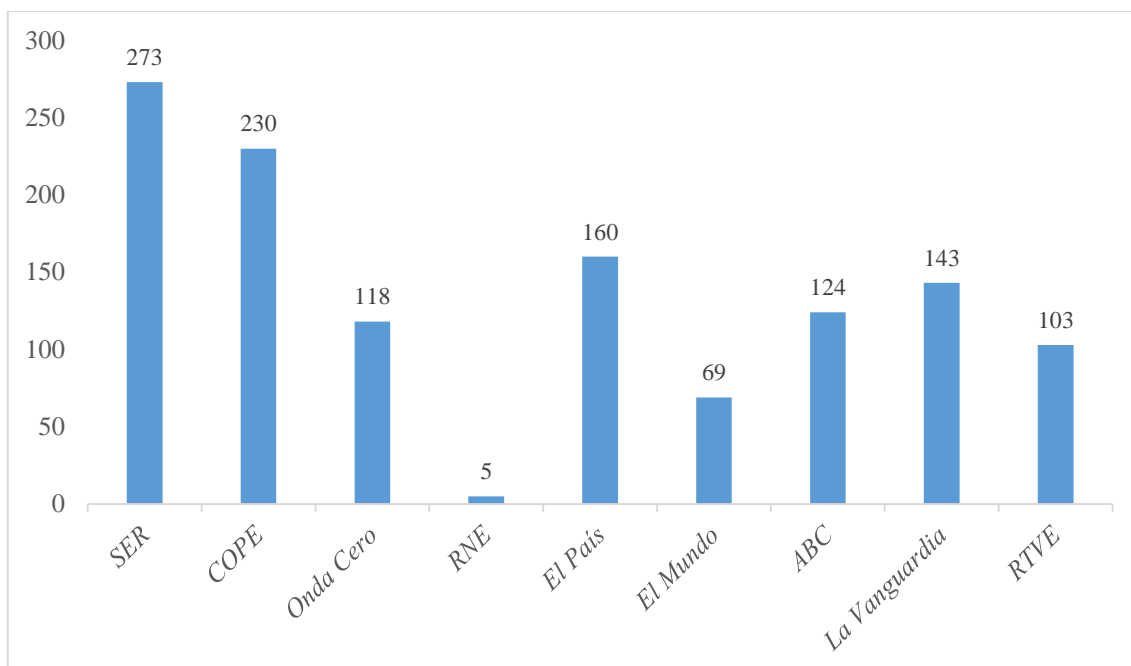| | 3. Interview |
	4. Opinion
	5. Podcast
	6. Live
	7. Others
	8. Several of the above
Does an advertising window open when clicking on the notification before taking us to journalistic content?	1. Yes
	2. No

Source: Self-made

The analysis code used in the study is made up of eleven categories that focus on both formal aspects and content aspects, elaborated according to criteria of homogeneity, relevance, clarity, and productivity (Sánchez Aranda, 2005, pp. 219-220). The formal categories refer to aspects such as the date and time of receipt of the notification, the media that issues it, its correct operation, or the destination to which the notification directs when clicking on it. On the other hand, the content categories allow us to analyze the general topic of the received notifications, the journalistic genres and/or communication mechanisms through which they are articulated, the inclusion or not of images and/or advertising, etc. All categories are included in the analysis code presented below.

5. Results

From the study of the data obtained in the research, it can be seen that not all the media are making equal or similar use of the notification tool. In fact, Graph 1 shows that it is the two leading generalist radio stations in Spain that make the greatest use of notifications: *Cadena SER* and *COPE* concentrate, with 273 and 230, 22.29% and 18, 78% of the total alerts received, respectively. And it is striking that the figures of both, added to those of another radio station, *Onda Cero* (9.63%, that is, 118 notifications) represent more than half of the total notifications, exceeding the sum of all newspapers and the two public radio-television apps studied.

Regarding newspapers, we find a relatively similar strategy: *El País*'s notifications account for 13.06% of the total (160 notifications); those of *La Vanguardia*, 11.67% (143); those of *ABC*, 10.12% (124); and those of *El Mundo*, 5.63% (69). Lastly, it is surprising how little the *RNE* app is used to send alerts (5 notifications, that is, 0.41% of the total). And, taking this last fact into account, the percentage of alerts sent through the *RTVE* app does not seem high either: 8.41% of the total (103 notifications).
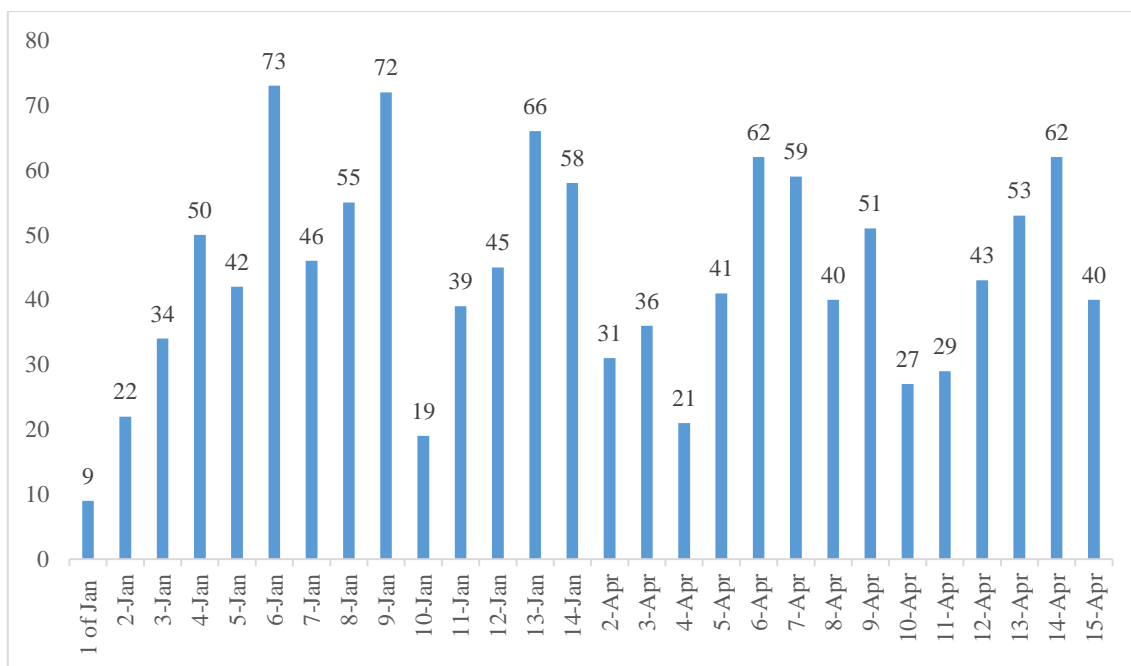
Graph 1: *Distribution of mobile notifications by the media outlet*
Source: Self-made

5.1.   Formal aspects of the coverage

The notifications issued by the media do not generally follow a defined pattern, but their greater or lesser presence is linked to the different news events that occur every day. This, as will be seen later, is closely related to the types of publications that the media send in their notifications and the journalistic genres through which they are presented.

Thus, as can be seen in Graph 2, the days that most notifications were received were Wednesday, January 6th, Saturday, January 9th, and Wednesday, January 13th; These three dates concentrate, respectively, 5.96%, 5.88%, and 5.39% of the notifications. And they do it because on each of those days an especially relevant news event happened: on January 6th, the taking of the Capitol in Washington; on January 9th, the most severe consequences of the storm Filomena in Spain; on January 13th, the indictment of the United States House of Representatives of the second impeachment against Donald Trump.

It is observed, with few exceptions, a common feature to the different analyzed periods: Sundays and holidays, are when the media apps send the least notifications. This is evident on Friday, January 1st - New Year's Day-, and on Sundays, January 10th and April 4th, days in which only 0.73%, 1.55%, and 1.71% of the total notifications were received.

Graph 2: *Number of notifications received according to the day of receipt*
Source: Self-made

The research does allow detecting a clear trend regarding the hours with which notifications are issued. These increase as the day progresses: the time slot that goes from 00:00 hours to 05:59 hours, barely represents 0.98% of the total notifications received; the period between 06:00 hours and 11:59 hours, 25.06%; the following period, between 12:00 hours and 17:59 hours, 31.59%; and, finally, the evening-night interval, which runs from 6:00 p.m. to 11:59 p.m. concentrates 42.20% of notifications.

This phenomenon is produced by two issues that will be discussed later: notifications that summarize the current news of the day and, especially, notifications about sporting events that are taking place in real-time in that time slot. And it is repeated both in the set of media and in each one separately. If anything, we find a small exception: *El País* sends more notifications in the morning time slot than in the afternoon and evening hours. And *RNE* concentrates almost all its notifications (80%) between 12:00 and 18:00, although, as you will see, it hardly issues them.

Regarding the correct functioning of the notifications, and although the data, overall, is that 83.35% of the notifications received did work correctly, it is necessary to specify that percentage by disaggregating it. The data of adequate functioning are above 98% in the cases of *SER, COPE, RNE, El País, El Mundo,* and *La Vanguardia*, and very close to this percentage in *RTVE* (93.20%). However, they are very low in two media outlets: only 24.58% of *Onda Cero* notifications opened correctly when clicking on them; and the percentage is even lower in the case of *ABC* (21.77%). Obviously, it is of little use to send alerts immediately and with interesting content, if they do not work.

From a formal point of view, it is also noteworthy that there is a majority of notifications (50.34%) that direct not to the app, but a web link, and that 0.68% of notifications, when opened, lead to the app, but there a message appears stating that the content has to be viewed on the website. On the contrary, 48.98% of the alerts are directed to the app and the content can be seen without problem in it.

Again, we find important differences between media outlets. We are almost always directed to view the content in the app itself by clicking on the notifications from *RNE* (100%), *El País* (94.34%), *El Mundo* (94.12%), *RTVE* (98.97%), and *La Vanguardia* (98.59%). We understand this as a positive aspect of the operation of the applications that, however, is not repeated in the rest of the media outlets. In fact, the opposite occurs in the cases of *ABC, COPE, Cadena SER,* and *Onda Cero*, which, respectively, send to a web link in 100%, 93.86%, 92.51%, and 51.61% of the occasions.

5.2. The content of mobile app notifications
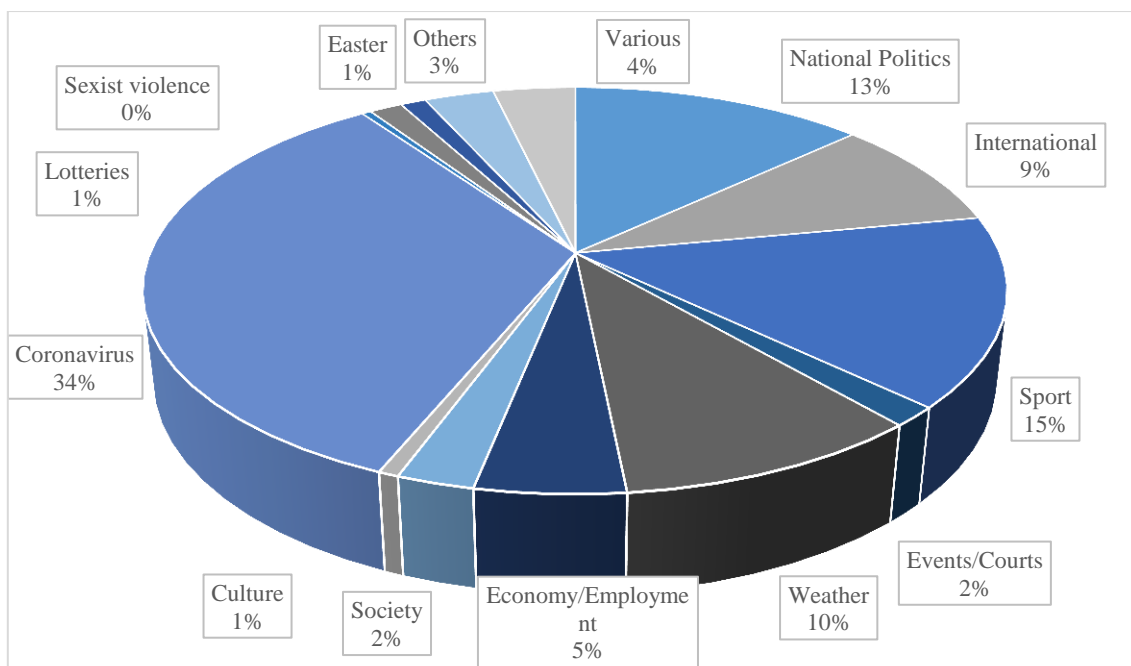
5.2.1. Topic of notifications

Regarding the content of the studied notifications, it should be noted, first of all, that, although there is considerable topic diversity, there are some fields that predominate over the others. And, especially, one: the coronavirus pandemic represents 33.96% of the notifications sent by the analyzed media, as a whole, something to be expected on the other hand.

Next, and as shown in Graph 3, alerts on sports content (15.02%) and those related to Spanish politics (13.14%) are the most common. And, according to our research, notifications about the weather (9.80%), international information (8.90%), and related to the economy and employment (4.73%) are also of notable importance.

We interpret that these data are more related to a topic bet maintained over time and not so much with the news events that occurred in the analyzed periods, specifically, since there are hardly any differences in the notifications received about the pandemic, sports, national politics, and economy and employment in the two analyzed periods.

There is an exception to the previous statement: the high percentage of international affairs basically corresponds to the taking of the White House in January and the impeachment of the then president of the United States, Donald Trump. We affirm this after observing that 80% of notifications with an international topic were received between January 6th and 13th.

Notifications related to social issues (2.45%), lotteries and games (1.47%), religion (1.14%), culture (0.65%), sexist violence (0.41%), about other issues (3.10%), and several issues of different kinds in the same alert (3.67%) have also been received, although to a lesser extent. We have identified this last topic grouping with very specific alerts, which are sent first thing in the morning under the idea of "the news that you have to know to start the day", a common practice in *El País, ABC*, and *COPE*, especially.

Graph 3: *Topic of mobile notifications sent by the media (in percentage)*
Source: Self-made

Looking at each headline, we observe that the hegemony of the topic linked to the pandemic is once again the dominant one also separately. From there, if there are differences. Sport is the second most common topic in the notifications of *SER* (18.32%), *Onda Cero* (18.80%), and *La Vanguardia* (26.57%), while national politics is in the coverage of *COPE* (19.13%) and *ABC* (17.74%). On the other hand, the second most repeated in the notifications of *El Mundo* and *RTVE* is weather (15.94% and 14.56% of their alerts, respectively), in those of *El País*, international affairs (13.13%), and in *RNE*, cultural issues (20%).
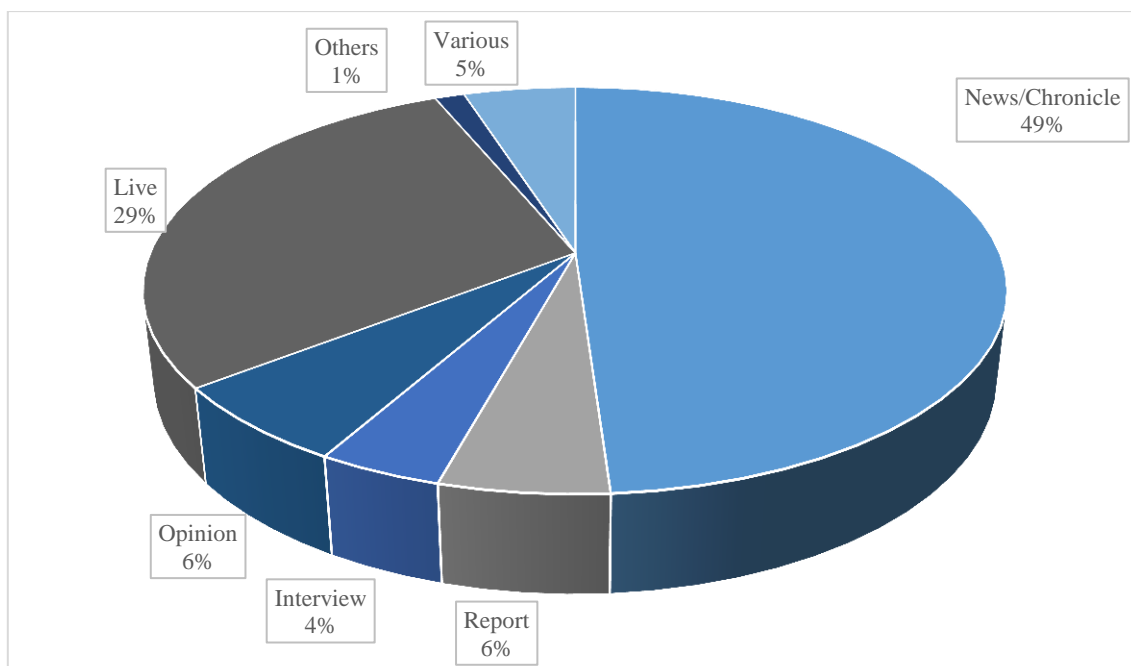
37.86% of the notifications are topics elaborated by the media outlet, original contents that are not repeated in other newspapers, radios, or televisions, while 62.14% of the notifications are journalistic publications that are derived from press conferences, announcements, official appearances, etc., which are repeated in various media.

It should be noted that practically all the media move, in this section, on similar originality data in terms of content: *El País*, 43.22%; *COPE*, 45.41%; *Onda Cero*, 47.46%; *El País*, 35%; *El Mundo*, 40.58; *ABC*, 30.89%. We only observe one positive exception, *Radio Nacional de España*, with 80% of notifications with original content, although it must be remembered that their notifications are scarce. And, on the opposite side, it should be noted that *La Vanguardia* and *RTVE* are the media outlets that send the least exclusive content alerts, 26.57% and 20.39%, in each case.

5.2.2. Use of journalistic genres and graphic elements

The two previous elements -the topic and originality or not of the journalistic publications- are closely related to the journalistic genres used. According to Graph 4, notifications basically respond to two criteria: breaking news and live information. This is deduced from the fact that 48.92% of the received alerts are identified with news or chronicles and that 29.16% do so with events that are taking place at that moment and that can be followed up to the minute in the mobile app of the media outlet in question.

The primacy of news and real-time relegates the rest of journalistic genres to almost ostracism: only 4% of the notifications refer to interviews, 6% to reports, and the same percentage to opinion content; other genres represent 1% of notifications and the mix of various genres, 5%.

Graph 4: *Journalistic genres of the publications sent as a notification (in percentage)*
Source: Self-made

If we look at each media separately, it is striking that *Cadena SER* is the one that focuses its notifications the most on news or chronicles (66.05%), followed by *ABC* (54.17%), and *La Vanguardia* (51.05%). On the other hand, we observed a primacy of notifications about lives in *RTVE* (49.47% of their cases), *El Mundo* (41.18%), *El País* (40.88%), and *Onda Cero* (36.36%). Furthermore, the opinion content that is collected in the cases of *Onda Cero* (25%) and *COPE* (17.83%) is relevant.
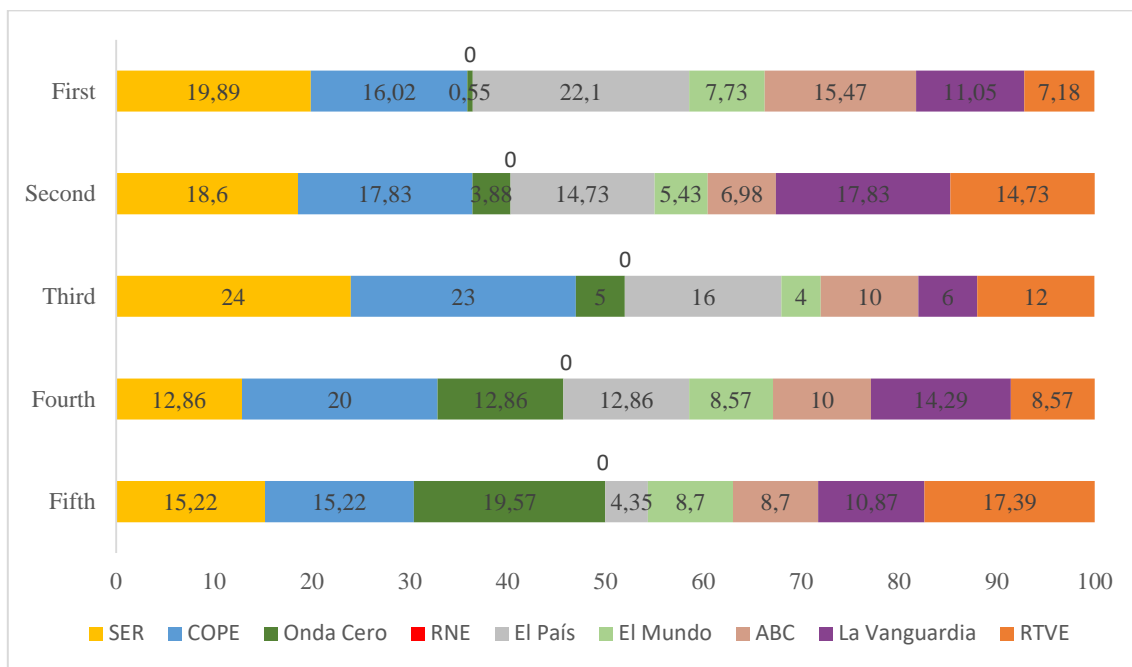
Regarding the use of images in the preview of notifications, it is striking that only a third of notifications -34.12%, exactly- is accompanied by a graphic resource, from photographs to infographics, etc. In this regard, we observe two clearly different trends: some media systematically use images in their notifications, and others bet only on text. In the first group, we find *ABC, Onda Cero, RTVE*, and *RNE*, which do include images in 99.19%, 98.31%, 66.99%, and 60% of their notifications, respectively. *El Mundo* (37.68% of the occasions) and *COPE* (27.39) also do it, occasionally. However, *Cadena SER* (3.66%), *El País* (1.88%), and *La Vanguardia* (3.50%) rarely incorporate images in their alerts.

5.3. Reaction and speed in sending notifications according to the media outlet

It is interesting to stop at how the analyzed media react when they send notifications about a news event that is not exclusive to said media. Graph 5 collects this variable and reflects that the newspaper *El País* is the media outlet that concentrates the most first notifications (22.1%), closely followed by *Cadena SER* (19.89%), *COPE* (16.02%), and *ABC* (15.47%). The speed of these media in sending alerts is confirmed because they are also the ones that concentrate the highest data when

looking at who sends the notifications in second place: *SER* (18.6%), *COPE* (17.83%), and *El País* (14.73%). The only variation that we find is that the rise of *La Vanguardia* -they agglutinate 17.83% of the second notifications- to the detriment of *ABC* -they fall to 6.98%-.

At the most negative extreme, *Radio Nacional de España*, which was not able to place a single notification among the five fastest among all those analyzed. We also observe, as shown in Graph 5, a slow reaction capacity from *Onda Cero*, protagonist, above all, in the fourth and fifth fastest notifications, and highly variable in *RTVE*.

Graph 5: *Media response to topics that are not of their creation (in percentage)*
Source: Self-made

Finally, the data reveal underuse of notifications as an advertising resource: only 13.93% of notifications include an advertisement before accessing journalistic content. And there are only four media that use this resource, *Cadena SER*, in 0.38% of their notifications; *RTVE*, in 1.01% of their notifications -and to self-promote-; *El País*, in 9.62% of their cases; and *COPE*, already in a more systematic way, in more than half of their notifications (55.86%).

6. Discussion and conclusions

The research allows us to conclude that all the Spanish media send notifications to the users of their respective mobile apps, although they do so unevenly. In general terms, informative alerts are systematized in the studied media, which denotes that the media have understood the importance of using the resources offered by mobile phones. This is a sample of innovation in the distribution of journalistic information that, indirectly, forces to reinvent the professional skills of journalists (García-Avilés et al., 2018).

The leading media are those that, in general, make the most and best use of mobile notifications. This is revealed by the quantitative and qualitative data from *Cadena SER, Cadena COPE,* and *El País*, the most listened to and read in their sector, respectively. This invites us to ask ourselves if it is

because they are also the media that have the greatest financial and human resources, an issue that, in any case, exceeds our research.

Beyond the differences between one and the other, the studied media send more notifications in the afternoon and, especially, at night-time slots, than in the morning and early morning slots. This shows a reality slightly different from that observed by Read in the case of the United Kingdom, where the author identified that it was around four and five in the afternoon when the most notifications were sent by the media (2017). In our study, even though this is a widely used time slot, it is after six in the afternoon when more push notifications are detected.

As in the Wheatley and Ferrer-Conill study, there is no clear pattern regarding the sending of alerts throughout the week, in our case with the exception that notifications drop significantly on Sundays and holidays, something closely related to professional journalism practices. We agree with the interpretation of these authors that "there are no strict rules regarding the number of notifications they send each day" (2020, p. 10).

One of the novelties provided by this study is that it detects that the media use notifications to basically broadcast live events that are taking place at that time. Also, reporting on breaking news, a common practice in journalism (Rom and Reich, 2017). This idea has already been highlighted as a potentiality in previous studies, such as the one by Canavilhas: "Smartphones can be used, mainly, for breaking news […]. Through push alerts, radios and televisions can enjoy the proximity of the device to their user to attract consumers" (2013, p. 29).

Information about the coronavirus pandemic, sports, and national politics are the three most common topics in notifications sent by the media. The first two are closely linked to both breaking news and live events, while national politics is almost exclusively linked to news. Although there are no studies that allow us to compare the prevalence of these issues, the abundance of alerts about politics corroborates the idea of Varona et al. that mobile phones are "the perfect complement for users very willing to inform themselves about politics" (2017, p. 643).

There are two aspects in which there is an evident margin of improvement in the apps of the Spanish media: on the one hand, in the use of images and other graphic resources in the content preview; on the other, in the adaptation of the contents, since there are many alerts that cannot be displayed in the app, but rather direct the user to the media outlet's website. This calls into question the idea detected by Valverde and Aguado (2010) a decade ago of the existence of a stream of content creation specific for mobile devices. Indeed, we confirm this thesis, but we warn that it is not yet the dominant one. According to Brown (2018), the inappropriate use of images is related to the lack of adequate tools in the writing process, the low value of such images due to their excessively small size, or the risk of often repeating the same images if the topics are similar.

We observe, on the other hand, and with the sole exception of *COPE*, that the media hardly insert advertising in the journalistic content they send to their users. And we understand that advertising could be a way to obtain interesting income, especially taking into account what Peinado and Mateos underline: "The monetization of media apps is based on the fact that 95% of the apps are free and 5% are paid, of which a few are focused on media with dynamic information" (2016, p. 337).

The study poses some limitations. One of them is that it is focused on receiving notifications on Android terminals, and not on mobiles with an iOS operating system, which, although representing a much lower percentage than the former, also have a notable presence in the market. Therefore, it would be interesting to compare whether or not there are differences.

Finally, the research opens the door to others that, in the future, will allow determining if there is an evolution in the points analyzed in this research or if there is a stagnation in media strategies. Likewise, and although it moves away from our object of study on this occasion, it would also be interesting to delve into the study of the journalistic content that is sent in these notifications: not only in the topics, in general, as we propose, but, for example, in the approaches to those topics.

7. Bibliography

Aguado, J. y Navarro, H. (2013). Comunicación móvil, ecosistema digital e industrias culturales. En: Aguado, J., Feijóo, C., y Martínez, I. (coords.). *La comunicación móvil: Hacia un nuevo ecosistema digital.* Gedisa.

APP Annie (2021). *State of mobile 2021.* https://www.appannie.com/en/go/state-of-mobile-2021/?utm_source=digital-2021&utm_medium=partnership&utm_campaign=ww-logo-201910-1910-digital-2021-partnership&utm_content=report-&sfdcid=7016F000002MS1c

Asociación para la Investigación de Medios de Comunicación (AIMC) (2020). *Marco general de los medios en España.* https://www.aimc.es/a1mc-c0nt3nt/uploads/2020/01/marco2020.pdf

Asociación para la Investigación de Medios de Comunicación (AIMC) (2021). *Estudio General de Medios. Cadenas de radio.* https://reporting.aimc.es/index.html#/main/radio

Asociación para la Investigación de Medios de Comunicación (AIMC) (2021). *Estudio General de Medios. Ranking de diarios*. https://reporting.aimc.es/index.html#/main/diarios

Bausela, E. (2005). SPSS: Un instrumento de análisis de datos cuantitativos. *Revista de Informática Educativa y Medios Audiovisuales*, *2* (4), 62-69. http://laboratorios.fi.uba.ar/lie/Revista/Articulos/020204/A3mar2005.pdf

Berelson, B. (1952). *Content Analysis in Communication Content*. University of Chicago-Columbia University.

Brown, P. (2018). *Pushed Even Further: US Newsrooms View Mobile Alerts as a Standalone Platform.* The Tow Center for Digital Journalism. https://www.cjr.org/tow_center_reports/newsrooms-view-mobile-alerts-as-standalone-platform.php

Canavilhas, J. (2013). Modelos informativos para aparatos móviles: información hipermultimediática y personalizada. En: González, S., Canavilhas, J., Carvajal, M., Lerma, C. y Cobos, T. *Hacia el periodismo móvil*. Revista Mediterránea de Comunicación.

Canavilhas, J. y Cavallari, D. (2011). Jornalismo para plataformas móveis de 2008 a 2011: da autonomia à emancipação. *Libero, 14*, (28), 53-66. https://casperlibero.edu.br/wp-content/uploads/2014/05/2-Jornalismo-para-plataformas-m%C3%B3veis-de-2008-a-2011.pdf

Castañeda, M. B., Cabrera, A., Navarro, Y. y de Vries, W. (2010). *Procesamiento de datos y análisis estadísticos utilizando SPSS. Un libro práctico para investigadores y administradores educativos*. EDIPUCRS.

Cobos, T. L. (2012). Periodismo móvil: la prensa mexicana y su incursión en plataformas móviles. Casos El Universal y El Norte. *Virtualis, 6,* 84-100. https://www.revistavirtualis.mx/index.php/virtualis/article/view/64

Costa-Sánchez, C. (2014). Las singularidades del medio móvil: Integración multimedia, personalización, geolocalización y participación. Estudio de su presencia en las apps de la prensa española. *Palabra Clave, 17* (3), 672-694. http://dx.doi.org/10.5294/pacla.2014.17.3.5

De Sola, J. (2020). La cobertura de la Cumbre del Clima Chile Madrid COP25 en los informativos de la radio española. *AdComunica. Revista Científica del Estrategias, Tendencias e Innovación en Comunicación, 20*, 205-230. http://dx.doi.org/10.6035/2174-0992.2020.20.9

Fidalgo, A. (2009). Pushed News: When the News Comes to the Cellphone. *Brazilian Journalism Research,* 5 (2), 113–124. https://doi.org/10.25200/BJR.v5n2.2009.214

García-Avilés, J. A., Carvajal, M. y Arias, F. (2018). Implantación de la innovación en los cibermedios españoles: análisis de las percepciones de los periodistas. *Revista Latina de Comunicación Social*, *73*, 369-384. http://dx.doi.org/10.4185/RLCS-2018-1260

García, N. (2013). *Presencia de las redes sociales y medios de comunicación: representación y participación periodística en el nuevo contexto social* [Tesis, Universidad de Sevilla]. Repositorio institucional. https://idus.us.es/handle/11441/15976

Gil-Ramírez, M. y Gómez de Travesedo, R. (2016). Uso del smartphone en el periodismo actual: ¿hacia un nuevo modelo mediático? Estudio de caso del contexto malagueño. *Ámbitos. Revista Internacional de Comunicación, 41*, 5-21. https://doi.org/10.12795/Ambitos.2018.i41.01

Gómez-García, S., Gil-Torres, A., Carrillo-Vera, J., y Navarro-Sierra, N. (2019). Creando a Donald Trump: Las apps en el discurso político sobre el presidente de Estados Unidos. *Comunicar*, 59, 49-59. https://doi.org/10.3916/C59-2019-05

Kemp, S. (2021). *Digital 2021. Global overview report.* https://wearesocial.com/digital-2021

Krippendorff, Klaus (2004). *Content Analysis. And Introduction to its Methodology*. Thousand Oaks.

Larrondo, A. y Teixeira, J. (2016). La convergencia narrativa en el periodismo móvil. Aproximación a la integración del contenido audiovisual en los productos nativos para iPad. *Estudios sobre el Mensaje Periodístico, 22* (2), 777-792. http://dx.doi.org/10.5209/ESMP.54235

Ling, R., Fortunati, L., Goggin, G., Lim, S. S. y Li, Y. (eds.) (2020). *The Oxford Handbook of Mobile Communication and Society*. Oxford University Press.

López-García, X., Silva-Rodríguez, A., Vizoso-García, A. A., Westlund, O. y Canavilhas, J. (2019). Periodismo móvil: Revisión sistemática de la producción científica. *Comunicar, 59* (27), 9-18. https://doi.org/10.3916/C59-2019-01

Manovich, L. (2013). *El software toma el mando*. UOC.

Márquez, I. (2017). El Smartphone como metamedio. *Observatorio. Investigaçáo e Saber em Comunicaçáo, 11* (2). https://doi.org/10.15847/obsOBS11220171033

Martínez, F. (2014). *Los nuevos medios y el periodismo de medios sociales* [Tesis, Universidad Complutense de Madrid]. Repositorio institucional. https://eprints.ucm.es/id/eprint/24592/

Mena, M. (2020). *Android e iOS dominan el mercado de los smartphones.* Statista. https://es.statista.com/grafico/18920/cuota-de-mercado-mundial-de-smartphones-por-sistema-operativo/#:~:text=Seg%C3%BAn%20datos%20de%20la%20consultora,Apple%20casi%20el%2014%25%20restante

Nel, F. y Westlund, O. (2012). The 4cs' of Mobile News: Channels, conversation, content and commerce. *Journalism Practice, 6* (5-6), 744-753. https://doi.org/10.1080/17512786.2012.667278

Newman, N., Fletcher, R., Kalogeropoulos, A. y Nielsen, R. K. (2019). *Reuters Institute Digital News Report 2019.* Reuters Institute for the Study of Journalism. https://reutersinstitute.politics.ox.ac.uk/sites/default/files/inline-files/DNR_2019_FINAL.pdf

Olivero, E. (2018). *El Uso de las Apps en España y en el Mundo en 2018.* https://pickaso.com/2018/uso-apps-espana-y-mundo-2018

Parra, D. (2008). Ciberperiodismo móvil: el peso específico de la cuarta pantalla en el panorama informativo internacional. *Re-presentaciones: periodismo, comunicación y sociedad, 2*(4), 73-91. Disponible en https://dialnet.unirioja.es/servlet/articulo?codigo=2990230

Peinado, F. y Mateos, J. P. (2016): Promoción y monetización de las aplicaciones móviles editoriales, *Icono 14, 14* (2): 329-352. https://doi.org/10.7195/ri14.v14i2.974

Pulgar, F. y Maniega, D. (2012). *Liburutegiak: una aplicación para servicios bibliotecarios en Red.* VI Congreso Nacional de Bibliotecas Públicas. Jaén, España. http://travesia.mcu.es/portalnb/jspui/bitstream/10421/6745/1/liburutegiak.pdf

Ramos del Cano, F. y González-Molina, S. (2015). Una propuesta de análisis metodológico para evaluar las app informativas de los medios de comunicación. En Sabés, F. y Verón, J. J. (coords.). *Innovación y cambio en la comunicación postindustrial.* Asociación de Periodistas de Aragón.

Read, M. (2017). Analysis: *The Reality of Online News Consumption*. Mediatel. https://mediatel.co.uk/news/2017/07/31/analysis-the-reality-of-online-news-consumption

Rivero, F. (2018). *Mobile en España y en el mundo 2018.* https://mktefa.ditrendia.es/hubfs/Ditrendia-Informe%20Mobile%202018.pdf?utm_campaign=Informe%20Mobile%202018&utm_medium=email&_hsmi=64334773&_hsenc=p2ANqtz-8eqABfU3baOqFeey94FwzS_A6IP4BMZK2fwww6LojlkzyC7LAeJJ0JugwgFJhoQGqjXrbLwPdxVPtxUY74fS7dh1kiuw&utm_content=64334773&utm_source=hs_automation

Robledo-Dioses, K. (2017). Evolución del periodismo: aportes mediáticos a la consolidación de la profesión. *Comhumanitas: revista científica de comunicación, 8*(1), 1-27. https://dialnet.unirioja.es/descarga/articulo/6057561.pdf

Rom, S. y Reich, Z. (2017). Between the technological hare and the journalistic tortoise: Minimization of knowledge claims in online news flashes. *Journalism*, 21, 54-72. https://doi.org/10.1177/1464884917740050

Sánchez-Aranda, J. J. (2005). Análisis de contenido cuantitativo de medios. En Berganza, M. R. y Ruiz, J. A. (coords). *Investigar en Comunicación. Guía práctica de métodos y técnicas de investigación social en Comunicación.* McGraw Hill.

Valverde, E. y Aguado, J. (2010). *Dispositivos móviles y convergencia digital en los grupos de comunicación españoles: la perspectiva de los profesionales.* II Congreso Internacional AE-IC: Comunicación y desarrollo en la era digital. Málaga, España. http://www.aeic.org/malaga2010/upload/ok/95.pdf

Varona-Aramburu, D.; Sánchez-Martín, M.; Arrocha, R. (2017). Consumo de información política en dispositivos móviles en España: caracterización del usuario tipo y su interacción con las noticias. *El profesional de la información, 26* (4), 641-648. https://doi.org/10.3145/epi.2017.jul.08

Victoria, J. (2002). El análisis de contenido: una técnica para explorar y sistematizar información. XXI. *Revista de Educación, 4*, 95-105. http://rabida.uhu.es/dspace/bitstream/handle/10272/1913/b15141895.pdf?sequence=1

Westlund, O. (2015). News Consumption in an Age of Mobile Media: Patterns, People, Place and Participation. *Mobile Media & Communication, 3* (2). http://dx.doi.org/10.1177/2050157914563369

Wheatley, D. y Ferrer-Conill, R. (2020). The Temporal Nature of Mobile Push Notification Alerts: A Study of European News Outlets' Dissemination Patterns. *Digital Journalism*. https://doi.org/10.1080/21670811.2020.1799425

Wimmer, Roger y Dominick, Joseph (1996). *La investigación científica de los medios de comunicación. Una introducción a sus métodos.* Bosch Comunicación

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