Article

Comparison of Publishing and Consumption Patterns in Greek Media Websites

Evangelia Avraam *, Andreas Veglis (ID) **and Charalampos Dimoulas** (ID)

School of Journalism & Mass Communication, Aristotle University of Thessaloniki, 54124 Thessaloniki, Greece; veglis@jour.auth.gr (A.V.); babis@jour.auth.gr (C.D.)
* Correspondence: avraam@jour.auth.gr

Abstract: The web publishing strategy of media organizations is a very important factor in their success. The aim of the strategy is to cover their audience's news article consumption needs, but is this valid? In order to address this question, this paper compares data from two studies, namely a study that explored the publishing patterns of the top 22 Greek media websites and a second study that focused on web news article consumption habits. The results indicate that there are various deviations between the compared data, and thus the study concludes that Greek media organization publishing strategy is not aligned with the audience consumption needs. The identified discrepancies have to do with the published news articles after 14:00 during weekdays as well as the news articles that are available during weekends. Additionally, it seems that media organizations publish a very limited number of articles on specific thematic categories that the audience is interested in reading. Specific actions were also proposed in order to alleviate those deviations and thus improve the readability of the media organizations.

Keywords: publishing patterns; consumption patterns; media; web news article; weekdays; weekends; article type

1. Introduction

The digitalization of media companies began in the early 1980s and was steadily accelerated with the introduction of the internet and its services. This process completely transformed the journalism practice as well as the process of news consumption (Kolodzy 2006; Siapera and Veglis 2012). Media companies have gradually transformed into multichannel organizations, thus offering alternative dissemination channels (www, RSS, web-push notifications, mobile apps, social networking, microblogging to name some of them) (Veglis 2012), while also struggling to retain their traditional publication channels (Lawson-Borders 2003). In this way, they were able to approach different audience groups that possess distinct news consumption characteristics and are not employing traditional media channels (print, radio, and TV) (Avraam et al. 2021a; Taneja et al. 2012). This shift to digital media resulted in a migration of news consumption (Lin 2001) and a weakening of the relations between the audience and the traditional media organizations (Kayany and Yelsma 2000; Kwak et al. 2020). However, an unexpected factor, such as the restrictions on movements caused by the COVID-19 pandemic, has fueled an increase in TV news consumption across a number of European countries (Newman et al. 2021). If that is a temporary change, it remains to be seen.

At the same time, new kinds of media entities emerged (Google, Facebook, etc.), and although they are not considered to be media themselves, they disseminate news content from media organizations, citizen journalists, and other content creators (Holton et al. 2013) and control, to a significant extent, the news that the public consumes (Brake 2017). Social media has further altered the way the audience consumes information (Schmidt et al. 2017) by partly relinquishing the dissemination supervision from the media organizations and

assigning it to the audience. The use of social media for accessing news is very strong, especially in younger ages and people with lower educational levels (Newman et al. 2021)

Understanding news consumption habits is very important in order for media organizations to be successful (Wolf and Schnauber 2015) because the number of clicks on news articles is directly related to advertising revenues (Kwak et al. 2020). Media organizations have to compete with other stakeholders (social media, news aggregators) in order to attract the audience to their websites. In general, access to news content is becoming more distributed (Newman et al. 2021). Flaxman et al. (2016) suggested that the majority of users still access directly the website of their favorite mainstream news outlet. Nevertheless, five years later, Reuter's Digital News Report (Newman et al. 2021) indicated that only 25% of users in Europe go directly to the medias' websites to consume news content. This percentage is decreasing significantly every year (Newman et al. 2020; Newman et al. 2019). In the case of Greece, news consumption has become very fragmented. Digital News Report (Newman et al. 2021) reports that Greek users employ more digital news sources per week than most of the 46 countries included in the report.

Thus, the study of media organization website traffic has attracted a lot of attention from media scholars (Kristensen 2021; Zamith et al. 2020). On the other hand, media organizations' publishing patterns need to be studied in order to ensure that they are compatible with users' consumption habits. It is worth noting that several factors relate to media organizations' publishing patterns. News is produced 24 h a day, 7 days a week. Breaking news is released almost instantly through various publication channels (Avraam et al. 2021a). Additionally, some major media organizations employ a combination of "real-time" adaptation of events, audience personalization preferences, and media specialization, through the analysis of statistical data which determine the web traffic of the media organization (American Press Institute 2014). The latter aims in optimizing services provided to the audience.

Content consumption has been investigated quite thoroughly in the broadcast industry (Avraam 2012). Consumption patterns have been identified, named dayparts, and were broadly defined as consecutive blocks of time on similar days (weekdays or weekends), during which the size of the audience is homogeneous as is the characterization of the group using the medium (Beyers 2004; Collective 2013; OPA 2003; Pascual 2004; Veglis 2014). This was achieved by measuring the flow of viewers during the day and matching it with the broadcast programs (Sherman 1995). This characteristic has been heavily exploited by the advertisement industry by applying targeted advertisement (MORI Research 2003). When WWW was introduced, initially it was believed that the concept of dayparting will not be applicable, but two studies conducted in the USA (MORI Research 2003; Online Publishers Association 2003) provided evidence for the existence of dayparts in the case of news consumption. In 2008, Burst Media published a study that focused on the internet habits of women above 25 years old, also confirming the presence of the daypart phenomenon in news consumption. One year later, Newell et al. (2008) reached a similar conclusion in a study on media consumption, which compared new media usage with other traditional media (newspapers, magazines, radio, and television). Five years later, Veglis (2014) acknowledged the existence of dayparts in traffic data from Greek media websites. Finally, Avraam et al. (2021a) proposed a dayparting model for news consumption in Greece. To all the above, the parameter of the multiple devices (smartphones, tablets, PCs, smart TVs) through which the audience can access the internet should be added, and thus device dayparts should also be considered (Collective 2013).

Mitchelstein and Boczkowski (2010) suggested that the consumption of news on the internet exhibits many similarities with the consumption of news in traditional media. Pilotta et al. (2004) proposed a media consumption model which included various parameters, among which were the amount of time each user spent with each media form by daypart. In 2005, the model was further developed, but the key factor, as expected, remained the amount of time that a user consumes news from a particular media form (Schultz et al. 2005). Yuan (2011) researched news consumption across multiple media platforms and identified

complementary and converging patterns of media use. Other factors also were identified to affect news consumption—for example, news recommendation engines (Thorson 2008).

There are two methods for measuring news consumption. The first one employs web traffic data. The problem is that such data that are collected by the media organization is difficult to procure because it is very rare (for various reasons) for major media organizations to release traffic data to third parties. The second method is to conduct audience surveys. The disadvantage of this method is that it requires a considerable amount of work in order to gather data. On the other hand, the provided data, because they are organized per survey participant, can be used to run statistical analysis that can lead to interesting results.

Although users' consumption behavior seems to have been investigated to a significant extent, there are no studies on the actual publishing patterns of media websites. Such a study faces significant difficulties in being implemented because it requires substantial resources and a considerable amount of data. Of course, one might argue that publishing patterns depend on the news flow, but this is valid to a certain extent. Media organizations do not report only on breaking news. On the contrary, breaking news seems to be the minority of the published news.

Though media organizations keep a record of the articles they publish during the day, it is quite difficult to obtain such data directly from them. Thus, third-party services (media monitoring) need to be employed, something that is quite expensive in the case that data from many media organizations and for long periods needs to be collected.

Taking into account the previous discussion, one would assume that media organizations have adopted their publishing cycles in order to be compatible with the users' consumption habits (Pilotta et al. 2004). This is very significant because research has identified a significant shift in media consumption from the incumbent media to new media and especially to WWW (Newell et al. 2008). Armould (2003) has also suggested that there is a gap between the information offered by media organizations and the expectations of the audience throughout the day. The publishing strategy of a media organization is a very important parameter of its success in the continuously changing media landscape (Järventie-Thesleff et al. 2014). This paper attempts to investigate whether media organizations' publishing patterns are compatible with audience's consumption patterns and if there are deviations, to propose any necessary adjustments that need to be made in order for a media organization to optimize their publishing strategy and thus increase the dissemination of their news and also their revenues.

Based on the above discussion, the following research questions have been formulated and are addressed in this study:

1. Are the publishing patterns of Greek media websites compatible with the audience's consumption patterns?
2. Are there any adjustments that need to be made in order for the publishing patterns of Greek media websites to be compatible with the audience's consumption patterns?

2. Materials and Methods

In order to implement this comparative study, we employ secondary data from two previous studies we have conducted during the last one and a half years. Specifically, the first study (Avraam et al. 2021a) focused on the publishing patterns of the top 22 Greek media websites. The data sample included 562 thousand news articles from a period of four and a half months (July 1st until the 15th of November 2020) and was obtained from the leading media monitoring company in Greece, INNEWS. Each article was characterized as belonging to a specific category in relation to its content. Eleven content categories defined by INNEWS were employed (politics, economy, society, international, culture, health, technology, sports, tourism, lifestyle, and various). Moreover, for each article, a specific timestamp (publication date and time) was included in the data. Data were obtained in the form of CSV files (one for each media website). It was then imported into a single XLSX file where all the analysis took place. Specifically specific data and time

functions were employed to extract the data and the time from the original publication timestamp. Thus, data was suitable for further analysis (calculation of the average number of published articles per day and per (time) period).

The second study explored the web news articles consumption habits of 171 Greek journalism and communication university students (Avraam et al. 2021b). The selection of this group was based on the fact that they exhibit a very high percentage of internet usage, a high interest in news consumption, and are considered to be above average computing devices users. A web questionnaire with 15 close-ended questions which was deployed on the Lime Survey platform of the School of Journalism and Mass Communication of the Aristotle University of Thessaloniki was the survey tool. The survey was conducted from the 15th to the 25th of May 2021. The data was exported from the lime survey platform in the form of XLSX file in which all the necessary analyses were conducted. For both studies, Microsoft Excel 365 (Microsoft, Redmond, Washington, USA, version 365) was employed.

It is worth noting that there are some distinct differences between the data from the two studies that need to be taken into account. The first study measured the actual number of publications during a four and a half months' time period. Thus, the obtained data are average numbers of articles per specific time frame. The second study measured the consumption behavior of the participants, with the help of a Likert scale (1–5) that recorded the probability of consuming news during specific periods. That is the reason for the existence of two y-axes in the comparative charts that are included in the results section. Nevertheless, the aim of the comparative study is not to directly compare the values reported by the two studies but to associate the trends that the two sets of data exhibit. Another point that is worth mentioning is that although in the first study that measured the publication patterns the exact publication date and time were recorded, the consumption survey measured news consumption probabilities related to specific periods (00:01–6:00, 6:01–8:00, 8:01–10:00, 10:01–12:00, 12:01–14:00, 14:01–16:00. 16:01–18:00, 18:01–20:00, 20:01–22:00, and 22:01–00:00). In order to normalize the periods, the average numbers of articles were calculated from the publication data, for each of the previously mentioned periods.

3. Results

The first issue that needs to be investigated involves the comparison of the publication and consumption rates during the days of the week. The available data include the average number of articles published per day of the week and the consumption rates (on a scale of 1 to 5) that state the probability of consuming news on each day of the week. Figure 1 displays the previously mentioned data in a double *y*-axis. The publication rate seems to increase slightly from Monday to Thursday, which seems to be the day with the maximum number of published news articles. On Fridays, the average number of published articles decreases slightly. On the other hand, the consumption rate during the working days is fluctuating, and it appears that Monday seems to be the day with the highest news article consumption rate. By comparing the publication and consumption rate, it appears that they exhibit their highest values on different days, but the differences are quite small. We can assume that during weekdays, the two rates remain approximately constant.

Moving to the weekends as was expected, the average numbers of published articles are significantly lower (more than 30%) than the number of articles during the weekdays. The difference between Saturday and Sunday is quite small, so it can be assumed that during weekends the average number of published articles remains constant. As far as the consumption rate during weekends is concerned, there is a measurable decrease, but this decrease is significantly lower than the decrease that is exhibited by the publication rate. Specifically, the decrease is less than 10%, one-third of the decrease that is found in the case of the publication rate.
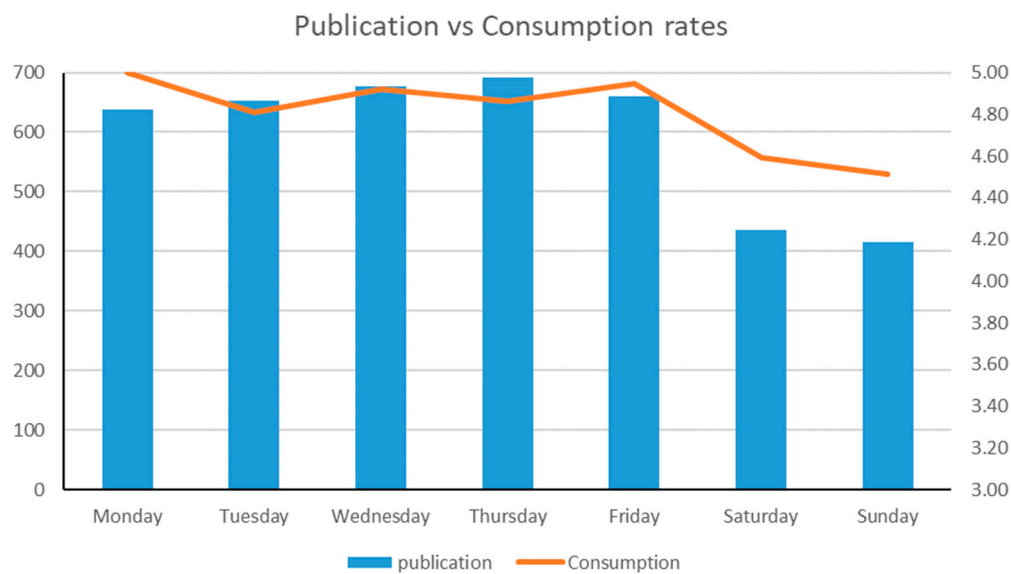
Figure 1. Comparison of the average number of published articles and reported consumption rates during weekdays and weekends.

The next issue that the comparative study focuses on is publication and consumption patterns throughout the 24 h of a day. Data is comprised of the average number of articles published during specific periods and the consumption rates (on a scale of 1 to 5) that states the probability of consuming news during the same specific periods. The plots of the above-mentioned data are plotted in a double *y*-axis in Figure 2. The publication patterns exhibit significant variations in the number of articles that are published during a twenty-four-hour period. During the morning hours (06:01–10:00), there is a sharp increase in the number of published news articles. From 10:01 to 12:00, the number of published news articles remains almost constant. Then, there is a decrease, and from 14:01 to 20:00, the average number of published articles remains constant. Finally, after 20:01, the publication rate decreases significantly, and this trend continues until the end of the day.
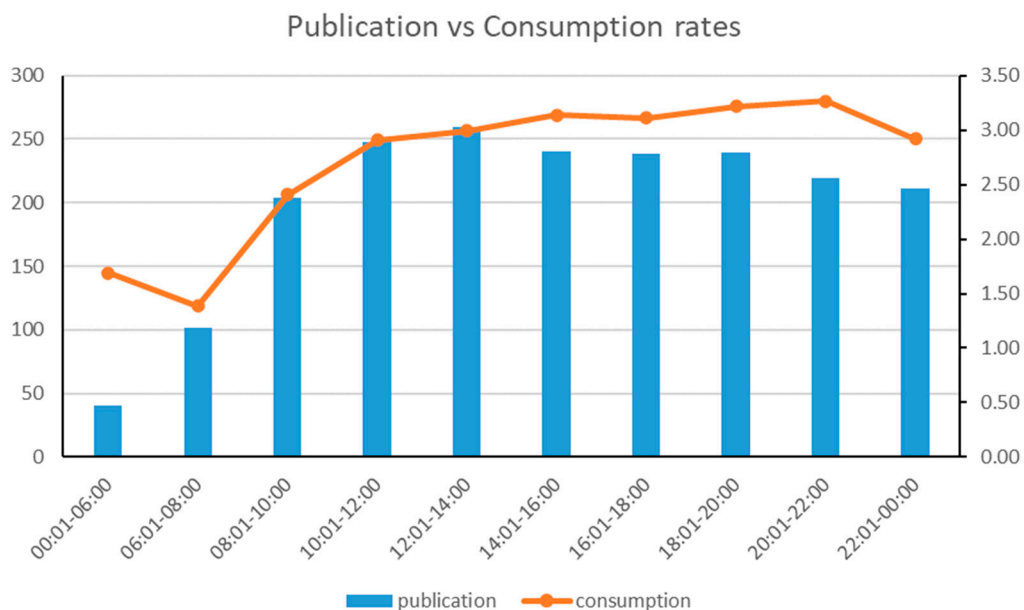

Figure 2. Comparison of the average number of published articles and reported consumption rates during different periods of the day.

Moving to the consumption data, a similar trend to the publication rate can be observed during the first part of the day and specifically from 00:01 to 14:00. In this part, it is obvious that the publication and consumption patterns are almost identical. Nevertheless, that is not valid after 14:00 because the consumption interest continues to grow very gradually and peaks at the 20:01–22:00 period, while at the same time the publication rate decreases. Although the highest value of the consumption rate is exhibited quite late, it is worth noting that from 10.01 up to 00.00 (in other words for 12 consecutive hours), the interest in news consumption remains high and almost constant. Another interesting variation is that during the night period (00:01–06:00), the maximum deviation between the publication and the consumption patterns is observed.

Another issue that can be included in this comparative study is the news article category. Specifically, the two studies have employed a common categorization of the news articles in eleven categories, as was mentioned in the previous section. Thus, in Figure 3, the average number of news articles per category and the consumption rates (on a scale of 1 to 5) that state the probability of consuming news in each category are plotted in a double *y*-axis. As far as publication patterns are concerned, international news articles and also news articles for society appear to have the majority of the published articles. A significant number of news articles about politics and the economy are also published. The rest of the categories appear to have very small numbers of published news articles. Moving to the consumption patterns, all categories appear to attract high levels of interest from the audience, with society, international, and health to be the three categories that attract the highest consumption interest. Overall, there seem to be significant deviations between the publishing and consumption patterns, something that indicates very significant deficiencies in media organizations' publication strategies.
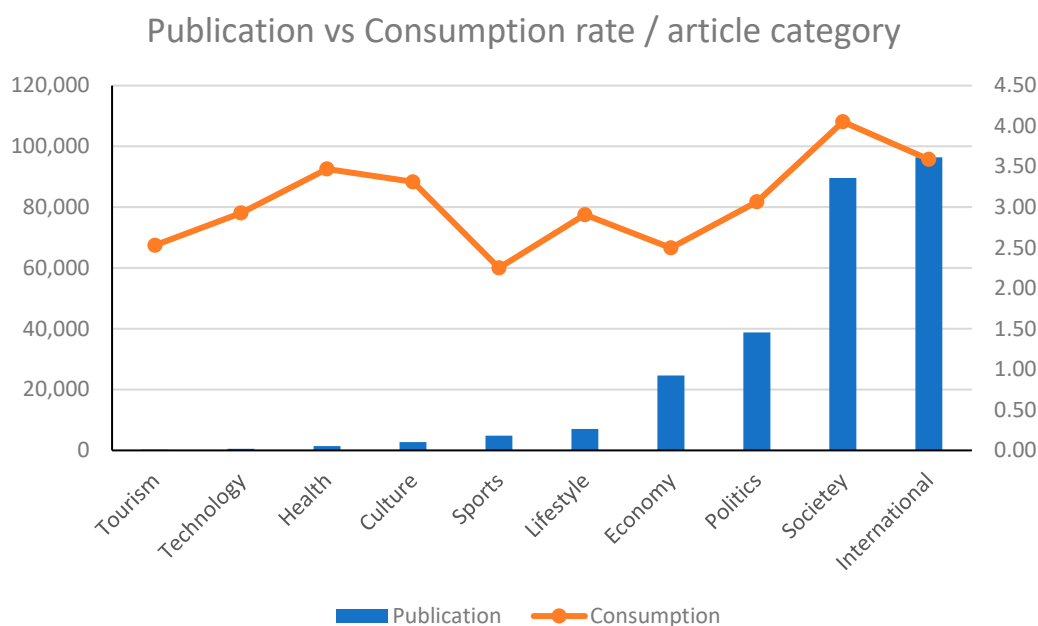

Figure 3. Comparison of the average number of published articles and reported audience's interest in various news articles' categories.

4. Discussion

Based on the comparison between the publication and the consumption data, useful assumptions can be derived that can answer the research questions of this study. As far as RQ1 is concerned, it is quite obvious that in many aspects, there are significant similarities between the publishing and the consumption patterns. Especially the publication patterns seem to be compatible with the consumption rate on the weekdays, during which the consumption rate remains relatively constant. Some fluctuations seem to appear in the

consumption rates, but generally, the consumption rate seems to remain the same from Monday to Friday. The significant deviation appears to be at the weekends during which the publication rate drops significantly while the decline in the consumption rate is relatively small. In other words, data suggest that media organizations do not cover the users' interest in consuming news during weekends. This fact is, from one point of view, understandable because during weekends, media organizations operate with reduced personnel. On the other hand, they can prepare during weekdays several news articles on no-topical issues and schedule them to be published online during weekends. Thus, they can alleviate to some degree the deficit between the publication and the news consumption interest during weekends.

Moving to the data from the different periods during the day the publication rate appears to be compatible with the consumption rate from 6:01 to 14:00, but after that, there are significant deviations. It seems that the consumption rate gradually increases and peaks at 20:01–22:00 period, while the publication rate decreases. It seems that audience consumption habits have changed considerably during the last 20 years because in the early 2000s period, it was reported that the users tend to abandon media organizations' websites after 16:00 h (Armould 2003) and also rely heavily on TV in order to be informed during evening and night (Mediascope Europe 2010). It is worth noting that in Greece, the majority of the national coverage TV stations broadcast their main news bulleting (Maniou 2013) early in the evening.

From the above, we can conclude that after 14:00, the media organizations' publication strategy deviates from the increasing users' interest to consume news articles. This deviation, although it appears to be quite moderate, spans across 10 h and thus creates a significant deficiency in the publication strategy and thus may significantly negatively affect media organizations' success. The same phenomenon can be observed during the night where the audience consumption interest is decreasing by 50% while the average publication rate is declining by almost 80%. The media organizations can eliminate those significant discrepancies in the publication strategies by moving or hiring personnel to afternoon shifts and scheduling the publication of nontopical articles during the night.

As far as the categories of news articles, media organizations tend to give priority to certain categories of articles (politics, society, international) while the audience appears to be equally interested in other news article categories. The lack of news articles in the categories of tourism, technology, health, and culture is very significant and constitutes one of the most important deficiencies in the media organizations' publication strategies. Of course, one may argue that the existence of thematic news portals that publish mainly health or sports news articles may justify to some extent the lack of news articles on those particular thematic categories. On the other hand, because the surveys were conducted during the COVID19 pandemic, one might expect that the media organizations would have published more news articles on health-related issues.

In order to directly address RQ2, although the publication and consumption patterns are found to be compatible to some degree, certain adjustments to the media organizations' publication strategies can be proposed:

- Increase the publication rate during weekends, after 14:00, and also during the night.
- Increase the publication rate of news articles on certain categories (Tourism, Technology, Health, Culture, sports lifestyle).

Of course, some of the proposed changes will inevitably have certain economic consequences to the media organization because they will increase their operational cost. Nevertheless, some other changes only have to do with changing certain aspects of the publishing schedule, and thus they do not result in any economic cost.

5. Conclusions and Limitations of the Study

This study presented a comparison between media organizations' publishing patterns and audience consumption patterns as far as news articles are concerned. The study exploited results from two previous studies that were conducted in 2020 and 2021.

This paper attempts to investigate whether media organizations' publishing patterns are compatible with the audience's consumption patterns, and if there are deviations, to propose any necessary adjustments that need to be made in order for a media organization to optimize their publishing strategy and thus increase the dissemination of their news and also their revenues. The study answered two research questions. Specifically, it identified specific areas where the media organizations' publishing strategies deviate from the audience's consumption patterns and thus create a significant gap (RQ1). These areas appear to be weekdays after 14:00 h, weekends, and specific articles thematic categories. Finally, the study proposed specific actions that can be taken by media organizations in order to render their publishing strategy compatible with the audiences' consumption patterns.

It is worth noting that this study also has certain limitations that need to be discussed. The data is collected in different periods, and that may affect the obtained results. Nevertheless, because the most significant factor that has appeared since the early 2020s is the COVID-19 pandemic, both data collection periods are situated after its appearance. Moreover, in the consumption data, the sample was comprised of a specific type of consumer, journalism and communication university students. This particular group is very interested in current events and also is considered to be above average computing device users. Thus, they do not constitute "typical readers". This fact is visible in the consumption hours that appear to be much more homogeneous compared to other studies ((MORI Research 2003; Online Publishers Association 2003) as well as in the thematic categories of the articles. Another thing worth mentioning is that the majority of the participants are women, and thus this may have affected their reported consumption tendency in their preferences for sports news articles. It is also worth noting that in the actual publication data, the category of sports news articles is quite low in the average number of published articles, but this may be caused by the fact that there are several media organizations that publishe exclusively sports news, and this type of organization was not included in the study. Moreover, the media organizations' publishing data includes the number of articles, and in many cases that number does not reflect new content but recycled existing content, the phenomenon that is known as churnalism (Saridou et al. 2017). Finally, one final note concerning the consumption interest for articles related to health issues—the pandemic situation the world is experiencing has certainly increased the interest in consuming health-related news articles, and that is evident in the consumption results, something out of the norm, especially for the age group of the participants of the consumption study.

The future extension of this study should address some additional parameters that seem to affect the news article consumption process. Device dayparts is a parameter that needs to be studied. A white paper by Collective (2013) suggested that smartphones are mainly used during the morning, and tablets during prime time (late afternoon-night), and different tasks are better suited for different devices. As we gradually move towards the era where news article consumption will be happening mainly through mobile smart devices, the device dayparts is something that needs to be studied in detail.

Another issue that should be taken into account in future related studies is what time spent reading the news means from a user perspective because the time spent does not necessarily indicate interest in, attention to, or even engagement with the news (Groot Kormelink and Meijer 2020; Pilotta et al. 2004). This can be caused by the fact that in many cases, the audience exhibits multitasking behavior which is related to content genres, dayparts, and social viewing (Voorveld and Viswanathan 2015). According to Mediascope Europe (2010), TV is the medium on which multitasking media consumption occurs. Another study reported the close relation between radio and internet usage (Radio Ad Lab 2007). All the above indicate that there are still a lot of issues that may play an important role in the process of news article consumption.

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