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The Internet of the Future
The Challenges of Human Interaction

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GENERAL INFORMATION

«Comunicar», Media Education Research Journal, is published by Grupo Comunicar Ediciones (VAT: G21116603). This established non-profit professional group, founded in 1988 in Spain, specialises in the field of media education. The journal has been in print continuously since 1994, published every three months of each year.

Contents are moderated by means of peer review, in accordance with the publication standards established in the APA (American Psychological Association) manual. Compliance with these requirements facilitates indexation in the main databases of international journals in this field, which increases the dissemination of the papers published and therefore raises the profile of the authors and their centres.

«Comunicar» is indexed in the Social Sciences Citation Index (SSCI), Journal Citation Reports (JCR), Scisearch, Scopus and over 270 databases, catalogues, search engines and international repertoires worldwide.

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Communicating in 140 Characters. How Journalists in Spain use Twitter

Comunicar en 140 caracteres. Cómo usan Twitter los comunicadores en España

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ABSTRACT

The emergence of Twitter appears to be changing information practices. Hence, a great deal of recent research is based on its popularity among communicators, reaching the conclusion that it serves to increase interactivity with readers. But to what degree is it true that it contributes to a type of journalism which is more open to the public? This research aims especially to clarify two main questions: what specific uses do journalists make of Twitter and to what extent does two-way interaction with the public take place through this medium? It is based on the quantitative analysis of a sample comprising almost 5 million tweets posted by 1,504 Spanish media communicators, perhaps the largest sample studied so far. The analysis shows the existence of a two-speed Twitter (with a minority of influential communicators and a majority who have little impact), which has negligible interaction with followers. With few exceptions, the communicators establish endogamous relationships on Twitter. They respond to, mention and retweet colleagues, failing to take advantage of the multidirectional potential offered by the platform. This research expands the empirical basis which can be used to consider and discuss the scope and limits of user participation in information events. Many authors have theorized on this subject, perhaps too enthusiastically and arguably from a somewhat utopian perspective.

RESUMEN

La irrupción de Twitter parece estar cambiando las prácticas informativas. De ahí que bastantes investigaciones recientes partan de su popularidad entre los comunicadores para concluir que sirve para aumentar la interactividad con los lectores. Pero ¿hasta qué punto es cierta su contribución a un periodismo más abierto a la ciudadanía? Este trabajo busca sobre todo contribuir a clarificar dos cuestiones principales: qué usos concretos dan a Twitter los periodistas y hasta qué punto se mantiene esa interacción –de ida y vuelta– con la ciudadanía gracias a este medio. Se basa en el análisis cuantitativo de una muestra de casi cinco millones de tuits correspondientes a 1.504 comunicadores de medios españoles; probablemente, la mayor muestra estudiada hasta ahora. El análisis constata la existencia de un Twitter a dos velocidades (con una minoría de comunicadores muy influyente y una mayoría con escaso impacto), pero una interacción con los seguidores prácticamente nula. Salvo excepciones, los comunicadores establecen en Twitter relaciones muy endogámicas, respondiendo, retuiteando y mencionando a colegas, desaprovechando así las potencialidades multidireccionales que ofrece esta plataforma. Esta investigación amplía la base empírica con la que pensar y discutir el alcance y los límites de la participación de los usuarios en los fenómenos informativos, que tantos autores han teorizado, quizá, con demasiado entusiasmo y, sin duda, con una perspectiva en cierta medida utópica.

KEYWORDS | PALABRAS CLAVE

Communication, journalism, social networks, digital communication, interactivity, Twitter, microblogging.
Comunicación, periodismo, redes sociales, comunicación digital, interactividad, Twitter, microblogging.

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1. Introduction

Twitter was born in March 2006. It was a unique voice in the polysemic concert of social networks. From that point on, although it has never been able to compete with Facebook, many consider it to be far more influential. It is said that it does not win elections, but there is not a politician in the world who does not spend some time, energy and resources on the service, especially during campaigns (Conway, Kenski, & Wang, 2015), nor any «celebrity» worth their salt, some with over 50 million followers. Its power is attested by the fact that it has even been blocked by several governments, such as Egypt, Iran and Turkey.

Its unique form of interaction has been welcomed by communicators, who feel especially at home on Twitter: due to its format, similar to headlines or short news items (Carrera, Sainz-de-Baranda, Herrero, & Limón, 2012); due to ease of interaction with sources, protagonists and even readers (Posetti, 2009); due to the fact it is useful for detecting, storing, indexing and recovering trends and news (Martínez, 2014); due to the adult profile of its users, «more serious» than that of other networks and more interested in the news (Miller, 2009; González, Fanjul, & Cabezuelo, 2015); due to its speed and brevity, ideal for informing readers of breaking news and following interesting journalists (Hermida, 2010).

In fact, the media created powerful profiles with millions of followers, with the result that little by little Twitter changed the way in which we communicate: there is not a prime time television programme which does not display the «hashtag» Twitter users can use to interact with each other, with the programme or with the sponsors; every radio chat show receives listeners' opinions via short messages on Twitter; the @ symbol appears together with the byline on columns and articles (Farhi, 2013); each communication medium has an official Twitter account on which they permanently post messages; editorial departments create jobs which did not exist before to generate contents for Twitter and other networks and to monitor everything that goes on in them.

But Twitter also has its weaknesses. Many people question how much truth there is in its messages and if they are not merely transmitting unfounded rumours (Sutter, 2009). Some are of the opinion that looking to Twitter for significant information is like searching for medical advice in a world of quacks (Goodman, 2009), as one has to negotiate tons of rubbish among totally irrelevant tweets. Twitter´s 140 character straitjacket is another important limitation together with the «timeline» structure itself: the actual effectiveness of the tweets which are posted is not known, as it would seem that no-one goes back to read previous posts. The interface also lacks intuitiveness and many people abandon the service before they understand it. Some of the keywords, abbreviations and language used by expert Twitter users appear to be characteristic of a sect. Also, the presence of anonymous profiles who post offensive and threatening tweets drives users away. Even the continuity of service is worrying as it is not profitable and may be unviable; the company still does not know how to convert its millions of users into clients. There is also the challenge of promoting loyalty, another unresolved issue for the network: various research studies have concluded that 60% of people who open a Twitter account do not return to it in the following month.

Despite these weaknesses and a few disagreements, (Lee, 2015), Twitter and communicators, as we have mentioned, have mutual affection for each other. If we accept that the hidden agenda of the platform is not to compete with professional journalism, as some conspiracy theory lovers have ventured (Winer, 2012), it has to be admitted that current academic literature seems to agree that the benefits of Twitter for communication outweigh the threats. Twitter is one of the most powerful journalistic tools to appear in the last ten years, according to Alan Rusbridger, of «The Guardian» (Elola, 2010). Professor Orihuela (2011) is also of the opinion that Twitter is an «indispensable» tool for journalism and that communicators should be aware of conversations which affect the news, their brand, and their medium, as well as facilitating permanent contact with their sources, monitoring trends, revealing exclusives, publishing news and interacting with the audience. Some emphasize the compatibility of the service with an increasingly important type of «data journalism», in compiling, screening and observing what is going on (Lorenz, 2013), with the credibility afforded by numbers (Gillmor, 2012).

There is even a part of this literature which reflects on the skills which future communicators will have to develop in this new environment of «compulsive hyperconnection and global information overload» (Aguaded, 2014: 7). Some believe that the criteria used to check sources and information provided by prosumers will be the same as they have always been, but a significant increase in precaution will be necessary (Hernández, 2013). There is also speculation about the future of schools of journalism, concluding that they will be obliged to change their focus towards the creation of contents for all types of applications, including those for mobile devices, and to equip future

professionals with the skills required by a market which has been blown away by the speed of Twitter (Franco, 2008): how to write headlines, select contents correctly and adapt them to each platform (De-Aguilera, 2009).

Twitter, especially, is thought to offer an unbeatable capacity for interaction with the audience, generating conversations with users and conducting them intelligently (Carrera, Herrero, Limón, Sainz, & Ocaña, 2012). It is also particularly useful for confirming news with direct witnesses, contrasting perspectives, debating points of view, preparing future articles and producing stories through the very people who will receive the information (Soria, 2015; Watson, 2015).

But has Twitter really changed the practice of the profession to such an extent? Recent academic research has tried to explain the correlation.

2. Status of the issue

Over and above the large amount of research relating to how the public uses the information published on the network, a significant number of papers which directly examine the use of Twitter have been written by communication professionals. Most of this research confirms that communicators prefer to use Twitter rather than other platforms. In the United States, a study carried out by PR Week / PR Newswire (2010) among 1,300 professionals in the communication industry concluded that over 50% of professional journalists use Twitter as an investigative tool when writing news articles. According to this analysis, one out of every three journalists acknowledges having quoted a Twitter post in a news article they were writing.

A study carried out on «How Spanish Journalists Are Using Twitter» (Carrera, Sainz-de-Baranda, Herrero, & Limón, 2012) reached the same conclusion, confirming also that the network most used by journalists is Twitter (95% of the 50 journalists interviewed use it very frequently), not only to transmit their own news (82%), but also to transmit information from other sources and from the competition (67%). Twitter is the preferred medium due to its speed and variety, and it is also used as a means to turn something viral. This latter fact was confirmed by researchers from ten Latin-American universities who analysed 5,010 messages from the communication media (García, Yezers'Ka, & al., 2011): the flow of information is greater on the microblogging platform, where the speed at which the news is spread and the possibility of contacting witnesses to events immediately is considered important. In this same vein, Martínez defended her doctoral thesis in 2014 on «The new media and journalism in social media» in which she concluded that, after interviewing 50 directors of Spanish media, Twitter was their preferred tool. The subsidiary company of PR Newswire in Brazil (2011) reached the same conclusion, establishing that it was also the preferred network for 73.4% of the almost 400 Brazilian journalists who were surveyed.

> Twitter was born in March 2006. It was a unique voice in the polysemic concert of social networks. From that point on, although it has never been able to compete with Facebook, many consider it to be far more influential. It is said that it does not win elections, but there is not a politician in the world who does not spend some time, energy and resources on the service, especially during campaigns.

Coming back to the United States, in 2013 «The State of the News Media 2013» was published, an annual report on the state of journalism published by The Pew Research Centre's Project for Excellence in Journalism. According to this report, Twitter had consolidated its reputation in the U.S.A. as a place to which both readers and journalists turn in order to discover the latest news updates. More recent research has confirmed the same data: in 2014 Oriella published a survey of 550 journalists from 15 countries in which he underlined the increase in the number of Twitter accounts held by those surveyed.

The spirit of belonging to the media itself has also been the subject of investigation, such as the research carried out by the Chilean professors Alberto López-Hermida and Cecilia Claro (2011), as well as the relationship between information and opinion (Lasorsa, Lewis, & Holton, 2012).

Much research has focused on investigating the

interactivity afforded by this platform: in the field of radio, in 2012 Susana Herrera and José Luis Requejo published an interesting study on how Spanish radio stations use Twitter, concluding that they fail to exploit the potential which the service offers. However, this data is in paradoxical contrast to the majority of research, which concludes that interactivity is what communication professionals value most. Take, for example, the study «Who am I and who are you?» (Carrera, Herrero, Limón, Sainz, & Ocaña, 2012), in which 91.24% of those surveyed stated that they would retweet comments made by any user, or the research on «What is going on? The 'twitterization' of the Columbian media» (Duque & Zúñiga, 2012), which highlights the use of Twitter as a place for debate with readers and where the news can be gone into in more depth. The conclusions reached by Noguera (2013) and Diezhandino (2012) seem to point in this same direction, confirming the self perception held by communicators that they have not lost contact with the public.

If we accept that the hidden agenda of the platform is not to compete with professional journalism, as some conspiracy theory lovers have ventured (Winer, 2012), it has to be admitted that current academic literature seems to agree that the benefits of Twitter for communication outweigh the threats. Twitter is one of the most powerful journalistic tools to appear in the last ten years.

3. Material and methods

This research analysed the behaviour on Twitter of 1,504 communicators in Spain. The sample was selected at random from the written press: 16 newspapers were chosen and all regular contributors who had published an article in them were included. After three inspections on days chosen at random, with the provision that some Sundays be included, an initial figure of 1,560 communicators was reached, which, after successive eliminations in order to avoid duplications and possible errors, was reduced to 1,504 communicators, authors of 4,687,215 tweets, almost five million messages. There is no evidence to date of any other research which has worked with such a large sample.

The newspapers which were included in the sample were, firstly, the eight Spanish daily newspapers with the largest readership according to the Spanish General Media Survey: «Marca», «El País», «As», «El Mundo», «La Vanguardia», «El Periódico», «Sport» and «El Mundo Deportivo». Also included were two of the most widely read national, not regional, dailies: «ABC» and «La Razón». To this were also added the two financial journals with the largest circulation: «Expansión» and «Cinco Días», as well as the three most widely sold newspapers in Malaga, where the research was conducted: «SUR», «Málaga Hoy» and «La Opinión de Málaga». Finally, «20 Minutos», an online newspaper with over a million readers daily, was also included.

The information was encoded by means of a Microsoft for Apple Excel spreadsheet, interrelating over 166,000 cells of data. For the statistical analysis of the data, measures of central tendency (mode, mean and median), measures of dispersion (standard deviation and variance), tables (simple data distribution, frequency distribution, interval frequency distribution and percentage frequency distribution) and graphs (histogrammes, circular graphics, word clouds, frequency polygons, and frequency curves) were used.

The research analyzed the behaviour of 40 variables relating to the identity and the activity of the account, and to the text published in the press.

4. Analysis and results

4.1. Sex, length of time the account has been open and frequency

The research defined six baseline hypotheses. The first of these examined various general aspects of the profiles and it was affirmed that Spanish communicators who use Twitter were for the most part male,

had held an account for over two years and posted at least three messages a day. The analysis of the profiles concluded that this hypothesis was only partly correct.

Regarding the use of Twitter, not all the communicators use it. The majority do, that is, 61% of the

sample, over half of the group which was analyzed, but far fewer than would be expected in a medium which, judging by the aforementioned research, enjoys popularity with communicators. The newspapers in the sample which hold proportionally more accounts are «20 Minutos» (76.92%) and «As» (76.19%); those which had fewest, «La Opinión de Málaga» (46.88%) and «La Razón» (37.50%).

In relation to sex, the first piece of data is paradoxical and striking: without taking into consideration the use of Twitter, 73.17% of the sample, that is, the majority, are male. Out of 1,504 communicators, with or without a Twitter account, women represent only 26.83%. In other words, those who write in the printed press, the sole criterion for being included in the sample, are for the most part male. The paradox is that despite the fact that in the last few years the media has become the foremost defender of parity between the sexes, in their editorial departments, at any rate, it would seem that women are in the minority. None of the newspapers comes close to the figures given by the Active Population Survey (EPA), which calculates that women represent 46.15% of the total workforce in Spain.

However, in relation to the use of Twitter, if we look at relative values, that is, the number of Twitter accounts in relation to the number of persons of the same sex, women outnumber men, as 67.09% of women have a Twitter account compared to 61.37% of men. Although this contradicts the aforementioned hypothesis, nonetheless, the average number of tweets posted by the men in the sample since the account was opened (5,638 tweets) is greater than the average number posted by the women (3,800 tweets). This data is confirmed when we look at the average number of tweets per day: women, 4.11; men, 5.52. That is to say, although the women hold a larger number of active Twitter accounts, the men make slightly more use of the service: they are somewhat more active than the women. In this respect, the prediction of the hypothesis is true. This is also the case in relation to the length of time the account has been open: 68.81% of the accounts analyzed were opened between 2010 and 2011.

4.2. Sense of belonging

The second hypothesis of this research affirmed that communicators identify themselves on Twitter as journalists, indicating that they belong to the newspaper for which they work. Firstly, 89.77% of the accounts include a «description» or «bio», and 94.30% of these descriptions indicate that the holder's profession is related to the communication industry, as they define themselves specifically as a «journalist», «reporter», «columnist», «copywriter», etc. This figure is exceedingly high and undoubtedly reflects a strong sense of belonging to the profession, which makes them appear more trustworthy in the eyes of their followers.

In relation to references to the newspaper, noticeable differences appear in the sample: those who identify most with their publishing houses would appear to be the communicators from «Cinco Días» and «20 Minutos», who name their newspaper in over 90% of the descriptions of their accounts; those who identify least with their publishers are those from «La Razón» (40%) and «Sur» (53.33%).

4.3. Influence of the accounts

In the third hypothesis, it is affirmed that the communicators analyzed have a high degree of influence, and that this is expressed in the number of followers, the retweeting of their messages, list membership or having their messages marked as favourites.

In effect, the data shows that the communicators show influence scores which are above the average 40 points, as the average for the sample analyzed was 44.99. Although these almost 5 points may not seem enough to talk about «influential profiles», the truth is that 73.51% of the total number of accounts analyzed score well above 40, but the accounts which have little or no activity significantly lower the arithmetical average.

Furthermore, the «Klout» Score states that scores over 60 are reserved for a select group of «very influential» accounts, representing a mere 5% of Internet users; however, in the case of this sample, this percentage increases significantly as accounts with scores of over 60 make up 10.21% of the sample, in other words, double the percentage which would be present in any other group of users. Of all the accounts which were analyzed, the profiles with the highest Klout Score are those held by Risto Mejide, Elvira Lindo, Guillem Balagué, Enrique Dans and Mister Chip.

Another of the variables examined which has a direct repercussion on the influence of an account is the number of «followers». The average number of followers in the sample is 12,959 followers per account. The reality is a little lower, as the median is 991 followers, due to the fact that some accounts with a large number of followers artificially push up this average. In any case, the average number of followers is well above the average number for the typical

Twitter user, which is estimated at 61 followers. Mejide, for example, has more than two million followers; Jordi Évole, almost two million; not far behind is Alexis Martín Tamayo, Mister Chip.

The number of messages retweeted by other users is a further indicator of influence. Retweeting may be interpreted in many ways, but it always involves relative adhesion to the message which is resent. 23.51% of the posts in the sample were retweeted by others. This figure is extremely high, but it is insignificant if we compare it to the 93.84% of messages posted by Mister Chip which were retweeted by other users. Moreover, if we examine not the percentage of tweets which were retweeted by others, but the number of times they were retweeted, the figures shoot up astoundingly, reaching those of «celebrities»: Mister Chip, over a million times; Tomás Roncero and Mejide, over half a million times (note: after analyzing only the 3,200 tweets which Twitter allows the recovery of from each account).

Another variable relating to influence is the number of lists created by users which include the account in question. The average figure in the sample is 217.85 lists per account, a truly extraordinary figure. The two accounts in the sample which were included in the highest number of lists are those belonging to Évole and Ignacio Escolar, which were present in over 10,000 lists. The person with the highest rate of incidence «in lists per 1,000 followers» is Professor Dans, with almost 40 lists per 1,000 followers.

Finally, the fact that a tweet is marked as «favourite» by another user is also a factor which affects the influence a user has on others, as it is an indicator of the interest which his or her messages arouses. The data repeats itself: the sample average is 288 tweets marked as favourite. 92.3% of the messages posted by Míster Chip were marked as favourite. The analyzed tweets posted by Mejide were marked as favourite 178, 198 times. These are undoubtedly spectacular figures.

4.4. Mediatic communicators

The fourth hypothesis stated that the communicators with greatest influence on Twitter are those who combine their presence in the written press with presence in other forms of media, such as radio or television.

This research interrelated several variables in order to select the profiles in the sample with the greatest influence, such as those with the highest Klout Score, the largest number of followers and the most number of times their posts were retweeted. Once the 15 most influential accounts had been identified, it was found that the hypothesis was confirmed without exception, as all of them conduct their professional activities not only in the written press but in different audiovisual media.

4.5. Interactivity

The fifth hypothesis dealt with one of the aspects with which the latest academic research has been most concerned: it affirmed that communicators use Twitter to interact with their sources, detect new stories to report, contrast information, talk to their readers and request their cooperation in compiling news articles. In other words, Twitter encourages interactivity.

In order to verify this hypothesis, it was important to know who the communicators were retweeting, who they were answering, which posts they retweeted or who they mentioned. Bearing in mind the size of the sample and its high output, this was an especially laborious task.

The first step was to identify which accounts the communicators in the sample retweeted. To do this, the study examined the ten accounts which were retweeted most by each and every one of the profiles in the sample, without exception, and selected those accounts which had been retweeted by at least two profiles from each newspaper. The subsequent preferences produced an astonishing and unexpected piece of data: 82% of the messages originated from accounts which were found to belong to the newspaper itself or to the same business group and less than 1% of these most retweeted accounts came from outside the profession.

The second variable which was examined were mentions. These are also a significant indicator of interactivity as their purpose is to inform the user who is mentioned that they are being talked about, to agree with something they said or to post a question or comment to them. We were therefore interested in finding out who the communicators in the sample mentioned. The same procedure was followed and once again a striking discovery was made: only 2.52% of these mentions referred to accounts belonging to individuals outside the profession.

Finally, the replies were analyzed, as they are also a valuable indicator of interactivity. We were interested in finding out who the communicators replied to, so the same procedure was followed. Once again, surprisingly, it was concluded that the majority were replies to colleagues, as only 3.68% of the replies were addressed to users unrelated to the profession.

Consequently, the analysis of the indicators of interactivity did not confirm the desired bidirectionality

of the messages and contradicted the assumptions which are made in a large part of the literature on the relationship between Twitter and Journalism.

4.6. The Press and Twitter

The sixth and final hypothesis stated that communicators use Twitter to comment on the information published in the press, enhancing it with new perspectives through links to diverse sources.

The analysis of the tweets, however, would appear to negate this hypothesis, as 70% of the links lead to the pages of the group itself or to the personal blogs of the communicators. There is neither much diversity nor much enhancement.

Nor would it appear that Twitter is used to enhance articles the communicators are writing as the research failed to find any tweet in which the communicators requested information relating to the topics on which they were working. Consequently, there was no evidence of the use of Twitter as a tool which contributes to generating news.

5. Discussion and conclusions

The quantitative analysis of the 40 variables included in this research provides an overall view of how Spanish communicators use Twitter, far beyond the simple self perception of previous qualitative research. The size of the sample, unprecedented to date, means that considerably significant conclusions may be drawn.

Firstly, it can be concluded that Spanish communicators use Twitter (61%), which is perhaps less than expected, especially if we take into account some of the earlier research which claims, as we have mentioned previously, that the platform has been adopted by 95% of these professionals. Bearing in mind that the majority of this research has concentrated on profiles of directors or on profiles of communicators who are specifically related to new technologies, it could be claimed that the use of Twitter by the vast majority of journalists is lower than expected.

What is clear is that the communicators have achieved a degree of influence on Twitter which is above average, especially those whose work combines the written press with audiovisual media. This data may lead us to believe that this influence is not a result of their activity on the networks but of their presence in the traditional media. In any event, it is true that the sample as a whole brings to light averages of influence and presence on Twitter which are slightly higher than those of the average user of the platform.

Moreover, although this above average influence is apparent, there is evidence also of the existence of two «divisions» between the communicators, something like a «two speed Twitter». The continual references the research makes to the median as a statistical measure of central tendency are justified, given that in almost all the variables the average has been perceived as a misleading indicator. This is due to the existence of a leading group which produces extreme statistics which distort reality, statistics with breathtaking figures, typical of celebrities, in contrast to a majority with statistics which were only slightly above the Twitter average.

This leading group, which represents only 5% of the sample, has turned out to be especially productive, as it produced 35% of the tweets which were published daily in the sample. Moreover, if we were to narrow the spectrum even more and reduce it to 1% of the sample, we would discover that this minority absorbs 52% of the total number of times the posts in the sample were retweeted, in other words, these accounts alone produced half of the retweeted messages in the sample.

The second group of communicators, which makes up 95% of the sample, produced much more modest figures. Nevertheless, although it does not reach the rock star statistics of the first group, it is above the average for Twitter users in important variables such as the Klout Score, number of followers,

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number of daily tweets, tweets which have been marked as favourite, retweets, list membership, etc.

However, there is a common denominator between both the leading group and the crowd: both the former and the latter, both the most influential tweeters and the less influential, establish endogamous relationships: they respond to colleagues, retweet colleagues and mention colleagues. Not even the majority of the most influential accounts in the sample can be excluded from this affirmation, with the exception of Professor Dans and, in part, that of the Onda Cero collaborator, Míster Chip.

For the majority of communicators Twitter is just another, rather unidirectional, traditional medium. Hence, the belief that its use has modified the paradigm of communication or its practices is a fallacy, or the expression of an aspiration.

This affirmation allows us to conclude that for the majority of communicators Twitter is just another, rather unidirectional, traditional medium. Hence, the belief that its use has modified the paradigm of communication or its practices is a fallacy, or the expression of an aspiration, no matter how much the idea abounds in the academic literature on the subject and how much communicators themselves hold this self perception, as is evident in some of the aforementioned research. Much has been written on the participation of users in the information reporting process and the effects of this participation on communication models and, in general, our life as a society, as well as other similar and undoubtedly interesting and significant phenomena; but these reflections are not always based on sufficient empirical evidence and rather frequently respond to a perspective which could be called cyber-utopian.

On the contrary, according to the data produced by our research, it could be deduced that the recent adoption of the service has seemingly affected only the medium, the mantle, the dissemination of the messages, but not the origin or the destination of the information, and far less the processes whereby it is produced.

Although the new tool offers unquestionable attractions as it is fast, it detects trends and is a source of information, there is no indication that it has come to be an instrument of communication for the public, in which professionals and non professionals participate in creating news. The reality is this: with some exceptions, the interactivity afforded by Twitter is not being used to full advantage.

These affirmations, obviously, should not be generalized as the research also verified that some profiles show a high degree of interactivity, although these are a minority and not statistically significant. Nor should these conclusions question the use and benefits of the service, which has adjusted very well to the practices of the profession. But the data is conclusive.

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Internet and Emotions: New Trends in an Emerging Field of Research

Internet y emociones: nuevas tendencias en un campo de investigación emergente

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ABSTRACT
Emotions have become increasingly important in our time, in all realms of social reality. This revaluation of the affective dimension of the person is revealed in its common presence as subject of research in many fields of knowledge. Also in Media and Communications studies, and specifically in relation to the use of digital technology, there is an academic interest in emotions. This paper maps the field of study where emotions and digital technology converge, specifically in the use of the Internet. There appears a vibrant, wide and complex field of study in which come together approaches of different types, both on the theoretical plane and on the methodological one. The article provides an overview of research carried out in this subject, which includes the study of social media as spaces of interaction where emotions are displayed, the massive-scale emotional contagion or the sentiment analysis in the digital platforms, among other topics. We conclude that the Net not only arouses emotions in users and serves as a channel for the expression of affection, but also influences the way in which this affection is modulated and displayed, as well as the configuration of the personal identity of the users of the Internet.

RESUMEN
Las emociones han adquirido una importancia creciente en nuestra época, en todos los ámbitos de la sociedad. Esta revalorización de la dimensión afectiva de la persona se ha reflejado, a su vez, en su inclusión como objeto de estudio en investigaciones de numerosas ramas del saber. También dentro de los estudios en Comunicación, y en concreto en relación con la tecnología digital, existe un interés académico por las emociones. Por medio de una profunda revisión bibliográfica, en este trabajo se traza un mapa del campo de estudio en el que convergen las emociones y la tecnología digital; más concretamente, en el uso de Internet. En él se advierte un campo de investigación vibrante, amplio y complejo, en el que confluyen aproximaciones de diferente tipo, tanto en el plano teórico como en el metodológico. El artículo presenta un panorama de las investigaciones realizadas en esta materia, que abarca desde el estudio de las redes sociales como espacios de interacción en el que las emociones son expresadas, el contagio emocional a gran escala o el análisis de sentimientos en las plataformas digitales. Se concluye que la Red no sólo despierta emociones en sus usuarios y sirve de cauce para la expresión de los afectos, sino que también influye en el modo en que dicho afecto se modula y despliega, así como en la configuración de la identidad de la persona.

KEYWORDS | PALABRAS CLAVE
Emotion, Internet, technology, emotional contagion, emotional identification, social networks, multiscreen society.
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1. Introduction

Unlike previous eras, where the affective dimension of the person was usually left in the background and confined to the context of private life, today we are immersed in a strong emotional culture, one that permeates all realms of social life (Bendelow & Williams, 1998). Although throughout the Western tradition the reflection about the nature of human affection has always been present –from the writings of Aristotle, and more recently in Descartes, Spinoza or William James and others (Solomon, 2003)– an «affective turn» has taken place also in academia in recent decades (Clough & Halley, 2007), in the sense that emotions have become the object of study of different scientific disciplines (such as anthropology, economics, linguistics, computer engineering, etc.). Moreover the progress made by neuroscience has contributed to highlight the role that emotions have in mental processes and their importance in the development of brain functions (Ferrés, 2014).

There are, therefore, various theoretical approaches on emotions, which are conceptualised and explained both from neurobiological and sociocultural approaches. In this regard, it should be noted that it does not seem feasible to understand emotions, their experience, expression and communication without taking into consideration the social context in which they are manifested; consequently, one of the most fruitful theoretical approaches is the one developed from the «sociology of emotions» (Turner & Stets, 2007). Conversely, the complex reality of this facet of human nature makes it an object of interdisciplinary study, albeit one about which there is still no comprehensive vision, capable of bringing together and integrating all these different disciplines. There is also no conceptual and terminological consensus about phenomena covered here, such as affection, emotions, feelings or passions.

Parallel to the rise of the affective dimension in social life and in academia in the last two decades, we have also witnessed the growing social acceptance of Information and Communication Technology (ICT). Technology is fully integrated into our daily lives and the adoption, pervasiveness and ubiquity of digital devices are not a mere quantitative issue, because their «wide distribution, customization, and the possibility of permanent connection that they create, contribute to reconfigure various aspects of everyday life and of processes of contemporary subjectivation and socialization» (Lasén, 2014: 7).

There is no doubt, therefore, that today people relate in both offline and online environments; furthermore, social relations are already hybridised into both contexts. At the same time, the digital realm has its own peculiarities, which come from its electronic nature, and that in turn affect the emotional dimension of the person. The traditional social life, which is slower and localised, coexists with the (faster and uprooted) digital social life. Thus, these are two space-time regimes; and each is accompanied by a corresponding emotional regime. The technological emotional regime is primarily a regime of emotional intensities, in which the amount of emotion matters, while in the traditional regime, it is primarily a regime of emotional qualities. Although it does not seem feasible that the technological regime may someday nullify the traditional regime –since the latter is the condition of possibility of the former– it is indisputable, however, «that the coexistence of both emotional regimes generates interference between emotional logic of each system» (González, 2013: 13-14). Such coexistence, moreover, makes the field of analysis of digital technology and emotions broad and complex, as it is to address the implications derived from it both in physical and in the digital world.

2. Material and methods

From a historical perspective, we can say that the relationship of the western world with technology has always been highly emotional. Since technology is always in the realm of novelty, its emergence opens the question of how the new flows into the old, of what is known. This process, as noted by Fortunati and Vincent, «is played in a binary way between the pole of curiosity, rarity, new risk and uncertainty on the one hand, whilst on the other it includes old habits, stability certainty, security and safety» (2009: 6). Additionally, there is the series of meanings, symbols, values associated with technology. Therefore any technological innovation, especially in the beginning, raises a debate between enthusiasts and sceptics or, to put it in terms of Umberto Eco, between «the apocalyptic and the integrated» (Eco, 1964).

Nowadays the coexistence, on one hand, of the growing importance of the affective dimension in social life and, on the other hand, of the role acquired by technology and particularly Internet in everyday interactions, has allowed the field of research at the intersection of both realities to become very abundant and varied. This is true both in terms of theoretical frameworks and methodologies, and in the issues, emotions, social groups or specific technological devices that are the subject of the various studies and publications to this day.

The goal of this paper is to provide, within media and communication studies, an overview of the field of research on Internet and emotions, showing the different areas of study and the most relevant authors and publications in each of them. It´s beyond the scope of this paper to discuss studies focused on the emotional investment that people put in digital technology, especially mobile phones.

Through a comprehensive literature review, I will map this field of research in the following pages. To do this, I will take as reference the academic literature that has explicitly explored emotions in relation to the new field of socialization and emotional projection that is the Internet. First I present a framework with the main theoretical and methodological issues involved in the study of the Net, and have been faced from different disciplinary traditions. Next, I will explore in more detail the expression of emotions in social networks, both at micro level (of interactions between users) and at macro level (the phenomenon of emotional contagion, also known as emotional identification in the field of neuropsychology).

important demographic information about the authors of the data such as gender, education or online behaviour» (2014: 6).

This unique character of the Internet as an object of study in relation to emotions has produced abundant and varied literature. Without taking into consideration the studies on the search for affective relationships through Internet (love, as the emotional state par excellence, has been examined in the digital dimension (Ben-Ze'ev, 2004; Kaufmann & Macey,

> The technological emotional regime is primarily a regime of emotional intensities, in which the amount of emotion matters, while in the traditional regime, it is primarily a regime of emotional qualities. Although it does not seem feasible that the technological regime may someday nullify the traditional regime –since the latter is the condition of possibility of the former– it is indisputable, however, «that the coexistence of both emotional regimes generates interference between emotional logic of each system».

3. Analysis and results

3.1. Theoretical and methodological issues

The analysis of the online realm as a space in which emotions are activated and expressed is an extensive and complex area, as it encompasses many different phenomena and congregates studies from different theoretical trends and disciplines. As Benski and Fisher point out, the Net is a unique laboratory for the analysis of emotions for two main reasons: «First, the Internet is a fertile ground for a huge diversity and amount of communication of all sorts and from a large and diverse group of people. Much of that communication is emotional, reflecting immediate feelings, sometimes as they occur –most use of social media such as Facebook and Twitter is now occurring on mobile devices. Second, these communication acts are all registered (…) When communication data become available, it is relatively easy to analyze since it is likely to be relatively complete and includes meta-data such as time and location, and at times other pieces of

2012), some studies focus on the analysis of a particular emotion, such as:

- Empathy (sympathising with the tragedies of others, producing videos on YouTube) (Pantti & Tikka, 2014).
- Annoyance (which children and adolescents admit to experience when they find inappropriate content on the Internet) (Livingstone & al., 2014).
- Envy or jealousy (when reading Facebook status updates of contacts) (Muise, Christofides, & Desmarais, 2009; Sagioglou & Greitemeyer, 2014).
- Resentment (of workers in precarious job, who let off steam in the forums) (Risi, 2014).
- Hope (that fosters interactions on dating websites) (Fürst, 2014).
- Hatred (often under anonymous cover that the Net can provide) (Perry & Olson, 2009).
- Grief or mourning expressed online when a loved one dies (Walter & al., 2012; Jakoby & Reiser, 2014).

There are studies that focus on the expressive

capabilities of a particular channel of communication such as Skype (Chiyoko-King-O'Riain, 2014) or email (Kato, Kato, & Akahori, 2007); while others focus on specific groups whose activities have a strong emotional charge, such as feminists (Reestorff, 2014), political activists (Knudsen and Stage, 2012) or migrants (Fortunati, Pertierra, & Vincent, 2012). From the point of view of disciplinary traditions, digital emotions have been approached from Cultural Studies (Karatzogianni & Kuntsman, 2012), Screen Studies (Garde-Hansen & Gorton, 2013), Digital Literacy (Moeller, Powers, & Roberts, 2012), Domestication of Technology (Schofield-Clark, 2014), Risk Studies (Roeser, 2010) or Queer Studies (Cefai, 2014), among others.

Becoming aware of the capabilities of the digital realm as a space and channel for the expression of emotions involves considering the Internet and its applications not as an instrument that we use, but as a place of experience and subjectivity; rather than a means of communication it is a space that we inhabit and that it inhabits us.

As noted above, the aim of this paper is to map the state of the field within Media and Communication Studies. Therefore, we will not dwell on works that discuss the subject from other approaches such as Engineering and Computer Science. In this regard, we simply indicate the importance of Affective computing, where computer science, psychology and cognitive science converge, and which studies how to design computers that are able to recognise, interpret and even simulate emotions in order to improve interactions between people and computers (Picard, 2003). Also from an approach of computational linguistics, sentiment analysis is increasingly gaining importance, that is, the type of sentiment (positive, negative or neutral) that a person might feel or try to express when writing some information, and which in the digital realm is applied especially in social networks like Twitter or Facebook.

Two of the background theoretical issues that mark the debate about emotions in the online realm, in both Media and Communication Studies and related disciplines, are: first, how emotions can emerge and be measured in the Internet (Küster & Kappas, 2014) and, second, the differences and similarities between the expression of emotions in face-to-face relationships and relationships mediated by digital technology (Boyns & Loprieno, 2014). Regarding the first, there are «three areas of emotions measurement, each requiring its own unique methods, and each revealing a different facet of the intersection of the Internet and emotions. First, we can investigate large amounts of emotional content readily available online (through qualitative or quantitative content and data analysis). Second, we can inquire into the subjective emotional experience of users (using self-reporting, through interviews or questionnaires). And third, we can record bodily responses indicating emotional states in real-time Internet use» (Benski & Fisher, 2014: 8).

In terms of emotional expression in computer-mediated interactions, we must start from the realisation of the peculiarities of the digital environment, where there is no corporeality that accompanies physical relationships, and the communication between participants is not necessarily synchronous. Since affection has a bodily foundation and it is more difficult to control emotions face to face, the absence of both factors might lead one to believe that the digital realm is emotionally colder, and that it impairs or restricts the expression of emotions. However, in an extensive literature review on this issue, Derks, Fisher and Bos (2008: 780) conclude that «CMC is not characterized by a lack of emotions, on the contrary (…) positive emotions are expressed to the same extent as in F2F interactions, and that more intense negative emotions are even expressed more overtly in CMC».

When the interaction mediated by technology is textual and not visual (and therefore there are no nonverbal cues, which are certainly an element of richness for the expression and interpretation of the affective dimension), Internet users can offset such absence by using emoticons (Jibril & Abdullah, 2013). If the digital interaction through video, and there is therefore mutual facial recognition, expression and interpretation of emotions becomes –in principle– easier (Kappas & Krämer, 2011). Indeed, each of the technological devices, applications or communication channels (video call, instant messaging, etc.) carries with it

a particular «affective bandwidth» (Lasén, 2010), i.e., they allow certain amount of emotional information to be transferred. In this sense, the Internet in turn encompasses different socio-technical environments that allow emotions to surface in varying degrees; therefore, the affective dimension is not revealed equally in all interactions and communicative situations taking place in the Net. There are, therefore, some «emotionality factors» (Gómez Cabranes, 2013: 219-223), such as:

- The expressive possibilities of each of those environments (it is not the same if it is a blog, a chat, a social network (and which one in particular), etc.
- Themes and topics around which the interaction revolves.
- The context and purpose of use of people.
- The degree of anonymity or self-revelation in interactions.
- The investment of time or frequency with which users connect to the digital domain.

Thus, although the digital emotional regime is primarily a regime of emotional intensities, these do not occur equally in all applications and contexts of the digital environment, but they are conditioned by the above factors, among others.

3.2. Emotions in social networking sites

Becoming aware of the capabilities of the digital realm as a space and channel for the expression of emotions involves considering the Internet and its applications not as an instrument that we use, but as a place of experience and subjectivity; rather than a means of communication it is a space that we inhabit and that it inhabits us (Lasén, 2014). This is especially evident in, but not limited to, social networks, which are specifically designed to create and maintain links with others, making these sociability platforms one of the most representative examples of Web 2.0. The way in which this design is realised is not an emotionally iniquitous decision, but it conditions the expressive capacity of the user. Such is the case, for example, of Facebook and its single «Like» button, preventing users to express other negative feelings (dislike, anger, grief, etc.) as easily (Wahl-Jorgensen, 2013). The implications of this «emotional architecture of social media» transcend this context, because (as clearly argued by Peyton, 2014), the notion of «liking» has experienced a semiotic change, as it has moved from the intimate and emotional realm of individuals into the public realm. Rather than a feeling, it is now is an action, since «instead of being tied to an internal sensation that reacts tacitly to an external stimulus, to 'like' now becomes a conscious rationalized action that connotes an external tag of connection between an individual, a discursive element, and a social stance» (Peyton, 2014: 113).

Within the digital realm, the emotional dimension is closely linked to the configuration of the identity of the person. In social networks, it is worth noticing in the processes of recognition and status negotiation, because as Svensson points out «the more someone links to you, likes you, thumbs up your postings, and comments on them, etc., the higher you will be ranked and listed in the different SNS, news feeds, and tables of suggested links and readings (...) That increase in status is linked to feelings of satisfaction and well-being. Indeed, positive emotions emerge when individuals are able to reaffirm their self-conceptions» (2014: 22). Emotions online are in this way used as resources in the identity work of the user; in a digital medium, marked by interconnectivity and where the person cannot reaffirm self-conceptions without being visible for others.

Moreover, if we consider the habits of news consumption, it is easy to observe that emotions are also on the basis of the act of sharing content and news in the digital environment (Hermida, 2014). Although the emotional component has always been present in the use of mass media and how people process different media messages, whether news or fiction, the novelty is that today, on platforms such as Twitter, the timeline on certain events of political or social nature is a mixture of information, opinion, interpretation and emotions, repeated and amplified by the network itself, giving rise to what Papacharissi (2014) qualifies as «affective news streaming». As seen in the case study of the resignation of Hosni Mubarak as president of Egypt in February 2011, «prominent and popular tweets were reproduced and endorsed, contributing to a stream that did not engage the reader cognitively, but primarily emotionally. Frequently, the same news was repeated over and over again, with little or no new cognitive input, but increasing affective input» (Papacharissi & Oliveira, 2012: 278).

3.3. Emotional contagion

As noted above, the Internet allows researchers to investigate huge amounts of content readily available online. Since sharing emotions is essential for creating and maintaining social ties, somehow the status of social networks revolves around the emotions and feelings that users express about themselves, but at the same time find resonance among their circle of contacts. Therefore, other areas of abundant research and

growing importance are those related to the study of emotional contagion through social networks and the viral spread phenomenon.

Recently, in a controversial experiment carried out by researchers from Cornell University with the assistance of Facebook programmers (Kramer, Guillory & Hancock, 2014), the feed of 690,000 users was manipulated for a week. A user group received positive news, while another group were given news full of negative connotations. One of the conclusions was that people who watch less negative stories in their feed are less likely to write a negative post (and vice versa). The study indicates that emotions expressed by others through Facebook influence the emotions of the user; and that for emotional contagion to occur, face-to-face contacts (with non-verbal cues that accompany such interaction) are not essential.

Another research has analysed a period of over two years the status updates on Facebook of about one million users; also noting that both negative and positive posts had some impact on other members of their social circles. The peculiar characteristic of this research is that, starting from the premise that atmospheric phenomena can influence mood, they analysed the correlation between weather reports from different cities and the status updates of users who live in them, and confirmed that on rainy days the number of Facebook posts containing positive expressions declined 1.19%, while the negative posts increased by 1.16%. According to the authors, «For every one person affected directly, rainfall alters the emotional expression of about one to two other people, suggesting that online social networks may magnify the intensity of global emotional synchrony» (Coviello & al., 2014). Ultimately, the research on this subject concludes that the decision of users to update their status is influenced by what happens to their contacts in their social circle.

Large-scale emotional contagion in the digital realm has another focus of interest in the viral spread of content. This is one subject that has been researched especially in the field of advertising and marketing (Dobele & al., 2007; Eckler & Bolls, 2011) where the authors agree that generating emotions –and among these, especially surprise and joy– is a requisite so that a video can be shared in the digital realm. As explained by Dafonte, «the decision to share a viral video is caused, on the one hand by motivations that have to do with the psychological or emotional needs of the user potentially sharing the clip, and on the other, with the motivations related to the viral video itself. The decision to share a viral video ad stems from the meeting of both these spheres in the individual» (2014: 202).

Beyond the strictly advertising realm, there is increasing attention being paid to the phenomenon of memes, that is, contagious images, videos and ideas that circulate virally on the Internet, mobilising the emotions of users both horizontally (through blogs, YouTube, Facebook, Twitter) and vertically, when traditional media also echo the emotional resonance they acquire. Understanding and attempting to predict the dissemination process of this type of content has been analysed by scholars (Sampson, 2012; Spitzberg, 2014).

4. Discussion and conclusions

The popularisation of digital technologies has made them a constant presence with the person; so much so that the sensory contact is the first step to elicit an emotional relationship between the user and the device. The digital sphere –the realm that is accessed through the screens– is also a space where the affective dimension of technology users emerges and is expressed. In other words, Internet is an «affective technology», in the sense that it is a channel for the expression of emotions and it participates in the constitution of subjectivity of the individual. It enables the fixing of emotions, transforming them into «digital inscriptions» (Lasén, 2010), into objects that can be stored, managed, viewed, compared, shared, etc.

An approach from the point of view of emotions, understood as a predominant value of contemporary society, allows us to map, as I have done throughout these pages, a vibrant, broad and complex field of research as part of Media and Communications Studies, where different theoretical approaches converge: from digital literacy to cultural studies, through film and gender studies. Whether at the micro level of interactions across different platforms (social networks, blogs, forums, etc.) and macro (through large-scale emotional contagion), it is clear that Internet not only arouses emotions in users and serves as a channel for the expression of affection, but also influences the way in which this affection is modulated, played out and displayed. From the methodological viewpoint, the challenge of combining qualitative and quantitative techniques to measure and compare emotions in the offline and online worlds still remains.

The convergence of the face-to-face and digital realms (with their respective time-space and emotional regimes), socio-cultural practices associated with the use of technology (along with the technical, legal and market-based conditions), the variety of technological

devices (with different emotional potential) or the peculiarities of computer-mediated interactions versus face-to-face contact are some of the issues that articulate the studies on this subject. In this sense, the contributions of research from neuroscience continue shedding light for a more accurate understanding of emotions.

Finally, the recent emergence of wearable devices –which is a step closer towards the bodily adaptation and integration of technology into the user–, advances in the design of social robots (facilitating a more 'natural' interaction with humans) and the growing expansion of the so-called 'Internet of things,' which are making the presence of technology in daily life more ubiquitous and immersive, are some of several future lines of research that emerge as subjects of interest in the study of emotions in the use of digital technology.

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European Newspapers' Digital Transition: New Products and New Audiences

La transición digital de los diarios europeos: nuevos productos y nuevas audiencias

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ABSTRACT

The adaptation of traditional newspapers to new digital media and its interface, far from being a mere technical transformation, has contributed to a gradual change in the media themselves and their audiences. With a sample including the top general information pay newspaper in each of the 28 countries of the European Union, this research has carried out an analysis using 17 indicators divided in 4 categories. The aim is to identify the transformations that the implementation of digital media have brought to the top European newspapers. In general terms, the results show that most dailies have managed to keep their leadership also in online environment. Moreover, an emerging group of global media is growing up, based in preexisting national media. Digital and mobile media have contributed to the appearance of new consumption habits as well, where users read more superficially and sporadically. The audience uses several formats at a time, and digital devices already bring the biggest amount of users to many media. The Internet-created new information windows –search engines, social networks, etc. –are also contributing to the change in professional work routines.

RESUMEN

La adaptación de los medios de comunicación tradicionales a los nuevos soportes digitales y su interfaz, lejos de constituir un mero ajuste técnico, ha contribuido a una paulatina transformación de los propios medios y sus audiencias. En una muestra integrada por los diarios de información general y de pago líderes en los 28 países de la UE, y mediante el análisis de 17 indicadores distribuidos en cuatro categorías, este artículo busca identificar las transformaciones que la implantación de los soportes digitales han provocado en las principales cabeceras de la prensa europea. En términos generales, los resultados de la investigación señalan que la mayoría de los diarios no sólo han logrado mantener su liderazgo en la Red, sino que en algunos casos también se está alumbrando un incipiente conjunto de medios globales a partir de medios nacionales preexistentes. Los soportes digitales y móviles también han favorecido la aparición de nuevos hábitos de consumo, caracterizados por una lectura más esporádica y superficial por parte de los usuarios, y han configurado una audiencia que ya en muchos casos es multisoporte, y donde los dispositivos digitales aportan ya la mayoría de lectores a muchos medios. Asimismo, las nuevas ventanas de acceso a la información –buscadores, redes sociales, etc.– generadas por Internet, también están contribuyendo decisivamente al cambio de las rutinas y las formas de trabajo de los propios medios.

KEYWORDS | PALABRAS CLAVE

Journalism, audiences, cybermedia, digital communication, multimedia contents, design, multiple screen society, Internet.
Periodismo, audiencias, cibermedios, comunicación digital, contenidos multimedia, diseño, sociedad multipantalla, Internet.

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1. Introduction and state of affairs

Since the appearance of the first Internet media two decades ago, theoretical discourse about its development have ranged from technological determinism to constructivist approaches. In the first end (Mosco, 2004; Boczkowski, 2004), the media analysis focused on trying to anticipate the «communicative utopias» and the revolutionary changes that the development of the full potential of the Internet would produce in the communication system and journalism, on the basis that all technological innovation inevitably causes social change (Paul, 2005; Domingo, 2006). However, approaches centred on the way audiences and professional journalists' routines have interacted with technical advances have offered a vision in which, far from pre-established developments, production practices, new formats and technological tools have opened the discussion and have shaped one another (Deuze, 2001; Schmitz & Domingo, 2010).

The emergence of Web 2.0 –focused on the development of applications and websites that allow users to create, distribute and share content– has contributed to the creation of what Jenkins (2006) calls a «culture of convergence», where the long separation between content creators and their audiences has begun to dilute, although, as concluded Steensen (2011), it may be considered that the traditional notion of «gatekeeping» is still in full force and assumed by the media.

Beyond the role of the audience, digitalization and leap to the web continue to lead profound changes in the media landscape, ranging from content production to work routines, media, distribution strategies and business models (Casero-Ripollés, 2012).

Faced with statements predicting the demise of paper as printed media (Martinez-Albertos, 1997; Meyer, 2004), newspapers have had to face a significant drop in advertising investments and dissemination, so digital media appears to be a great alternative for the future of print journalism (Armentia, 2011).

This necessary adaptation to the new digital media can be understood, on the one hand, from a purely technical aspect, which refers to the adequacy of editorial content of cyber media on new information devices (smartphones, tablets, etc.) (Meso, Larrondo, Peña, & Rivero, 2014). But this transition is not limited to a change in format, but rather has contributed to a deeper transformation in the configuration of the media.

Unlike print journalism, which has very definite design techniques result of technological and formal evolution of the medium itself over decades, digital newspapers were born with a very simple and vague visual composition, which has evolved into a certain visual uniqueness, far from the nuances of the daily paper (Lopez, 2012). As defined by Rodriguez-de-las-Heras (1991) –unlike paper– screen is not only a surface, but rather a place of contact between the two areas where the manner of working gives the interface as a result.

The screen is, in effect, a space that integrates the different types of information and a socialising forum where virtual communities are created. As Díaz-Noci (2009) notes, in new digital media both product media and the reading strategy are dynamic, and websites are representations and constructions of the information the reader, through active intervention, recovers in a certain way, making use of an interface. The reader develops reading strategies such as tracking, searching, exploring or wandering, and waiting for the search for information to establish a dialogue with other texts, thus going from hypertextuality to intertextuality.

2. Material and methods

This research aims to identify the main transformations that development and implementation of digital media has provoked in the top European newspapers. In relation to this general objective, the following hypotheses are specified:

- H1: The main European media groups have succeeded in carrying over their leadership from print to screen, and they have also become noteworthy in diverse digital media.
- H2: Based on existing traditional newspapers, online newspapers have generated new consumer habits and new audiences.
- H3: The consumption of digital media shows a tendency towards a cross-media usage, in which now only a small proportion of the total audience comes from print editions.
- H4: The new digital media contain specific characteristics that have transformed the structure and the design of the media.

The sample utilised to carry out the study is comprised of the leading general information newspapers sold in each of the 28 countries of the European Union. For their identification, the broadcast data audited by the agencies belonging to the IFABC (International Federation of Audit Bureaux of Circulations) was used and have been completed with information provided by the European Journalism Centre and Eurotopics.

The final list of the media analysed, classified by order of greater to lesser circulation is the following:

«Bild» (Germany), «The Sun» (United Kingdom), «Kronen Zeitung» (Austria), «Ouest-France» (France), «De Telegraaf» (The Netherlands), «Corriere della Sera» (Italy), «Fakt Gazeta Codzienna» (Poland), «Helsingin Sanomat» (Finland), «El País» (Spain), «Aftonbladet» (Sweden), «Blesk» (Czech Republic), «Slovenske Novice» (Slovenia), «Het Laatste Nieuws» (Belgium), «Blikk» (Hungary), «Click» (Romania), «Correio da Manhã» (Portugal), «Irish Independent» (Ireland), «24 Sata» (Croatia), «Nový Cas» (Slovakia), «Politiken» (Denmark), «Luxemburger Wort» (Luxemburg), «Trud» (Bulgaria), «Postimees» (Estonia), «Latvijas Avize» (Latvia), «Lietuvos Rytas» (Lithuania), «Ta Nea» (Greece), «Times of Malta» (Malta) and «Philelefheros» (Cyprus).

Following to the proposed hypotheses, the following categories have been established in order to carry out a descriptive statistical analysis, in accordance with the cybermetrics guidelines described by Alonso, García & Zazo (2008) and Rodríguez, Codina & Pedraza (2010):

a) Popularity and area: number of visits (visitors in the past six months), position in the national ranking, percentage of national traffic and geographic distribution of visits.

b) Reading habits: average time per visit, pages visited and «bounce rate» (users who spend less than 30 seconds to visit the website).

c) Cross-media: applications for mobile devices (Android and Apple).

d) Structure of consumption and design: direct access to the URL, access from links on other websites, search engines, social networks and number of followers in each (Facebook and Twitter), email and visits from sponsored links. For categories a), b) and d), data was used obtained through specialised websites Alexa and SimilarWeb in April 2015. The estimates provided are checked against the data audited by IFABC (2013), ComScore and OJD Interactive to ensure that, regardless of its accuracy, they have the validity needed to establish comparative studies. For the third category of analysis has been performed a quantitative analysis of the applications published by the publishers of newspapers in Google Play and App Store. Finally, in the fourth category of analysis, the data provided by social networks was incorporated (Facebook and Twitter).

3. Analysis and results

3.1. The online leadership of traditional European press

The study conducted supports the conclusion that the popularity and attractiveness of the traditional newspapers remains an important asset for the online media. Of the 28 newspapers analysed, all of them leaders in national circulation in their print edition, 18 (64.3%) also managed to make a place among the three most consulted media on the Internet in their respective countries. The consolidation of this leadership is even more remarkable considering that all of them must compete with media arriving from other formats (television, etc.) and also with native media created, in

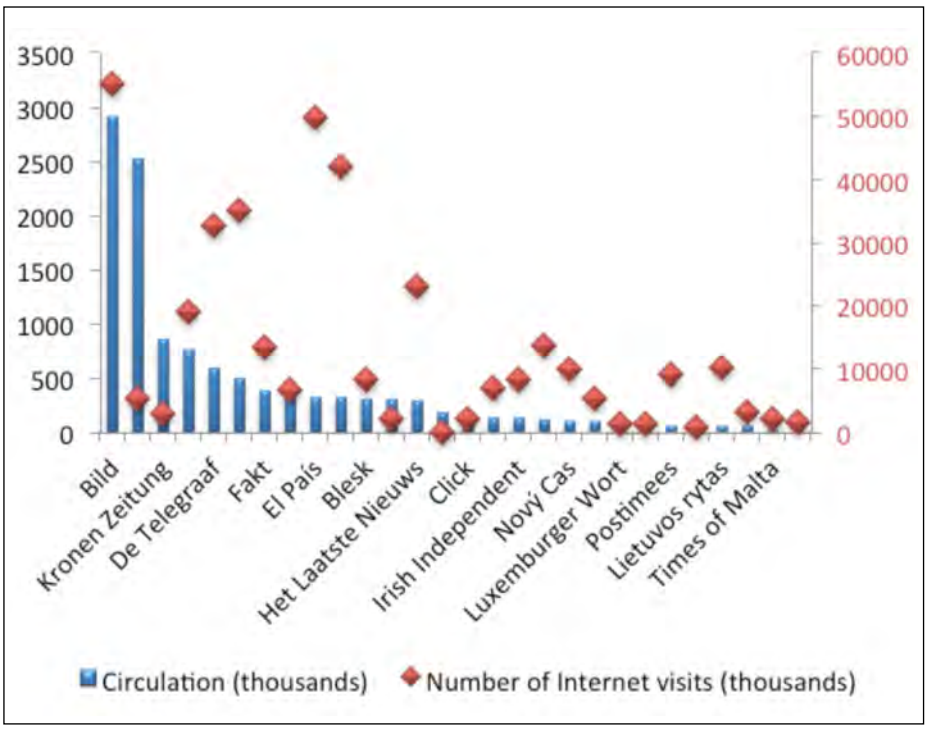

Figure 1. Circulation and Internet audience of main European newspapers.

some cases, by large telecommunications companies. Therefore, the greatest weight in the consumption textual information on the Internet favours a predominance of printed media source in the panorama of European online media.

The list of the media that do not manage to transfer their position of dominance to the Internet (one in every three) also lends itself to some significant interpretations, as it includes some of the newspapers with the greatest print circulation figures in this study.

On the one hand, the sensationalist «The Sun» is an excellent example of the change in business model of digital newspapers, whereby the maximization of readership numbers is foregone in favour of constructing a community of digital subscribers (Arrese, 2015). Since the beginning of its adoption of a paywall, created in August 2013, «The Sun+» offers information packages at a price of two pounds Sterling per week, which give access to all the newspaper content and to specific mobile applications. With more than 225,000 subscribers, this business model –also used by «The Times»– is one of the most successful among communication companies.

The case of the French daily «Ouest-France», on the other hand, points to another change in the models of success among online newspapers. Sales of the print edition of this regional newspaper edited in Rennes – 733,000 copies daily in 2014 – double those of the main national newspaper, the conservative «Le Figaro» (OJD, 2014). However, the «Ouest-France»'s positive Internet data are not enough to assure its dominance, and its number of visitors hardly amounts to half of those achieved by nationwide publications like «Le Monde», «Le Figaro» itself, or the sports paper «L'Equipe». These differences worsen in the case of other newspapers in the booming regional French press, like «Sud-Ouest», «La Voix du Nord» or «Le Dauphiné Libéré», and are also extended to other markets, such as in Spain, where leading local and regional newspapers such as «La Voz de Galicia», or «El Correo» find that native web-based media of short lifespan such as «El Confidencial», «Libertad Digital» or «Público» manage to achieve comparable numbers of visits.

3.2. New habits, new audiences

The process of gradual expansion of the areas of circulation has also favoured the incipient appearance of new global communication media and new markets. Beyond the traditional boundaries of press circulation, the Internet has made it possible for the media to reach very considerable audiences in markets that were previously residual. Against an almost exclusively national consumption of their traditional media, the leading European newspapers receive 22.9% of their online visits from abroad.

Diverse factors influence the global consumption of media whose character is, at least initially, national, regional or local. Firstly, areas of linguistic influence mean that political borders can be overcome, which facilitates, for example, a significant number of visits to the sensationalist German «Bild» from other German-speaking countries, such as Austria or Switzerland where it numbers among the most visited media.

Digital media audiences also cause the cultural and historical links that blur political borders to flourish. As such, it is not surprising that the tabloid «Blesk», the Czech version of the Swiss tabloid «Blick», receives over 10% of its readers from neighbouring Slovakia, or that 8% of readers of the Estonian paper «Postimes» visit the site from Finland.

In addition, the impact of emigration is not to be ignored; in some cases emigrants can account for a significant number of visits to the important communication media of their home countries. Sizeable communities residing abroad explain, for example, why the Cypriot «Philelefteros» receives almost 30% of its visits from Greece and the UK –principal destinations for its large emigrant community–, or why almost 20% of readers of «Irish Independent» come from the USA, and 13% from the UK.

These frequently overlapping linguistic, historical and migratory factors are contributing to the progressive dilution of the traditional correspondence between the politico-administrative borders and the distribution of communication media. As a result, this newfound audience profile is gradually giving rise to new global media.

Throughout history there has certainly been no lack of media of international vocation. The BBC, which currently provides information in 32 languages via its website, has been an excellent example for decades. The press has not been immune to these products, and the «International New York Times» (formerly the «International Herald Tribune») still sells 220,000 copies in 180 countries (The New York Times, 2014).

However, the Internet has meant that some media have transcended their national character to gradually become global media as a result of gradual internationalisation. An excellent example of this transformation is the centenary British tabloid «Daily Mail», whose online audience has little to do with what might be expected of a sensationalist and conservative British

tabloid. On the contrary, the «MailOnline» has established itself as a genuine global medium, in which only 17.6% of its visits from the United Kingdom. Significantly, the newspaper founded by Alfred Harmsworth receives twice the number readers from the United States than from the UK (34.2%), and reaches on the other side of the Atlantic the second place between the most read traditional newspaper on the Internet, only behind the «The New York Times» and ahead of national newspapers like «USA Today», «The Washington Post» or «The Wall Street Journal». The newspaper also occupies a place of honour in countries like Australia, Canada, the Philippines, India, Ireland, New Zealand, South Africa and Singapore, among many others.

The case of the «Daily Mail» is probably one of the most striking, but not the only one. «The Guardian», for example, has also suffered an online transformation that is no less revealing. The 185,000 copies sold for the paper edition of this almost 200-year-old English newspaper do not allow it to take a place among the ten most popular newspapers in the UK press, dominated by the tabloids, while reference newspapers in the conservative court like «The Daily Telegraph» and «The Times» double its circulation. Online, however, it rises to second place among British newspapers though, as with the «Daily Mail», only one in five of its readers (19.4%) come from the islands. Its main market is also United States (33.9%) and it has a large number of readers in other English-speaking countries.

This growing internationalisation, which contributes to the creation of new global media from pre-existing national media, is not unique to the Anglo-Saxon field. In Spain, two leading Internet media sites, «El País» and «Marca», have one in three visitors from other countries, mainly in Latin America (35.9% and 34.4%, respectively). In the case of «El País», this transformation has led to a mutation in the identity of the medium itself, with the change in October 2007 from its original slogan «Independent morning newspaper» to «Global newspaper in Spanish». Since the inclusion in November 2013 of an online edition in Portuguese for Brazil –which added to the pre-existing generic for America– the caption was abbreviated to «Global newspaper».

3.3. Multi-format digital media consumption

If the Internet has had a big impact when it comes to blurring the boundaries in the distribution of content and to creating new global media, the extended use of mobile devices, such as smartphones and tablets, and the mobile Internet broadcast signal, have meant that all media, and the major European newspapers by extension, have found powerful allies to increase their audiences in the new media, a «fourth screen», favouring a distribution alternative for their messages (Aguado & Martinez, 2009).

These formats, far from being a mere supplement to the audience of newspapers in their traditional medium, in some cases constitute the main source of influx of readers. The case in the UK is a clear example thereof. According to the latest data from the comprehensive National Readership Survey (2014)[1], 62.6% of the readers from the eight major newspapers of the British press access newspaper information from their personal computers and mobile devices. Particularly significant is the case of «The Guardian», with a total audience of only 9% who read only the printed version, similar to the figures also shown by «The Daily Telegraph» or «The Independent». At the other end still remain «The Sun» and «The Times», whose rigid commitment to paywalls on the Internet and mobile devices causes four out of five of its readers only read print editions.

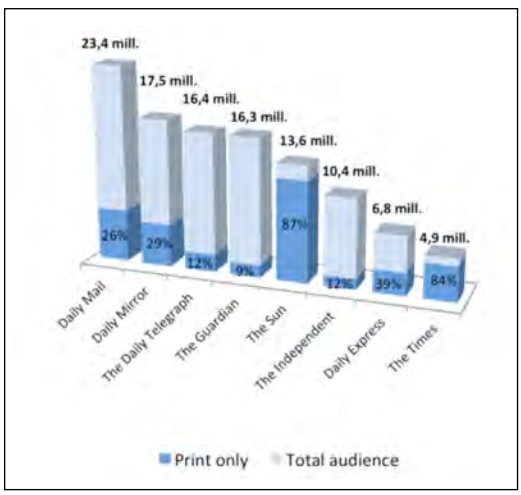

Figure 2. Audience of British newspapers.

The analysis of data from British newspapers, similar to the report from the Pew Research Center (2015) providing data on the American press, clearly shows a gradual transformation of newspapers on multiplatform products, which are consumed together and interchangeably through various media (paper, computer, mobile devices).

This new source of influx of readers has promoted a tendency in favour of applications for mobile devices. Except for the Greek political newspaper «Ta Nea» and the Romanian tabloid «Click», all leading

European newspapers have developed at least one specific application. By type, besides the obvious adaptations of information content of the web editions, complementary services for mobile devices include specialised applications for thematic sections (sports, etc.), special coverage of events or dates, or commercial content.

Overall, its success, however, can be described as relative. Even though all the newspapers analysed offer free downloads, according to data offered by Google Android Play, only three of them (10.7%) have achieved over one million downloads of their applications, compared to thirteen who have achieved less than one hundred thousand (46.4%).

Specific applications for mobile devices, in effect, add to difficulties in becoming new windows for the consumption of digital media among users. For one, its exclusive character, which requires a customised download, collides with the global kiosk that can be accessed through a browser screen. The constant changes in the media and the inevitable and constant application updates neither add fluency in use. In addition, the technical limitations cause that some of the contents can not be shown in the applications themselves, which also limits their possibilities. But above all, probably the main obstacle to their development is the generalisation of responsive web design, which allows the correct visualization of the contents of a page on any device, and causes in many cases that specific applications render superfluous.

For the media, meanwhile, the creation of multiplatform content does not imply an added difficulty in the production process, since the publication in increasingly varied formats and media is already developed in most newsrooms through fully integrated content management systems (CMS) (López-Torregrosa, 2013).

3.4. New windows of access to information

Traditionally, regardless of the format, the press has understood that the front pages of newspapers were the windows from which readers could peer into its contents. Its unique importance made them extremely synthetic and strongly hierarchical spaces, governed by stable conventions for decades.

The implementation of the media and digital formats has forced media to rethink this concept to a much greater extent based on the influence of consumption of their audience rather than purely technical criteria (Peña, Perez, & Genaut, 2010).

Front pages have become big display windows for all the contents in the newspaper, like products stacked up in the halls of a large bazaar. Even though the structure has been rationalised little by little, the information exuberance remains one of the hallmarks of European newspapers online, with front page surfaces on their web editions that increase the format and number of informative texts and images on the printed front page version tenfold.

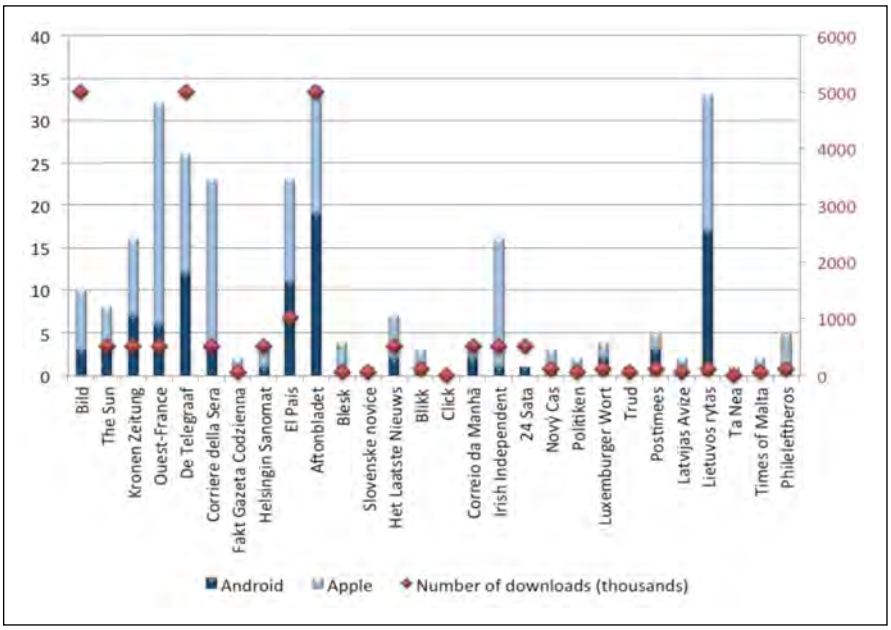

Figure 3. Number of mobile apps developed by European newspapers.

There are several reasons for this change. For one thing, a lot of readers go over content superficially and sporadically (Milosevic, Chisholm, Kilman, & Henriksson, 2014). In terms of cybermetrics, the term «bounce rate» was coined to define the number of visitors who spend less than thirty seconds on the website before moving on to something different. In the case of European newspapers, the average of this «bounce

rate» amounts to 50.21% of visits.

The analysis of other indicators applied to 28 major European newspapers corroborates this epidermal consumption trend of information in digital media, since the average page views per visitor amounts to 3.57 and the average length of the visit is something more than six minutes (361.46 seconds). Therefore, the main page takes on a special significance, not as the synthesis of a product to be consumed as a whole, as usually happens with newspapers or radio or television news, but as a product index trying to show everything it has to offer on a single page.

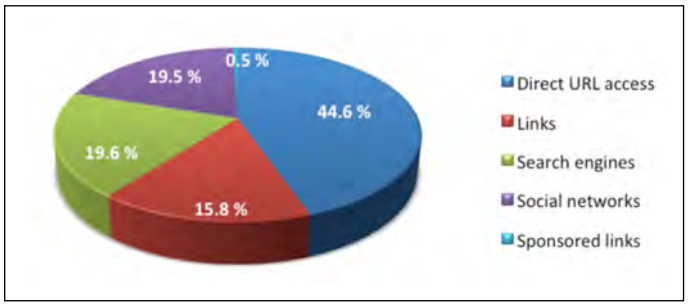

Figure 4. Sources of access to European newspaper websites.

However, data on the origin of the access downplays the importance of the front pages as catalysts of consumption habits for digital readers. Currently, less than half of visits (44.6%) received by 28 newspapers analysed directly access the media website at its main URL (home).

Search engines, on the contrary, have become increasingly important as a gateway to informative products. In the case of top European newspapers, 19.6% of visitors access the media website through a search engine but, obviously, some of the top search terms are still the name of the newspaper itself.

However, significant links between search engines and the flow of visitors to the newspapers also emerge. The search of «latest news» on Google Spain redirects to, in order, websites for «El País», «Europa Press», «20 Minutos» and «El Mundo». In the case of «The Sun», meanwhile, almost 10% of its hits from search engines come from the name of his iconic «Page 3». This source of visitors ranges from information sites to service web pages, which provide examples like the first result for «horoscope» in Google Spain redirects to the newspaper «ABC».

Positioning techniques, that is, the set of procedures that help to place a website or a web page in an optimal location between the results provided by a search engine, thus acquire a great importance in the media web page management (Alonso, Garcia, & Zazo, 2008). The ability to generate content that occupies privileged places in search results –for example, in the Google PageRank index– means considering not only traditional news and design criteria in development of information and services, but also the main basics of cybermetrics, such as the authority of the domain in which the site is located, thematic relevance of the pages from that link to it, the text and the link position, etc.

Thus, writing for digital media has incorporated the concern for the development of metadata, keywords and terms included in the title as the basis for better visibility of content published by newspapers. As the development of the news on paper does not stop with its writing, but in its integration into the newspaper design, the information on the website also incorporates the task of maximizing its ability to generate traffic, because unlike printed products, which are consumed as a whole, web pages can be consumed individually and in an unconnected way.

The high volume of textual information stored by printed newspapers, their frequent updating, the thematic coherence of their content and the high number of visits that they are capable of generating help ensure that the authority of their websites is high and that their texts frequently appear among first search results. However, this trend also supposes a change in the deep structure of the conception of media in terms of access to information. They go from being homogeneous sets of content consumed in their entirety in agglomerations of information that are geared towards readers' individual interests. In the information product's conception for digital media, the news or services are gradually replacing printed newspaper as consumption unit.

Social networks –particularly Facebook and Twitter– have also become important sources of access to information in newspapers and, in the case of the top European newspapers, a source of 19.5% of visits. Their growing influence explains the increase in the media's interest to create virtual communities around their news outlets, and also affects strengthening the news unit as the core of data consumption in digital formats. Their use as tools for promoting content, mainly in the case of Facebook, and with a more conversational profile in the case of Twitter, is highly valued by the media (Noguera, 2010; García-de-Torres & al., 2011).

Finally, European newspapers obtain 15.8% of

visits through links on other websites –for example, from other media that belong to the same publishing company– and only 0.5% from the sponsored links in search engines.

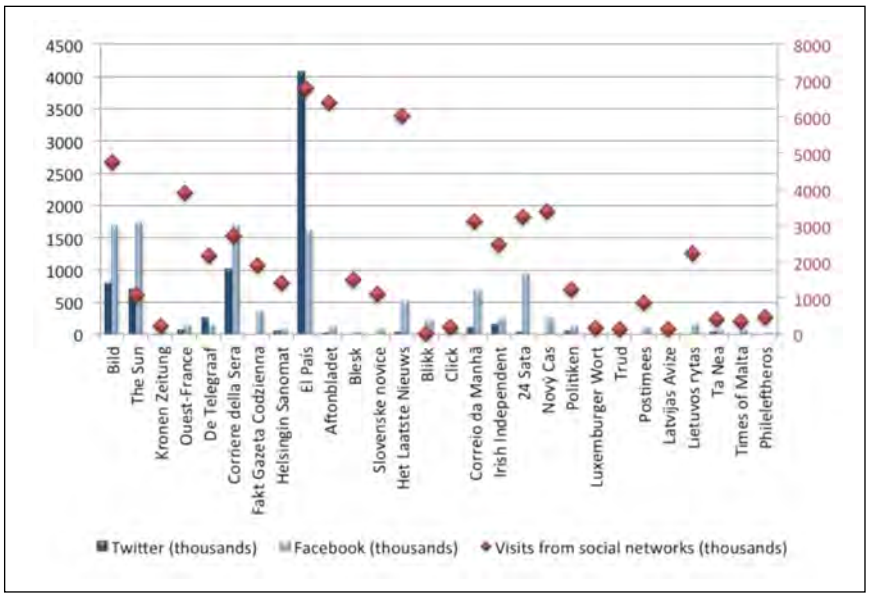

Figure 5. European newspapers on social networks.

4. Discussion and conclusions

The analysis of adaptation to screen interface and new digital formats of the top newspapers from 28 European countries leads to the following conclusions:

1) In general, two out of three newspapers have managed to shift their leadership in printed media to the Internet, mostly aided by textual weight of the consumption of information on the Internet. This success, however, is limited in the case of media that have opted for rigid paywalls or with a regional or local broadcast area.

2) The consumption of media in the digital formats is diluting the traditional correspondence between the political and administrative boundaries and areas of media dissemination for creating global audiences. The result is the emerging new global media from pre-existing national media, which have excellent examples in the British news outlets «Daily Mail» and «The Guardian».

3) The widespread use of mobile devices (smartphones and tablets) favours an alternative distribution of information that, far from being a complement to traditional editions, is in many cases the main source of influx of readership for media. The result of this trend is that European newspapers have a firm commitment to the creation of products on multiple platforms.

4) The incorporation of a new screen and interface for consumption of information has also led to a transformation in product structure and design, where sporadic and superficial reading of information favours the existence of highly saturated front pages. With a «bounce rate» of 50.21% and an average of 3.57 pages viewed per visit, websites have increased their reach significantly.

5) Digital formats have opened new windows of information access, which alter the way the media distribute their content and less than half of visits (44.6%) access the websites of the online Europeans newspapers directly through their URL. The growing importance of search engines (19.6%) promotes the incorporation of positioning techniques to the process of information development, which have replaced the product as a consumption unit online. Furthermore, social networks (19.5 %) are an important source of visitors for European newspapers' digital formats, which have incorporated them as a source for redistribution of content.

Notes

[1] Data from the National Readership Survey are obtained through a very large sample of telephone surveys. Data from the 2014 edition are based on 35,570 telephone interviews conducted between December 19, 2013 and December 1, 2014.

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Online and Offline Pornography Consumption in Colombian Adolescents

Consumo de pornografía on-line y off-line en adolescentes colombianos

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ABSTRACT
Mass media consumption has increased markedly in recent years. One unintended consequence of this increase is the proliferation of risky consumption, including online and offline pornography. Although the literature has noted a series of predictive variables (age, gender, ethnicity, socioeconomic status, and family structure), recent studies have suggested including values and lifestyles as relevant factors in consumption decisions. The objective of the present study was to examine whether adolescents' lifestyles were relevant predictors of the consumption of pornography both on the Internet and in magazines or videos. A cross-sectional observational study design that included a representative sample of 9,942 Colombian adolescents (M_{age}=14.93, SD=2.47) was used. To control the effects of sociodemographic, structural, and individual variables, their lifestyles were examined using a multiple regression analysis and mediation analysis. The results indicated that a positive intrafamilial style was associated with a reduction in the consumption of pornography; however, both a negative intrafamilial style and a relational independence style increased consumption. In addition, the study suggests that family relational styles can mediate the relationship between positive values and risky behavior both online and offline. Finally, we discuss the results from the relational perspective, including its application in media literacy programs.

RESUMEN
El consumo de medios de comunicación se ha incrementado notablemente en los últimos años. Una consecuencia no deseada de ello es la proliferación de consumos de riesgo, como es el caso de la pornografía on-line y off-line. Aunque la literatura ha señalado una serie de variables predictoras (edad, género, etnia, nivel socioeconómico o estructura familiar), estudios recientes han sugerido incluir los valores y los estilos de vida como factores asociados a las decisiones de consumo. El objetivo del presente trabajo fue examinar si los estilos de vida relacionales de los adolescentes son predictores relevantes del consumo de pornografía tanto en Internet como en revistas o vídeos. Se empleó un diseño observacional transversal que incluyó una muestra representativa de 9.942 adolescentes colombianos (M_{edad}=14,93, DT=2,47). Los estilos de vida, controlando el efecto de variables sociodemográficas, estructurales e individuales, fueron sometidos a un análisis de regresión múltiple y a un análisis de mediación. Los resultados indicaron que el estilo intrafamiliar positivo estuvo asociado con una reducción en el consumo de pornografía, sin embargo, tanto el estilo intrafamiliar negativo como el de independencia relacional incrementan el mismo. Además se propone que los estilos relacionales familiares pueden mediar la relación entre los valores positivos y el comportamiento de riesgo on-line y off-line. Finalmente, se realiza una discusión de los resultados desde la perspectiva relacional y su aplicación en programas de educación mediática.

KEYWORDS | PALABRAS CLAVE
Internet, pornography, adolescents, lifestyles, values, family, leisure.
Internet, pornografía, adolescentes, estilos de vida, valores, familia, tiempo libre.

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1. Introduction

Information and communications technology (ICT) has changed the way people communicate and consume because they have easy access to new experiences, regardless of their gender and socioeconomic status (Mascheroni & Ólafsson, 2014). This boom has led to a growth in virtual experiences that, in some cases, may involve risky consumption or involuntary interaction with pornographic sites (Livingstone & al., 2014).

Although it is a controversial argument that has not yet achieved consensus, some studies and social policies argue that it is important to reduce the consumption of pornography online and offline among children and adolescents (Byron, 2010). For this reason, and having taken into account the studies that have addressed the subject using personality (Williams & al., 2009) or sociodemographic (McKee, 2007) data as predictor variables, as well as the studies that have recommended incorporating feelings and interests linked to specific behaviors to analyze consumption, in this study we analyzed the phenomenon using lifestyle theory. In addition to contributing to scientific knowledge, the results may be useful for the analysis of the needs and target audiences of prevention programs and media literacy education, increasing their efficiency and effectiveness.

1.1. Pornography consumption: predictive factors

Research has shown that the consumption of pornography may be linked to increased violent behavior, increased substance abuse and depression, and low levels of emotional ties to the primary caregiver (Ybarra & Mitchell, 2005; Kingston & al., 2008; Vega & Malamuth, 2007). Regarding the sociodemographic variables that moderate the consumption of pornography, the literature has mainly analyzed the effects of gender, age, ethnicity, family structure, and socioeconomic status, although in some of these studies, the results have contrasted (Wright, 2013).

Men consume more pornography than women (Ybarra & Mitchell, 2005), as do adolescents (Sabina, Wolak, & Finkelhor, 2008), especially from 13 or 14 years of age onward. Some studies have controlled for the association between ethnicity and consumption (Lambert & al., 2012), showing that it has a minimal impact on the use of pornography (Williams & al., 2009).

Regarding family structure, Rodrigo and al. (2006) have noted that adolescents with healthier lifestyles belong to 2-parent families (see also, for example, findings that the 2-parent family structure is related to the reduction of risky behaviors among youth) (Cabrera & al., 2014). With regard to the relationship between socioeconomic status and the consumption of pornography, it has been shown that adolescents from families from higher socioeconomic strata use pornography more frequently (Luder & al., 2011).

One factor that influences consumption decisions is values (Kahle & Chiagouris, 1997), defined as general, systematic, deep, and durable (though modifiable) convictions on the social acceptability of certain actions, which are transmitted through the process of socialization. Although values imply guidance for social action (Cook & al., 2012), some studies suggest that the relationship between values and social action is mediated by lifestyles (Brunsø, Scholderer, & Grunert, 2004). Lifestyles can be defined as a complex, integrated system that is dynamic in terms of behaviors, guidelines, resources, and knowledge structures developed through experience that are expressed in personal and social identity (Archer, 2012; Bravo & Rasco, 2013; Faggiano, 2007; Thirlaway & Upton, 2009). Lifestyles are built by adolescents in a specific context of socialization that influences their thoughts and decisions, given that social interactions shape lifestyles and influence the selection and impact of media content (Bagdasarov & al., 2010).

Among the most significant factors in shaping lifestyles are relationships with friends, relationships with family, and leisure activities, especially those related to media consumption (Faggiano, 2007). Intrafamilial relations and relationships with friends are key to the development of lifestyles (Hendry & al., 2003; Archer, 2012) and the social and emotional development of children (Ispa & al., 2013; Stacy, Newcomb, & Bentler, 1991).

Parenting style (Cabrera & al., 2014; Osorio & al., 2009; Kirsh, 2010; Wisenblit & al., 2013) and the type of family communication (Johnsson-Smaragdi 1994) moderate the type of consumption and impact that the media has on adolescents. Positive family relationships reduce the likelihood to engage in problematic behaviors online (Noll & al., 2013). Measures of intergenerational relationship quality, such as dialogue and participation in the familial processes of adolescents within their families (Currie & al., 2004), are important for the prevention of risky behaviors (Corrado & Freedman, 2011).

The peer group is a normative model for adolescents (Cheung & al., 2001) and therefore is a fundamental agent of socialization (Johnsson-Smaragdi 1994), influencing online consumption (Hargrave & Livingstone, 2006; Steele & Brown, 1995), behaviors,

values, and social and cultural identity (Currie & al., 2004). In relation to the time dedicated to media consumption, a recent study has shown that consistent computer use (more than 10 hours per week) is associated with the consumption of pornography (Mattebo & al., 2013). However, it is unclear whether it is intentional or accidental consumption. Therefore, it is important to control for other predictors.

2. Objectives

The main aim of this study, based on lifestyle theory (Faggiano, 2007) and in a relational perspective that considers social actors' decisions to be an emergent phenomenon of the interactive process of socialization (Archer, 2012), was to provide an analysis of the factors associated with the consumption of pornography among adolescents. To that end, we tested the following hypotheses:

a) Relational lifestyles predict the consumption of risky Internet content.

b) Relational lifestyles mediate the relationship between adolescents' values and their consumption of pornography.

> The promotion of healthy lifestyles (and ICT usage) should include daily decision-making training, even in aspects that initially do not seem related to media consumption. Finally, the relevance of family role models is clear, given that they are the foundation for the construction of harmonious lifestyles.

3. Method

3.1. Participants and design

The present study featured a probabilistic, multistage, stratified sample, with a random selection of 9,942 adolescent students in Colombia between 13 and 18 years of age (Mage=14.93, SD=2.47), of whom 5,111 (53.52%) were female. To define the sample of the study, we used the base of 2012 projections of the main population, selecting cities with a population greater than 75,000 inhabitants. This selection resulted in 60 cities grouped into six regions, which permitted a representation of the different geographical zones in the country. The students were contacted via randomly selected schools. The selection of the schools to survey was performed such that the schools selected in the sample have a distribution that is similar to the whole. A total of 150 schools participated (67 public and 83 private), of which 11 had gender-segregated schooling (2 male and 9 female), 72 were secular, and 78 were religious. Those charged with data collection were professionals from the company Cifras y Conceptos, who went to the educational institutions, contacted the directors, and obtained the students' informed consent for participation. The students completed a semi-structured survey in which they responded to a series of questions related to their lifestyles, values, activities, family, friends, and school. The data analysis was conducted using the SPSS statistical software package.

3.2. Predictor variables

3.2.1. Sociodemographic variables

Age was measured with 1 item: «How old are you?». The response options for this item were from 12 to 19 years. Gender was coded as a «dummy» variable, where males received a 1 and females 0. The ethnicity of the adolescents was collected based on 5 categories (mestizo, indigenous, Afro-Colombian, white, and none).

3.2.2. Structural variables

Family structure was measured using 3 categories, according to the responses to the following item: «In my house I live with: mom, dad, sibling(s), grandparents, and others». The categories were marked in terms of the absence or presence of parents in the family. Specifically, the first level of family structure comprised participants who lived with other people who were not their parents (e.g., grandparents, siblings, peers, etc.), the second level those who lived with 1 of the 2 parents, and the third level those who lived with both parents. In addition, the adolescents were categorized into 5 levels of socioeconomic status according to the labor activity of their parents (1=«low socioeconomic status» to 5=«high socioeconomic status») (for a similar codification of socioeconomic status, see EU Kids Online, Livingstone & Haddon,

2009; Jiménez & al., 2013).

3.2.3. Individual variables

The values were measured using six 5-point Likert-type items (1=«not at all important», 5=«very important»). They were asked how important they considered each of the following statements: «Being a just and loyal person», «Having a family», «Respecting authority», «Living a morally dignified life», «Being helpful and showing tolerance and respect to others», and «Being brave, able to risk myself before other things» (for a similar list of values, see Wilson and al., 2005; Experiment 3). Responses to these 6 items were highly intercorrelated (α= .95) such that an indicator index of adolescent values was formed.

3.2.4. Relational variables

A total of 63 items about media consumption and interactions with groups of friends and family that were representative of the lifestyles of the adolescents (see Table 1) were included in the analysis.

The format of the response was a 5-point Likert-type scale ranging from 1 (Nothing/Never) to 5 (A lot). Number of factors to extract (5) was decided based on the scree plot (Cattell, 1966). Afterwards, an exploratory factor analysis (EFA) was conducted on the total sample (N=8,685). The method of estimation was maximum likelihood (ML), given that the indices of

Table 1. Factor loadings of each item, and correlation between factors

	Positive intrafamilial style	Negative intrafamilial style	Positive mediation style	Relational independence style	Relational marginalization style
Help-family	.747	.016	.272	.061	-.355
Mom-understanding	.440	-.100	.338	.034	-.114
Mom-importance	.416	-.131	.339	.046	-.115
Mom-relation	.605	.197	.209	.106	-.323
Mom-affection	.290	-.068	.195	.048	-.102
Dad-relation	.498	.231	.352	.083	-.241
Dad-affection	.284	.006	.212	.057	-.118
Parents-relation	.483	.243	.208	.097	-.234
Caretaker-relation	.368	.177	.153	.110	-.236
Others-affection	.416	.340	.125	.199	-.283
Family-project	.403	.179	.132	.090	-.326
Family-future	.351	.207	.104	.095	-.316
Family-freedom	.280	.155	.078	.142	-.224
Family-conversation	.722	.075	.263	.063	-.324
Family-decisions	.723	.085	.274	.065	-.312
Family-time	.700	.080	.263	.061	-.292
Family-love	.659	.038	.246	.092	-.326
Climate-love	.740	.091	.267	.073	-.326
Climate-brotherly	.716	.135	.268	.091	-.352
Climate-tolerant	.642	.186	.229	.076	-.294
Climate-loyal	.645	.177	.234	.105	-.315
Climate-respectful	.681	.103	.224	.075	-.297
Climate-confidence	.559	.218	.182	.102	-.271
Family-abuse	.087	.319	-.014	.085	-.129
Family-physical violence	.138	.893	-.039	.134	-.212
Family-verbal violence	.045	.856	-.069	.142	-.194
Family-vengeful	.142	.818	-.028	.138	-.202
Family-solitary	.165	.601	-.030	.090	-.157
Family-conflicts	.046	.498	-.046	.158	-.405
Family-impulsiveness	.273	.303	.053	.192	-.291
Friends-escape-route	.162	.241	.074	.131	-.149
Smoking/Drinking-escape-route	.025	.312	-.002	.271	-.055
Activities-escape-route	.181	.213	.069	.084	-.096
Dad-homework	.178	-.013	.129	-.050	-.124
Dad-importance	.220	-.019	.785	.081	-.077
Dad-understanding	.286	-.040	.910	.071	-.081
Dad-support	.273	-.061	.922	.082	-.093
Siblings-importance	.165	.025	.222	.005	-.074
Boy/girlfriend-importance	.019	.149	.025	.156	-.027
Acquaintances-importance	.137	.064	.113	.194	-.096
Classmates-importance	.166	.044	.123	.140	-.097
Friend-Group-importance	.045	.020	.063	.265	-.064
Friends-support	.178	.035	.087	.186	-.133
Friends-sexuality	.031	.211	-.015	.273	-.078
Friends-escape route	.044	.176	-.031	.222	-.107
Friends-joint plans	.159	.100	.046	.202	-.115
Friends-sports	.178	.140	.123	.139	-.086
Internet-week	-.020	.125	.005	.635	-.037
Internet-weekend	.007	.096	.019	.680	-.012
Music-movies	.046	.055	.075	.285	-.081
Online-gaming	.102	.102	.094	.133	-.054
Skype/Facebook/Chat	.025	-.010	.022	.383	-.050
Twitter	.045	.073	.058	.333	-.067
SNS-week	-.020	.115	-.021	.754	-.039
SNS-weekend	-.002	.102	-.010	.789	-.026
TV-week	.068	.124	.010	.269	-.050
TV-weekend	.071	.098	.031	.274	-.036
Family-not-safe-space	.355	.102	.116	.114	-.736
Family-not-unit	.454	.041	.163	.107	-.791
Family-not-learning	.405	.120	.149	.109	-.839
Family-not-help	.442	.096	.171	.113	-.856
Family-not community	.296	.238	.094	.124	-.719
Family-not-sustaining	.185	.346	.037	.159	-.600
Positive-intrafamilial-style		.160	.386	.140	-.425
Negative-intrafamilial-style			-.039	.241	-.241
Positive-mediation-style				.100	-.121
Relational-independence-style					-.158
Relational-marginalization-style					

skewness and kurtosis did not indicate a strong deviation from normality (table 1). According to the theoretical framework, we selected oblique rotation as the method for the factor rotation due to the expectation of finding correlations among factors. The results indicated that the 5 factors extracted accounted for 32.72% of the variance of the test (for factor loadings, see table 1). The internal consistency of the total scale was high (α=.89), leading us to consider that the instrument is reliable. The factor rotation structure is theoretically relevant (Corcuera & al., 2010; Faggiano, 2007), and its composition is presented in table 2.

The composition of the first factor shows positive intrafamilial communication, the second the opposite situation (violent family), the third a climate of positive dialogue between adolescents and their parents, the fourth a socialization context external to the family that is greatly relevant to decision-making, and the fourth the impossibility of counting on affective and material support from one's own family. The means of each of these factors (intrafamilial communication, intrafamilial violence, paternal support, use of media, familial exclusion) were retained as five different predictor variables to be employed to compute stepwise regressions.

3.3. Criterion variable

Pornography consumption. The risky consumption on the Internet was measured using 4 items related to the consumption of pornography and erotic images and videos both on- and offline. The items asked about the frequency of occurrence, and the response options ranged from 1 (never) to 5 (always). The items were the following: «I search for erotic or pornographic images and/or videos», «I search for pictures and videos of models (like Natalia Paris, David Beckham, etc.)», «I accidentally find myself on a page with sexual or pornographic content», and «I watch pornographic movies (Playboy, Venus, etc.)». The internal consistency of these 4 items was moderately high (α=.68), and thus were averaged to create a composite index of pornography consumption.

4. Results

4.1. Pornography consumption

To test the first hypothesis, a hierarchical multiple linear regression analysis was conducted, as recommended by Aiken and West (1991). The criterion variable (i.e., the index of pornography consumption) was predicted based on the predictor variables. In the first block, the sociodemographic variables (age, gender, and ethnicity) were introduced. In the second block, the structural variables (socioeconomic status and family structure) were introduced. In the third block the individual variables (i.e., values) were introduced. Finally, in the fourth block, the lifestyle variables (see table 3 for the regression coefficients) were introduced. The first block explained 10.1% of the total variance in the consumption of pornography ($R2=.101$, $p<.001$). The second block did not add any information ($\Delta R2=.0004$, $p=.26$). The third block explained a significantly larger portion of the variance than the second block ($\Delta R2=.005$, $p<.001$). Finally, the fourth block explained 17.4% of total variance in pornography consumption ($R2=.174$, $p<.001$). The difference in the R2 values between blocks was statistically significant ($\Delta R2=.068$, $p<.001$). In the first block concerning sociodemographic variables, the regression analysis indicated a significant main effect of age, $\beta=.032$, $t(6558)=6.274$, $p<.001$. In addition, a significant main effect was found for the variable of gender, which is consistent with the prediction of the literature, $\beta=.383$, $t(6558)=26.331$, $p<.001$. Male teens ($M=1.71$, $SD=.72$) consume more pornography than female teens ($M=1.33$, $SD=.49$). The effect of ethnicity was not significant ($\beta=-.002$, $p=.6$). In the second block, neither socioeconomic status ($\beta=.004$, $p=.39$) nor family structure ($\beta=-.017$, $p=.17$) had a significant impact on the consumption of pornography. In the third block, the variable of values showed a main effect on pornography consumption, $\beta=-.038$, $t(6558)=-5.799$, $p<.001$, indicating that pornography consumption decreases as participants have more values. In the fourth block con-

Table 2. Factor composition

Factor	Number of items	Internal consistency	Examples of items
Positive intrafamilial style	23	α=.90	«I am satisfied with the help I get from my family when I have problems», «I am satisfied with the time my family and I spend together»
Negative intrafamilial style	10	α=.78	«Have I suffered some type of sexual abuse committed by someone in my family?», «My family is physically violent»
Positive mediation style	5	α=.74	«I can count on my dad in difficult moments», «My relation with my father is important to me»
Relational independence style	7	α=.74	«I log onto Skype, MSN Messenger, Gtalk, Facebook Chat, or chat rooms in general», «My group of friends is my preferred source of information about sexuality»
Relational marginalization style	6	α=.89	«My family is not a place of mutual and unconditional help», «My family is not a provider of economic resources»

cerning lifestyles, a main effect was found for positive intrafamilial relations, β=-.082, t(6558)=-6.010, p<.001. If these relations are positive, pornography consumption decreases. The opposite was found for the negative intrafamilial relations style, β=.154, t(6558)=11.571, p<.001: consumption of pornography increases in contexts of violent socialization. In addition, a significant main effect was observed for the relational independence style, β=.241, t(6558)=16.126, p<.001. No significant effect was observed for the positive mediation style (β=-.011, p=.17) or the relational marginalization style (β=-.009, p=.25).

Table 3. Prediction of pornography consumption

	Pornography consumption B (SE)
Block 1: Sociodemographic variables	
Age	.852*** (.08)
Ethnicity	-.002 (.004)
Sex	.383*** (.02)
R2 (%)	.101***
Block 2: Structural variables	
Socioeconomic status	.004 (.01)
Family structure	-.017 (.01)
ΔR2 (%)	.000
Block 3: Individual variables	
Values	-.038*** (.01)
ΔR2 (%)	.005***
Block 4: Relational variables	
Positive intrafamilial style	-.082*** (.01)
Negative intrafamilial style	.154*** (.01)
Positive mediation style	-.011 (.01)
Relational independence style	.241*** (.02)
Relational marginalization style	-.009 (.01)
ΔR2 (%)	.068***
Total R2 (%)	**.173***

N=6,559. Cell entries are non-standardized beta coefficients (β) and SE.. †p<.1; *p<.05; ** p<.01; ***p<.001.

4.2. Mediation

To test the second hypothesis, a multiple mediation analysis was conducted with 2 mediators operating in parallel. The positive and negative intrafamilial lifestyles were submitted to a parallel mediation analysis aimed at exploring whether these lifestyles mediated the relationship between adolescents' values and their decision to consume pornography. The bootstrapping procedure recommended by Hayes and Preacher (2013) was used with the macro process packet of the SPSS program (Model 4, multiple mediators in parallel). First, the direct effect of the values on the consumption of pornography was significant, β=-.05, t(8625)=-9.153, p<.001. Second, the effect of the values on both mediators was also significant, β=-.06, t(8625)=-11.482, p<.001 for the positive intrafamilial style and β=-.236, t(8625)=-47.131, p<.001 for the negative intrafamilial style. Third, when the mediators and the values were entered as predictors, the effect of the mediators was significant, ar=-.08, t(8625)=-7.897, p<.001 for the positive intrafamilial style and β=.190, t(8625) =17.197, p<.001 for the negative intrafamilial style, but the effect of the values became non-significant, β=-.007, t(8625)=-1.263, p=.21. As illustrated in Figure 1, the indirect effects of both the positive intrafamilial style and the negative intrafamilial style were statistically significant, β=.005, SE=.001 [IC 95%: (.0034, .0073)] for the positive intrafamilial style and β=-.045, SE=.004 [IC 95%: (-.0518, -.0385)] for the negative intrafamilial style. Preacher and Hayes (2008) demonstrated that when zero falls outside the interval, mediation is present. Since zero fell outside both intervals, we can say that the direct effect of values on pornography consumption was mediated by both the positive and the negative intrafamilial styles.

5. Discussion

The results of this research showed that relational lifestyles partially explain pornography consumption: positive intrafamilial styles are associated with a reduction in consumption while the opposite was found for negative intrafamilial styles (H1). On the other hand, it was found that the relationship between values and pornography consumption is mediated by both positive and negative intrafamilial relations (H2).

With regard to the sociodemographic variables, the results were convergent with those found in the previous literature concerning age and gender (Sabina & al., 2008; Ybarra & Mitchell, 2005). That is, male adolescents report consuming a greater quantity of pornography than female adolescents and that those in later adolescence report consuming pornography more frequently than those in early adolescence. The remaining sociodemographic or structural variables have insignificant effects on the consumption of pornography.

Regarding the lifestyle variables, the results support that the relationships that adolescents have with their parents configure their decision-making processes (Archer, 2012). A familial climate of dialogue, comprehension, and participation allows for an increase in the possibilities of a positive use of ICT. Conversely, negative intergenerational relations, which often lead to the search for role models outside of the family, including in untrustworthy contexts, are associated

with a greater negative consumption of new technologies. A familial climate that is violent, vengeful, and solitary and that considers the family to be a place of conflict can lead to greater consumption of pornography, increasing the related risks.

Regarding media consumption, the intensive use of the Internet to visit social networks, download music and movies, gamble online, and search for information on sexuality that the family does not provide (what has been called the «relational independence style») leads to a greater consumption of pornography, which in many cases can be accidental. Finally, using the group of friends and virtual relations to discuss issues that are not much talked about in the family, as in the case of sexuality, can induce young people's exploration of new experiences.

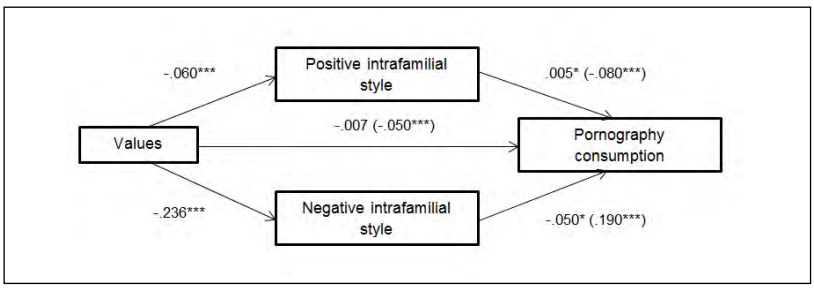

Figure 1. Mediation of lifestyles between values and pornography consumption
*p<.05; **p<.01; ***p<.001.

The results are relevant not only because they support the importance of relational lifestyles in decisions about risky consumption but also because they show how these same lifestyles are mediators of the effect of values on adolescent behavior. This finding supports the hypothesis of Brunsø and al. (2004) and the need to incorporate peer-to-peer strategies into media literacy programs, favoring the creation of positive friendship environments for cases in which violent family contexts prevail. Furthermore, the promotion of healthy lifestyles (and ICT usage) should include daily decision-making training, even in aspects that initially do not seem related to media consumption. Finally, the relevance of family role models is clear, given that they are the foundation for the construction of harmonious lifestyles (Corcuera & al., 2010; Osorio & al., 2009).

One of the limitations of the present study is that the sample included only adolescent students in schools located in cities of more than 75,000 inhabitants. Future studies on this topic could apply qualitative methodologies that would complement the interpretation of a phenomenon as complex as the consumption of pornography on the Internet, which would admit different conceptualizations depending on the users.

One of the strengths of this study is that it uses a sample representative of adolescents from 12 to 19 years of age in Colombia, which allows us to extract conclusions that can be extrapolated to adolescent students in the urban areas of this country. The correlational nature of the design ensures this ability, although it reduces the possibility of confirming causal relationships between lifestyles and pornography consumption or establishing the direction of the data.

Finally, the present study can help in the design of intervention programs aimed at reducing pornography consumption and that are based on adolescent lifestyles to achieve this goal. For instance, an intervention designed to consider not only sociodemographic variables but also adolescents' lifestyles would allow a better matching or tailoring between the message of the intervention and its recipients, avoiding the appearance of a possible boomerang effect produced by the counter-attitudinal nature of the intervention for those who consume the most pornography (Brändle & al., 2011).

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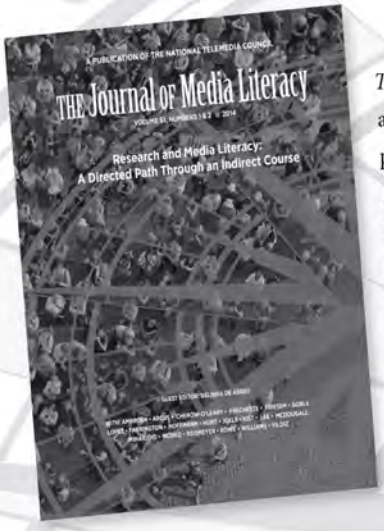

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Cyberactivism: A new form of participation for University Students

Ciberactivismo: nueva forma de participación para estudiantes universitarios

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ABSTRACT

The purpose of this article is to show the results derived from a sample of students who were enrolled in different bachelor degree programs offered by the University of Sonora in Mexico. There was a double objective for this study. First, to identify cyber activist students through the answers gathered through a questionnaire taken electronically using as inclusion criteria the presence of high and medium levels of participation and commitment in different actions undertaken in four topic areas (environment, academic, social and citizen issues, and human rights). As a second objective, and after selecting three unique cases of cyber activist students, inflexion points were determined in the activities performed by these youngsters in digital social networks. Using personal narrative as a methodological strategy, the students described how they interact with others through different digital networks. Among the first categories identified in the in-depth interviews are: interaction history (use, access and availability of technology at a young age), and active participation about topics of interest in social networks (organization and the perceptions of achievements made). As main findings, there are the availability of these resources from a young age, personal motivation in participating in diverse topics, enjoyment of expressing one's opinion freely, electronic participation as a way to commit to a cause, and not joining an organization while participating.

RESUMEN

Se presentan resultados derivados de una muestra de estudiantes que asisten a las diversas licenciaturas que ofrece la Universidad de Sonora en México. El objetivo fue doble, en un primer momento, identificar a estudiantes ciberactivistas a través de las respuestas obtenidas de un cuestionario aplicado de manera electrónica, utilizando como criterios de inclusión la presencia de puntajes medios y altos en el nivel de participación y compromiso en las diversas acciones emprendidas en cuatro temas (medio ambiente, académicos, problemas sociales y ciudadanos, y derechos humanos). En un segundo momento y a partir de la selección de tres casos únicos de estudiantes ciberactivistas, se determinaron puntos de inflexión en las actividades desarrolladas por estos jóvenes en las redes sociales digitales, utilizando como estrategia metodológica la narrativa de los propios estudiantes cuando interactúan con otros en las redes. Entre las categorías iniciales en las entrevistas en profundidad se encuentra: la historia de interacción (uso, acceso y disposición de la tecnología desde temprana edad), y la participación activa en las redes sociales sobre temas de interés (organización y percepción de logros alcanzados). Como principales hallazgos se encuentra la disposición de estos recursos desde temprana edad, la motivación personal en los diversos temas, el gusto para expresarse de manera libre, la participación electrónica como forma de comprometerse con las causas, y la no afiliación a organizaciones al participar.

KEYWORDS | PALABRAS CLAVE

Cyber activist, cyberactivism, commitment, digital culture, university students, interaction, student participation, social networks. Activista cibernético, ciberactivismo, cultura digital, estudiantes universitarios, interacción, participación estudiantil, redes sociales.

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1. Introduction and state of affairs

The impact that technological tools have today in the general population is well known, in particular, it is young people who actively participate through Social Networking Sites (SNS) as part of their daily lives. They do it in order to communicate, to be entertained, to learn and to participate in their civic, political or cultural reality.

In a study conducted over 21 countries, recent statistics on the use of Information and Communications Technology (ICT) show that people have integrated themselves into the use of Internet, in particular through the use of social media through smartphones. These technological tools have become the most popular and most used among individuals under 30 with some degree of higher education (Pew Research Center, 2012). By 2013 in Mexico, 34.4% of households had Internet access (an increase of 12.8% compared to 2012); of all Internet users, 38.6% were young adults between the ages of 18 to 34, and 39.6% used SNS (INEGI, 2014).

This has produced a culture among young people in which it is possible to identify elements of ICT integration in everyday activities in order to organize, communicate, create content, play games, discuss, chat and even encourage others to participate (Castells, 2014). In this way, young people are building their reality of emerging issues and collective interests through active participation in SNS; however, only a few are placing themselves as in control of content management, virtual community organization, and data compilation.

In all these activities, participation[1] is a nodal concept that becomes salient; it is a form of interaction among individuals sharing ideas and values in which each one seeks to influence the other. In the case of young people, digital media usage is being used increasingly intensively in order to generate participation. The integration of digital media has created new ways of participating, or a participatory culture (Jenkins et al, 2009). Participating through different networks and digital platforms allows them to denote different forms of engagement, which are categorized as medium or low level by some authors (Castells, 2014; De-Ugarte, 2007). Furthermore, communities are created in which the decision to continue participating and belonging is made because of emotion, closeness and level of commitment they have to the topic (Royo-Vela & Casamassima, 2010).

According to Serna (1997) –who takes up what Clauss Offe proposed– participation by young adults has the following features: it revolves around new issues or ideologies, seeks action and immediate results, the reason why their relationship with the topic is not long term, participates in a community without losing the subjects' individuality, organizes horizontally, and uses the technological means available.

Recently, some authors have used different terms when it comes to refer to types of participation: standing out among them are the youth, the effective, the social, the political, and the civic ones. Youth participation is considered as such when there are young people in general, as a segment of the population, who carry it out, whether they are students or not. Conversely, when there is involvement in decision-making, this is called effective participation (Krauskopf, 2000). Social participation engages in issues with peers and seeks to support mainstream topics while political and civic participation are linked to exercising the right to vote and interaction with political parties or well-consolidated political groups (Balardini, 2005).

Meanwhile, Henriquez (2011) mentions that changes in the form of communication and organization enable new ways of social participation. One of them is cyber-activism in which young people use technology, especially the Internet, to organize activities, discuss, share information, participate and express their dissatisfaction on issues with which they identify themselves. De Ugarte (2007) adds that cyber-activism is all forms of social participation that occur via ICTs which are seeking to change the current situation through mobilization and militancy. This concept of cyber-activism has received several names, from click-activism, online activism, e-activism, digital activism, online activism, network activism, to digital social movements. However, just like participation, cyber-activism is horizontally organized around new issues and it looks for results such as changes in mentality. Based on a review of several authors who have researched these issues, Table 1 shows the similarities and differences between participation and cyber- activism and how commitment is perceived in both.

Having identified the main characteristics of participation, cyber- activism and the role that commitment plays, the aim of this study is to determine the number of students considered to be cyber activists in a university population, based on the following criteria:

a) Young adults who participate through signing, joining, or subscribing to causes, petitions or groups and to manage or share information (Cardoso, 2014; Castells, 2014; McCaughey & Ayers, 2003) related to the four selected topics.

b) Young people who report having a medium or high level of commitment to these issues.

c) Those who participate via Internet or in both places, online and on the streets.

All of the above criteria are related to the topics identified by theorists as related to cyber-activism which are: environmental, ecological and animal rights (Barranquero, 2012, Henríquez, 2011), social and civic issues (Castells, 2014; Henriquez, 2011), human rights (McCaughey & Ayers, 2003; Henríquez, 2011), and educational /academic issues (Castells, 2014; Henríquez, 2011).

Table 1. Similarities and differences between participation and cyber-activism based on commitment (Yanez, 2015)

Features	Participation	Cyber-activism
Affiliation	Young adults maintain individual dimensions or participate in lower-institutionalized groups.	No organizations apart from political parties and unions. Subjects act autonomously.
Site	Using new technologies.	Born and spread through the web, in some cases using cell phones. Occasionally consolidated in urban spaces or on the street.
Results	Immediate and/or mediate, priority to short-term effects.	The main result is to change people's minds and transform consciousness. Sometimes they can trigger protests, destabilization of institutions, or even changes in laws.
Organization	Horizontal working groups, round tables or networks. Reject unidirectional instances.	Leaderless, horizontal and direct interaction with others. No rigid rules and hierarchies.
Topics of interest	Citizen issues, social-and community issues, ecological and environmental issues, human rights, gender equality and sexual rights, labor, and culture.	Several topics based on the feelings experienced by the youth and its proximity to them. The strongest feeling is indignation.
Commitment	To participate actively is a way of demonstrating commitment.	Low or medium when only online interactions are present, high when actions are taken outside the web.
Motives	Causes supported by their peers.	Spontaneous, usually by feelings of indignation.
Main authors	Balardini (2005), Krauskopf (2000), Serna (1997), and Jenkins (2009).	Calderón y Szmukler (2014), Cardoso (2014), Castells (2014), and Henríquez (2011).

There is an important list of authors who have addressed the issue of political participation among citizens through the use of SNS and/or Internet to access political information, as in the case of the studies of Xenos and Moy (2007) on the US population, or those who have addressed the youth protests as a central element for political change, as in the case of studies carried out in Chile by Valenzuela, Arriaga and Scherman (2012) and in Mexico with the «Yo Soy 132» movement (Diaz, 2013). However, these studies have focused on the civic behavior and political education of young people, or have analyzed how these events influence electoral processes, election of candidates and their understanding of political parties. These authors have not been considered in this classification, nor has the criterion of political subject in carrying out the classification of young cyber-activists, considering that another approach and analysis is needed to deepen the political education of young people; thus, the authors referred to in the classification do not consider political issues as belonging to cyber-activists.

Young university students belong to a generation that has been characterized by the constant use of technology in their daily lives. Nonetheless, this study, and taking into account the points already mentioned, wants to determine what this participation, which is established by a sample of university students interacting with others through different technological means, is like. Specifically, the present study's main concern is to deepen and understand, what features do identified cyber-activists have in common? And what are the elements or turning points in the activities that they develop in the interaction with others that allows them to be presented as cyber-activists?

2. Methods and material

The method used for this study combines two types of techniques: a questionnaire with closed ended questions, and in-depth interviews. First, the questionnaire served as a starting point for selecting students with greater participation and medium-high level of commitment from a sample of students from the Universidad de Sonora (UNISON) which is participating in the project «Jóvenes y cultura digital. Nuevos escenarios de interacción social»[2] (Youth and Digital Culture: New scenarios of social interaction). The questionnaire section chosen for this work relates to the level of involvement and commitment young university students have with certain topics and online-platforms. The two questions asked were the following: Select the issues with which you have some kind of involvement and the level of commitment you have with this (these) topic(s)? On that question you can

select up to nine topics: 1) environment, ecology, and animal welfare, 2) educational/academic, 3) work and employment, 4) Artistic/Cultural 5) leisure, fun and entertainment, 6) Social and civic problems, 7) Human rights, 8) Political, and 9) Religious. The level of commitment that could be selected on this questionnaire by each subject was: high, medium, low, or none; the latter corresponding to no involvement or commitment at all.

To determine the students who showed traits of cyber- activism, the results of activities such as signing up to, joining or subscribing to causes, petitions, or groups, and managing or sharing information, having a medium or high engagement on these issues, involvement through Internet or both on the Internet and on the streets were also considered, all the latter related to topics such as the environment, ecology and animal protection, social and civic issues, human rights, and education/academic problems.

Out of the total sample from UNISON (713 participating students), only 13 met the established criteria.

The second technique was in-depth interviews following an interviewing guide also used in the previously mentioned project; under the design of a single case study. The main objective at this stage was that, through a narrative method, students explain how the process of interaction in networks and platforms takes place and to derive turning points[3] that can assist as categories of analysis for subsequent studies. The interview guide consists of 35 open questions, so that the interviewee could express his or her opinion freely. Even though the initial contact with the thirteen students was via email, only three of them replied. Despite the low participation among selected students, it was considered appropriate to continue the study because of the exploratory nature of this second stage, and the relevance of the responses obtained with the three participants.

3. Analysis and results

At first, after identifying the cyber-activist students (N=13), it is possible to point out that eight of them are female, and five are male and their ages range from 19 to 26. An important feature is that a large percentage of these students also work (9), while only four are entirely devoted to studying. From the department with the highest representation to the lowest, they were enrolled in the Schools of Social Sciences and Economics and Administrative Sciences (3 each), the School of Engineering (2), Biological and Health (2), and Humanities and Fine Arts with two students as well, while the least represented is the School of Natural Sciences with one student.

Inquiries about digital platforms used to protest showed that the SNS Facebook (named by all of them) is an important means for communicating and sharing information, inviting and/or calling for events, and even requests to join groups or other associations. They also indicated that they use email continuously (8), but employ newer platforms like Twitter (3) and Instagram to a lesser extent (1).

Regarding their affiliation, none of the Internet activists are incorporated into any organization or formal institution, but they participate as independent citizens.

Among the results perceived by this group of young adults the following are included: citizen awareness (6), followed by actions on the Internet (5), walking, creating documents or holding a demonstration to show discontent (2), and one reported having achieved the creation or modification of a law. Only one participant mentioned, as another type of result, upsetting others by writing that «offenses by ignorant people who believe that you are the ignorant».

By matching the four topics identified as theoretically related to cyber-activism with the level of commitment, it was found that there is a higher percentage of medium to high, as shown in table 2.

In a second stage, when examining the in-depth interviews conducted with three of these students (two men and a woman) the fact that they are studying and working stands out, besides from actively participating in online social networks. Their studies are under the social sciences umbrella and are senior undergraduate students (table 3).

The parents' level of education and socioeconomic status are two variables that indicate family capital regarding access to electronic goods from an early age, in this regard, educational level is located at HE level, highlighting that in two cases, where parents had asso-

Table 2. Subjects with cyber-activist characteristics' distribution related to commitment and to the topics they participate in (Yanez, 2015)

Level of commitment	Topics			
	Environment, ecology and animal rights	Educational/academic	Social and Citizenry issues	Human rights
High	38.5%	**38.5%**	23.1%	30.8%
Medium	46.2%	38.5%	53.8%	46.2%
Low	7.7%	15.4%	15.4%	23.1%

ciate degrees, an older brother had already reached a university level of education; second line relatives (uncles), or parents had university studies, leading to the suggestion that students belonging to this group are second generation higher eduation students. Regarding the socioeconomic status, they report being part of either middle or upper middle class, this means that although it is true that they do not belong to the upper class in the social stratification, their lives are characterized by having access to mobile phones with Android or iOS operating systems, as well as a desktop and a laptop computer. They are connected daily via cellphone and other devices, and especially have had easy access to Internet and computers from an early age.

Regarding the first category, interaction history, the following stands out: their first encounters with technology occur through video games and begin during childhood at home or with friends, school and internet cafés are the second place where they kept in touch with technology, stressing as a major factor that the high schools they attended promote active participation in topics of educational (one case), political (one case) and of general interest (one case).

Table 3. Characteristics of the interviewed cyber-activists

Interviewee	Bachelor degree program	Semester	Sex	Age	Employment situation	Economic Class	Number of topics of interest
1	Law	9	Man	24	Unemployed	Middle	6
2	Communication Sciences	10	Man	23	Employed	Middle	6
3	Communication Sciences	7	Woman	22	Employed	Upper-middle	6

In the category of active participation in social networks, there are several matching areas across the three students. They point out being aware that their participation is active on forums or wikis because they frequently give their opinions on the four topics (environment, education, citizenry and social issues, and human rights). However, each student mentions at least two more issues of participation and personal interest. For example, in the case of student 1, he adds the issue of politics and labor; student 2, added politics, religion, science and sports, and the third student repeats labor and scientific topics, adding arts and entertainment (games), so it is considered that altogether, there are at least six issues addressed by each of them (table 2). The interviewees confirm that they give their opinion on a frequent basis, especially on social problems that arise, as they are motivated primarily by the proximity of these issues to their lives. One of them states that it was a discomfort with a problem the student was facing which lead to his constant participation.

On the other hand, it is important to observe a critical stance in relation to the undergraduate program, because two of the students are in Communication Sciences making references, for example, to information management as for instance «there are several versions of the same news stories because reality can be interpreted in different ways».

Concerning the perception they have of their participation and impact on digital networks, the female student believes that the contribution made by feedback is valuable, while the two male students said they were not satisfied with such efforts, student 1 said in relation to the low response obtained from commenting online: «No, not completely. Because if what I write, I could..., the feelings I express in those words when I am telling all my acquaintances that something is wrong and only few people respond to that call or feel the same way that I do. Very few, I think that is why».

Meanwhile, student 2 expresses discomfort associated with the small amount of time devoted to this activity: «No. I feel I could contribute more, but for work reasons I cannot contribute more on social networks. Like I said, I get up, go online in the morning, the short break I have, say, at nine I start to ... I get up at eight and I have an hour or two, no more, that I can go online in the morning. I get back until five in the afternoon or so. And from five until ten or eleven, that's how long I have. And yes I would like to stay in touch longer».

However, all three agree on the importance of achieving change through an intensive interaction in digital social networks. They believe that if there were no ICTs, they would seek other forms of traditional active participation (newspapers, posters, murals, and demonstrations). Another point of view where the interviewees agree is that they do not approve of the laws of several countries seeking to control the Internet.

In relation to their affiliation to groups or organizations, one of them belongs to one and organizes different actions as a result. In reference to the perceived impact and consolidation of their actions, two students have acknowledged that their projects (group or per-

sonal) have extended to other national or foreign groups. One says that only a few projects have managed to become reality, but some others have not. However, the female student indicates that only group projects have actually become a reality, adding that with the actions taken they have managed to help the people concerned. Another student stated that the projects that have been successful have achieved informing people of the current situation.

Regarding the freedom with which they act in networks, the three students agree that they their work in digital social networks has not been censored. Yet, one interviewee indicates that, because of copyright, he did get censored. Concerning the laws of several countries seeking to control the Internet, two of the interviewees (a man and a woman) consider that freedom of speech would be violated. The third student indicates that part of society will cease to be informed of issues that may concern them. Finally, they agree that their work as a person involved in intense and frequent activity in digital social networks does not involve costs, so they see this as very convenient.

4. Discussion and conclusions

In general, it can be concluded that the young participants classified as cyber-activists can be found in any academic department, actively participating despite having to work and study at the same time in most cases. These young adults are enthusiastic about the work they perform through digital platforms because it revolves around topics of personal interest and considered as new issues.

Nevertheless, this participation, even when presented as active, involves a medium level of commitment, reflecting the few developed activities, i.e., they are active and involved in all topics, but not devoted or do not go into details about specific actions. Castells (2014) indicates that when young people participate in an online social movement or in a related activity, even when actively involved, their commitment is limited.

The way they organize is horizontal, meaning that it relies on their peers to organize and spread information, but does not have a vertical hierarchy with leaders who decide for them, they make decisions collectively and look for each voice to be heard. As evidence of this, it was found that very few subjects characterized as cyber-activists belong to an association or formal organization.

The use of Facebook as a central platform agrees with McCaughey and Ayer's (2003) proposal, who mention that activists, not just cyber-activists, have used the new types of media to promote movements, media that captures a larger number of potential participants. Also, Gil-de-Zúñiga, Jung and Valenzuela (2012) found that Facebook and social networks are used by all university cyber-activists to check the news, access alternative information or discuss with others about topics of interest, which could increase the commitment of individuals and their participation in community issues. In this sense, as stated by Garcia, Del-Hoyo and Fernández (2014), cyber-activism falls precisely into the possibilities for any individual to have a global impact through dialogue, as in the case of Facebook, not only as a means of communication, but also the means by which to carry out a form of social participation and global activism.

On the other hand, observing the results obtained and reported by this group of cyber-activists, this agrees with Krauskopf (2000) and Balardini (2005) on the participation and pursuit of immediate results. Also, Castells (2014) and Cardoso (2014) sustain that young people seek change of consciousness, not more profound changes.

The turning points that can be obtained from the in-depth interviews are: use of these tools at an early age through video games, also school, particularly high school, plays a very important role awakening interest in various topics, but this interest is also associated to the educational process in which students are engaged just as it is expressed through labor concerns (being young people who are about to graduate from university), scientific advances and caring for the environment as part of a general university culture, and sport and arts as their own personal interest associated with their age. In active participation in social networks, the right to speak freely, the use of electronic participation as a way to engage with causes, and non-affiliation to organizations when participating commonly stand out.

We also found that there is a presence of middle and upper middle class individuals, as stated by Hernández, Robles and Martínez (2013), that this phenomenon has a process of declassing, that is, the authors note how their motivation to participate is coupled with proximity to the topics, mainly where they perceive injustices such as job-related issues, where, as one of the participants said, there are low wages and exploitation of labor.

Overall, the interviewees have shown a critical view on the use of Internet. They agree that changes can be achieved interacting through social networks and disagree with countries' intention to control the Internet.

In conclusion and as a reflection, it is important to recognize that, within the limitations of qualitative stu-

dies using of interviews, generalization of these traits to other populations is low. This is commonly known, as what is gained in depth is lost in generalization, especially from claims that may arise when analyzing three students, from which it was intended to derive analysis categories for further studies.

However, once this limitation is recognized, it is important to note that this small group is part of a larger sample of 713 students, which has been systematically studied for the past three years. Thus, it is possible to affirm from these studies that, while only a small portion of this sample has characteristics of cyber-activists, the overall sample presents important features of active participation in the topics mentioned (González, Durand, Hugues, & Yanez, 2015), sharing similar traits to these thirteen students. This is the case in terms of high identification with digital culture, socioeconomic level ranging from middle to upper middle class, and good educational level in their parents being among the most significant elements (González, Hughes, & Urquidi, 2015). On the other hand, those of us who work with issues of social sciences know it is not easy to voluntarily obtain participation from young adults for several reasons, including the already-mentioned resistance to institutional participation and distrust in the use of personal information, or simply apathy about the usefulness of what they think and that others might use. These issues are not minor and have been consistently identified by other researchers.

Notes

[1] The term participation is understood and taken from the definition provided by Lima (1988) as a personal interactive process which is consensual and spontaneous for the common good, where it seeks to obtain a goal (usually the transformation of social relations), there is adherence to the ideas and values of a community, tasks, functions and roles within it are carried out.

[2] Project funded by the National Council of Science and Technology (CONACYT) in Mexico. Basic Science Call No. 178329 in charge of the technical direction of Dr. Delia Crovi. The questionnaire used is derived from this project and could be revised in Crovi y Lemus (2014).

[3] The concept of turning point was taken up from Yair (2009).

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The Influence of School Climate and Family Climate among Adolescents Victims of Cyberbullying

Influencia del clima escolar y familiar en adolescentes, víctimas de ciberacoso

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ABSTRACT

Cyberbullying is a phenomenon of growing social concern that affects an increasing number of children and adolescents from all the developed countries. Although there is a large body of literature on the relationships between school bullying and the family and school contexts, few studies have examined the influence of these social environments on the problem of cyberbullying. Using a quantitative methodology, the main objective of this study was to analyse the influence of the school and family contexts on victims of cyberbullying. The sample consisted of 1,062 Spanish adolescents (51.5% boys and 48.5% girls) from 11 to 18 years old (M=14.5; SD=1.62). Three comparison groups were formed: severe cyberbullying victims, moderate cyberbullying victims, and non-victims of cyberbullying. The results of the analysis of variance indicated that severe cyberbullying victims, compared to non-victims, scored significantly higher on family conflict and obtained lower scores on the remaining family (family self-concept, cohesion and expressiveness) and school (involvement, affiliation, and teacher support) variables considered in the study. Regression analyses revealed that academic and family self-concept and some dimensions of family and school climate predict cyber-victimization in adolescence. These new results point to the importance of including the family and the school in cyber-bullying prevention programs.

RESUMEN

El ciberacoso es un fenómeno de creciente preocupación social que afecta cada vez más a niños y adolescentes de todos los países desarrollados. A diferencia de la considerable literatura que hay sobre las relaciones entre el acoso escolar y el contexto familiar y escolar, todavía hay pocos trabajos sobre la influencia de estos entornos sociales en el problema del ciberacoso. Mediante una metodología cuantitativa, el objetivo principal del presente estudio fue analizar la influencia del contexto escolar y familiar en víctimas de ciberacoso. La muestra estuvo formada por 1.062 adolescentes (51,5% chicos y 48,5% chicas), de edades comprendidas entre los 12 y los 18 años (M=14,5; DT=1,62). Se establecieron tres grupos de contraste: cibervíctimas severas, cibervíctimas moderadas y no víctimas de ciberacoso. Los resultados del análisis de varianza indicaron que las cibervíctimas severas en comparación con las no víctimas puntúan significativamente más alto en conflicto familiar y obtienen puntuaciones más bajas en el resto de variables familiares (autoestima familiar, cohesión y expresividad), y variables escolares (implicación, afiliación y ayuda al profesor), consideradas en el estudio. Los análisis de regresión revelaron que la autoestima académica y familiar y algunas dimensiones del clima familiar y escolar predicen la cibervictimización en la adolescencia. Estos novedosos resultados muestran la importancia de incluir a la familia y a la escuela en los programas de prevención del ciberacoso.

KEYWORDS | PALABRAS CLAVE

Cyberbullying, adolescence, victims, Internet, mobile phone, school, family, self-esteem.
Ciberacoso, adolescencia, víctimas, Internet, teléfono móvil, escuela, familia, autoestima.

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1. Introduction and state of the matter

Greater access and use of new information and communication technologies (ICT) by adolescents involves new dangers (Durán & Martínez, 2015; Kowalski, Giumetti, Schroeder, & Lattanner, 2014), including cyberbullying. This type of peer bullying has been defined as an intentional and aggressive behaviour that is repeated frequently over a period of time through the use, by an individual or group, of electronic devices against a victim who cannot easily defend him/herself (Smith & al., 2008: 376).

Studies indicate that adolescent bullying through ICT has increased considerably in recent years (Fernández, Peñalva, & Irazabal, 2015). Thus, while Ybarra and Mitchell (2004) point to a prevalence of cyberbullying victims of 6.5%, almost ten years later Navarro, Serna, Martínez and Ruiz-Oliva (2013) find an incidence of adolescent cyber-victimization of 24.6%. For some authors, this increase in the prevalence of cybernetic bullying is due to the appearance and rapid expansion of new electronic devices, such as the smartphone, whose daily use is growing in the young population (Kowalski & al., 2014).

In addition, studies on the prevalence of cyberbullying according to sex are not conclusive. Some authors find a greater percentage of victims among girls (Beckman, Hagquist, & Hellström, 2013; Kowalski & al., 2014), while other authors find more victims among boys (Durán & Martínez, 2015), and still others observe no differences between the sexes (Katzer, Fetchenhauer, & Belschak, 2009). Regarding age, studies seem to agree that there are more victims of cyberbullying in lower secondary education (between 12 and 14 years old), with a decline in cyberbullying victimization in upper secondary education (between 14 and 16 years old) (Buelga, Cava, & Musitu, 2010).

Compared to the large body of literature on traditional school bullying (Pereda, Guilera, & Abad, 2014; Postigo, González, Montoya, & Ordóñez, 2013), few studies have examined other questions, such as the relationships between the school and family variables and cyberbullying. In the school setting, Tokunaga (2010) concludes that cyberbullying victimization causes the victim to experience a decline in academic achievement, to have less involvement in school tasks, experience attention problems and learning difficulties and greater school absenteeism. In addition to these academic problems, cyberbullying victims have a more negative perception of school, and they do not believe the teachers are able to help them solve their bullying problem. (Buelga, Ortega-Barón, Iranzo, & Torralba, 2014; Gradinger, Strohmeier, & Spiel, 2010).

This lack of confidence and support by adults also extends to their peers. Thus, Odaci and Kalhan (2010) show that cyberbullying victims have relationship difficulties with their classmates and experience greater isolation and social rejection from their peers, which contributes to maintaining the cyberbullying behaviour. Along these lines, Navarro, Ruiz-Oliva, Larrañaga and Yubero (2015) observe that children and adolescents with difficulties in their interpersonal relationships and poor social skills are more vulnerable to being cyberbullied by their peers. Thus, as occurs in traditional school bullying, there is a retroactive cycle involving risk factors and cyber-victimization continuity (Cava, Musitu, & Murgui, 2007; Kowalski & al., 2014).

Regarding the relationship between the family environment and cyberbullying, few studies have investigated this topic (D'Auria, 2014). Some authors suggest that there is a close link between a negative family environment and a reduction in adolescents' social and individual resources, making them more vulnerable to being mistreated and intimidated by their peers (Lereya, Samara, & Wolke 2013). According to Gomes-Franco and Sendín (2014), deteriorated or dysfunctional family links cause children to spend more time connected to the Internet in an attempt to replace family interactions or protest against them. Moreover, various studies point out that the exposure to situations of marital or family conflict are related to a greater tendency in the children toward hostility, antisocial behaviour and school violence (Buelga, Iranzo, Cava, & Torralba, 2015). By contrast, parental cohesion and social support are a favourable resource in the adolescent's social adjustment and development of positive relationships with peers, making it possible to avoid being the target of cyberbullying (Navarro & al., 2015).

From this perspective, taking into account that cyberbullying is a relatively recent and rapidly increasing problem in children and adolescents in all the developed countries (Kowalski & al., 2014), and that few studies have analysed, specifically and together, the relationships between cyberbullying and family and school variables (Taiariol, 2010), the objectives of the present study were: 1) To determine to what degree cyberbullying and the family and school variables are related to each other, also observing whether there are significant differences in the study variables based on sex; 2) To analyse the existence of possible differences between the groups of adolescents victimized (moderate and severe) and not victimized through cyberbullying on the variables of academic self-con-

cept, perception of the school environment (teacher support, affiliation and involvement), family self-concept, and the family environment (family cohesion, expressiveness and conflict); 3) To determine the predictive value of the school and family variables in cyberbullying.

2. Materials and methodology

2.1. Participants

The participants were selected through stratified sampling by clusters. The sampling units were the Secondary Education Public Schools in the Valencian Autonomous Community. The size of the sample of adolescents corresponding to the size of the group of students in Compulsory Lower Secondary Education (ESO) and Upper Secondary in the Valencian Community, with a sampling error of ±3%, a confidence level of 95%, and p=q=0.5, (N=190,773), was estimated at 1,061 students.

A total of 1,068 adolescents participated in this study, of whom six were excluded for responding systematically in the same way to the scales. Finally, the sample was composed of a total of 1,062 adolescents, 547 boys (51.5%) and 515 girls (48.5%) between 12 and 18 years old (M=14,5; SD=1.62), who were students at four public secondary schools in the provinces of Valencia and Alicante. In addition, 44.8% of the participants were enrolled in the first cycle of ESO (lower secondary) (n=475), 39.5% in the second cycle of ESO (upper secondary (n=420), and 15.7% in Pre-university studies (n=167).

> The cyberbullying victim's family self-concept is significantly lower than that of adolescents who are not victimized through ICT. The influence of the family seems, then, to be related to the problem of cyberbullying. In fact, our results show that the family environment, with the most weight, and the school environment predict victimization through the mobile phone and Internet. These findings corroborate the importance of the family and the school as protective factors against violent behaviour in the virtual environment, as they promote a greater feeling of security and strengthen the adolescent's emotional connection with significant adults.

2.2. Instruments

• Adolescent victimization through mobile phone and Internet scale (CYBVIC; Buelga, Cava, & Musitu, 2012). This scale consists of 18 items responded to on a Likert-type scale from 1 to 4 (never, seldom, often, and always). The items measure the bullying experienced through the mobile phone and the Internet in the past 12 months. Mobile phone victimization contains 8 items (for example, «Someone called me and hung up»), and Internet victimization is evaluated with the previous 8 items and 2 more items related to identity theft (for example, «Someone went into my private accounts, and I couldn't do anything about it»). In our study, the Cronbach's alfa reliability coefficient for the scale was .89.

• Intensity of mobile phone and Internet bullying scale (Buelga, Cava, & Musitu, 2010). The subjects use a 6-point response scale (never, only once, 2 or 3 times, once or twice a month, once or twice a week, and every day or almost every day) to indicate the severity with which they have been cyberbullied in the past year. The last four response options make it possible to measure moderate bullying (less than one aggression per week) and severe bullying (more than one aggression per week) (Smith & al., 2008).

• Form 5 Self-concept scale (AF-5; García & Musitu, 1999). For the purposes of the present study, the academic self-concept and family self-concept subscales were used to evaluate the subjects' responses in a range from 1 (completely disagree) to 99 (completely agree). The academic self-concept subscale is composed of six items that evaluate the adolescent's self-perception of his/her feeling of competence in the school setting (for example, «My schoolwork is good»). The family self-concept subscale contains 6

items that evaluate the adolescent's self-perception of his/her feeling of value in the family setting (for example, «I feel loved by my parents»). The Cronbach's alfa reliability coefficient obtained in this study was .89 for the academic self-concept subscale and .77 for the family self-concept subscale.

• Classroom Environment Scale (CES; Spanish adaptation by Fernández-Ballesteros & Sierra, 1989). The scale is composed of 30 true-false items that evaluate the adolescent's perception of the quality of the school environment. It consists of three subscales: perception of the teacher's support (10 items, for example, «Teachers take a personal interest in students »); affiliation: friendship and help among students (10 items, for example, « Students in this school make a lot of friends »); and involvement in schoolwork (10 items, for example, «The students take a lot of interest in what they do in class »). The Cronbach's alfa reliability coefficient in this study was .64 for the involvement and affiliation subscales, and .75 for the teacher support subscale.

• Family Environment Scale (FES; Spanish adaptation by Fernández-Ballesteros & Sierra, 1989). This scale is composed of 27 true-false items that evaluate the adolescent's perception of the quality of the family environment. It has 3 subscales: family cohesion (9 items, for example, «In my family there is a strong feeling of togetherness »); family expressiveness (9 items, for example, «We are usually careful about what we say »); and family conflict (9 items, for example, «In my family, we sometimes hit each other»). The Cronbach's alfa reliability coefficient in this study was .84 for the dimension of family cohesion, .79 for the dimension of family expressiveness, and .86 for the dimension of family conflict.

2.3. Design

The study design was non-experimental; specifically, we used a correlational cross-sectional design.

2.4. Procedure

Once the corresponding permission had been obtained from the selected schools, an informative seminar was held for the teachers and administration to explain the research objectives and request the parent authorizations.

Later, previously trained researchers administered the instruments to the adolescents during the school day, informing them at all times that their participation in the study was voluntary and anonymous. Their privacy was guaranteed, reducing any possible social desirability effects.

3. Results

The data were analysed with the SPSS statistical package (version 20). First, the subjects' scores on the Scale of intensity of mobile phone and Internet bullying were used to classify the adolescents in three comparison groups. According to the criteria by Smith and colleagues (2008), the subjects who score «2 or 3 times» and «once or twice a month» were distributed in the group of moderate victims (less than one aggression per week), while those adolescents who scored «once or twice a week» and «every day or almost every day» were classified in the group of severe victims (more than one aggression per week). The subjects who scored «never» were assigned to the group of non-victims. The subjects who scored «only once» were excluded from the comparison groups because there had been no repetition of the cyberbullying.

Once the comparison groups had been established, first, a Pearson correlation analysis was carried out to determine the relations between cyberbullying and the school and family variables being studied, and a Student's t test was performed to find out whether there are differences in these variables based on sex. Second, a one-factor ANOVA was performed to discover whether there were significant differences among the three comparison groups on the school environment variables (teacher support, affiliation and involvement) and academic self-concept, and on the family environment variables (family cohesion and family conflict) and family self-concept.

Third, a multiple linear regression analysis was performed of the predictive value of the school and family variables in the victimization through the mobile phone and Internet.

3.1. Frequency of cyberbullying victimization based on its intensity

The results of the study indicate, first, that 72.6% (n=731) of the adolescents have never been victimized through the mobile phone or the Internet, while 27.4% (n=276) have been victims of cyberbullying in the past year. Of these victims, 20.5% (n=218) belong to the group of moderate cyberbullying victims and 5.5% to the group of severe cyberbullying victims (n=58).

3.2. Relationships between cyberbullying and school environment, family environment and self-concept

The Pearson correlation analysis reveals statistically significant correlations between cyberbullying and all of the variables analysed in the study (table 1). Cyberbullying correlates negatively at $p<0.01$ with all

the school and family variables, and positively with family conflict.

As table 1 also shows, there are no statistically significant differences between the sexes in the cyberbullying variables, school involvement, affiliation, family self-concept, family cohesion and family conflict. By contrast, there are statistically significant differences between the sexes for academic self-concept (t=–4,87, p<.001), teacher support (t=–1,98, p<.05), and family expressiveness (t=–2,00, p<.05).

Table 1. Pearson correlations, means and standard deviations by sex and results of Student's t test

Variables	1	2	3	4	5	6	7	8	9
1. CB	-								
2. AS	-0.20**	-							
3. IMP	-.15**	.15**	-						
4. AFI	-.16**	.12**	.33**	-					
5. TS	-.12**	.18**	.33**	.26**	-				
6. FS	-.21**	.45**	.17**	.19**	.25**	-			
7. FCo	-.19**	.28**	.23**	.20**	.21**	.59**	-		
8. FE	-.13**	.22**	.14**	.10**	.10**	.37**	.41**	-	
9. FC	.12**	-.18**	-.11**	-.17**	-.13**	-.42**	-.50**	-.14**	-
M Boys	1.20	59.30	1.46	1.70	1.57	82.17	1.79	1.55	1.33
SD Boys	.28	21.51	.20	1.78	.22	16.54	.21	.20	.20
M Girls	1.66	65.82	1.46	1.7	1.60	83.96	1.79	1.58	1.32
SD Girls	.32	20.89	.21	1.80	.20	16.53	.22	.20	.19
T	-1.79	-4.87***	.52	-.02	-1.98*	-1.71	.54	-2.00*	.70

Note: CB=Cyberbullying; AS=Academic self-concept; IMP=Involvement; AFI=Affiliation; TS=Teacher support; FS=Family self-concept; FCo=Family cohesion; FE=Family expressiveness; FC=Family conflict; M=Means boys/girls; SD=Standard deviation; T=Student t test.
*p<.05. **p<.01, ***p<.001.

3.3. Differences in the perception of the school environment, family environment and self-concept based on the intensity of the cyberbullying victimization

In addition, the analysis of variance reveals the existence of statistically significant differences between the groups of severe and moderate cyberbullying victims compared to the non-victimized group of adolescents on all the school and family variables analysed in the study.

Thus, table 2 shows that on the academic self-concept variable, F (2, 1007)=9.27, p<.001, the severely victimized adolescents score significantly lower than the non-victimized adolescents, with differences between this latter group and the moderate cyberbullying victims, but not between the two cyberbullying victim groups. In the same way, statistically significant differences are observed in the three school environment dimensions, so that the severe cyberbullying victims, compared to the non-victimized adolescents, score significantly lower on involvement, affiliation and teacher support.

In the case of family self-concept, F (2, 1007)= 8.75, p<.001, and the family environment dimensions (cohesion, family expressiveness), the results indicate that the severely victimized adolescents score significantly lower than the group of adolescents who are not victimized through ICT. Regarding the family conflict variable, the results indicate that the severe victims of cyberbullying obtain significantly higher scores than the non-victims. There are no statistically significant differences between the moderate cyberbullying victims and the non-victimized adolescents or the severe cyberbullying victims on any of the family variables analysed.

Table 2. Differences between the groups (non-cyberbullying victims, moderate cyberbullying victims and severe cyberbullying victims) on the variables of school environment, academic self-concept, family environment and family self-concept

	Non cyberbullying victims		Moderate cyberbullying victims		Severe cyberbullying victims		F
	M	(SD)	M	(SD)	M	(SD)	
School variables							
Academic self-concept	64,03[b]	(21,39)	59,44[a]	(21,14)	53,55[a]	(19,72)	9,27***
School environment							
Involvement	1,48[b]	(.21)	1,42	(.19)	1,41[a]	(.18)	10,56***
Affiliation	1,72[b]	(.18)	1,67[a]	(.17)	1,65[a]	(.19)	7,47**
Teacher support	1,60[b]	(.21)	1,56	(.22)	1,52[a]	(.20)	9,75***
Family variables							
Family self-concept	84,36[b]	(15,46)	79,56	(18,23)	79,31[a]	(21,79)	8,75***
Family environment							
Family cohesion	1,80[b]	(.20)	1,76	(.24)	1,75[a]	(.24)	5,58**
Family expressiveness	1,58[b]	(.20)	1,55	(.19)	1,53[a]	(.23)	4,91**
Family conflict	1,31[a]	(.19)	1,33	(.21)	1,35[b]	(.19)	3,59*

Note: M=Mean; SD=Standard deviation; Fisher-Snedecor F=F; [*] Bonferroni Test.
a<b<c. *p<.05, **p<.01, ***p<.001.

3.4. Predictive value of the school and family variables in cyberbullying

Finally, the regression analysis confirms the predictive value of the school and family variables in cyberbullying. As table 3 shows, the school and family variables explain 6.2% and

9.7%, respectively, of victimization through the mobile phone and Internet.

Specifically, the table shows that academic self-concept (β=–.170; p= <.001), teacher support (β=–.081; p= .017), and the feeling of affiliation (β=–.103; p= .002) are some of the statistically significant explanatory variables, while the involvement in schoolwork variable was not significant.

Table 3. Multiple linear regression analysis using cyberbullying as the criterion variable

Predictor variables	R2 Corrected	F	β	p
School context	.062	12,58		
Academic self-concept			-.170	<.001
Teacher support			-.081	.017
Feeling of affiliation			-.103	.002
Involvement in schoolwork			-.031	.346
Family context	.097	31,34		
Family self-concept			-.135	<.001
Family cohesion			-.235	<.001
Family expressiveness			-.041	.239
Family conflict			.114	<.001

Note: R^2=Squared multiple correlation; Fisher-Snedecor F=F; β=Beta; p=α=.05.

Regarding the family variables with a higher predictive value than the school variables, the results show that, with the exception of the family expressiveness dimension, the variables family self-concept (β= –.135; p=<.001), family cohesion (β=–.235; p= <.001), and family conflict (β=.114; p<.001) explain part of the variance in cyberbullying.

4. Discussion and conclusions

The main objective of this study was to analyse the relationships between family and school variables in understanding the problem of cyberbullying (Buelga & al., 2012; Kowalski & al., 2014). A large body of literature confirms the influence of the family and school contexts in the problem of traditional school bullying (Cava, 2011; Navarro & al., 2015; Pereda & al., 2014). From this perspective, taking into account that few studies have addressed this question in the area of cybernetic bullying, the focus of our study was to explore the existence of these relationships in the new and growing problem of cyberbullying.

Before examining this main proposal, the results of our study revealed that 27.4% of our sample had been victims of cyberbullying in the past year. These data coincide with recent studies that obtain a prevalence of cyberbullying victimization of between 25 and 30% (Erentaite, Bergman & Žukauskiene, 2012; Navarro & al., 2013). In addition, coinciding with the study by Taiariol (2010), our data confirmed that the cyberbullying was significantly related to the school and family variables examined in this study. The data indicate that the victims of cyberbullying, compared to the group of non-victims, present worse adjustment on all the school and family variables analysed. Thus, regarding the school setting, the results suggest that the adolescents who are moderate and severe victims of cyberbullying have a significantly lower academic self-concept than the non-victimized adolescents, as well as a significantly diminished feeling of affiliation with their peers. These data are coherent with the studies by Ybarra, Mitchell, Wolak and Finkelhor (2006), and by Tokunaga (2010), who observe a decline in the school performance of cyberbullying victims and higher rates of school absenteeism. They also coincide with classic studies on school bullying that have consistently shown the negative effects of this type of violence on the victim's school adjustment (Bradshaw, Waasdorp, & Johnson, 2014; Cava & al., 2007). Moreover, also agreeing with Varjas, Henrich and Meyers (2009), our results reveal that severe cyberbullying victims have a more negative perception of the teacher's support. In this regard, Kowalski and Limber (2013) point out that cyberbullying victims do not perceive the teacher as a source of authority and help in solving their bullying problems with their peers. This lack of confidence in teachers reveals the need to include them in intervention programs that can offer resources to participate effectively in solving the problems of school bullying and cyberbullying.

Furthermore, our results indicate, as could be predicted based on the mistreatment they are experiencing, that severe cyberbullying victims perceive less help and friendship from their classmates. This perception has been associated with cyberbullying victims' greater feelings of loneliness and generally more negative perceptions of friendships with peers (Buelga & al., 2014; Smahel, Brown, & Blinka, 2012). For adolescents, being popular, accepted and recognized by their peers is fundamental in this stage of the life cycle (Garandeau, Lee, & Salmivalli, 2014). Therefore, cyberbullying becomes an especially painful experience for their personal and social identity, and this is made worse when the quality of their family relations is also negative (Lereya & al., 2013).

In fact, our data also seem to confirm that severe

cyberbullying victims have more family conflicts, less family cohesion and less family expressiveness than adolescents who are not involved in cyberbullying. As pointed out by Postigo and others (2013), the negative quality of the family environment can be a risk factor that contributes to the adolescent being an easy target for mistreatment and intimidation by classmates, due to a lack of family resources to protect him/her from the violence. The results of this study show that the family plays an important role in minimizing the risks on the Internet (Sureda, Comas, & Morey, 2010), as a deterioration in the quality of the family environment contributes not only to greater vulnerability to being victimized, but also to a longer duration of the cyberbullying because of a lack of family support to deal with the problem (Navarro & al., 2013). In reality, it is in the home where adolescents learn values and norms of co-existence (Marín-Díaz & García-Fernández, 2003). Therefore, parents have to foster positive communication, not only at home, but also in the virtual world where their children navigate. As our results also suggest, the cyberbullying victim's family self-concept is significantly lower than that of adolescents who are not victimized through ICT. The influence of the family seems, then, to be related to the problem of cyberbullying. In fact, our results show that the family environment, with the most weight, and the school environment predict victimization through the mobile phone and Internet. These findings corroborate the importance of the family and the school as protective factors against violent behaviour in the virtual environment, as they promote a greater feeling of security and strengthen the adolescent's emotional connection with significant adults (Solecki, McLaughli, & Goldschmidt, 2014). Part of the cyber-victimization problem would depend, therefore, on the quality of the adolescents' relationships with the most significant people in their social environment (parents, teachers, and peer group). In addition, the role of parents and teachers is fundamental, as the best way for them to truly help the adolescents is by training and educating them about how to avoid and control the risks that exist online (Tejedor & Pulido, 2012). In summary, this study, like any other scientific study, has some limitations. The cross-sectional design keeps us from establishing a relationship of causality among the different variables considered in the study, so that it would be interesting to carry out longitudinal studies to examine the results obtained more closely. Likewise, the adolescents' responses on the self-reports could have social desirability effects and biases, although on this point the reliability and validity of the adolescents' self-reports to measure risk behaviours have been shown to be acceptable (Buelga & al., 2012; 2015).

However, and in spite of the limitations, this new and pioneer study contributes suggestive ideas for future studies. For example, both the family and the school should be included in cyberbullying prevention programs, and quantitative methodology should be combined with qualitative techniques to examine the problem of cyberbullying from the perspective of parents, teachers and adolescents more closely. This, in turn, would favour the development of effective programs to prevent and reduce this growing worldwide problem of peer bullying through ICT.

Part of the cyber-victimization problem would depend, therefore, on the quality of the adolescents' relationships with the most significant people in their social environment (parents, teachers, and peer group). In addition, the role of parents and teachers is fundamental, as the best way for them to truly help the adolescents is by training and educating them about how to avoid and control the risks that exist online.

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Discriminatory Expressions, the Young and Social Networks: The Effect of Gender

Expresiones discriminatorias, jóvenes y redes sociales: la influencia del género

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ABSTRACT
In the framework of the «Project I: CUD» (Internet: Creatively Unveiling Discrimination), carried out in the United Kingdom, Italy, Belgium, Romania and Spain, we conducted a study into the expressions of discrimination used by young people on social network sites. To do so we designed a methodological strategy for detecting discriminatory content in 493 Facebook profiles and used this strategy to collect 363 examples for further analysis. Our aims were to compile information on the various types of discriminatory content and how they function online in order to create tools and strategies that can be used by trainers, teachers and families to combat discrimination on the Internet. Through this study we have detected patterns between young men and young women that reveal that there is a feminine and a masculine way of behaving on the Internet and that there are different ways of expressing discrimination on social networks sites. Men tend to be more direct in their posting and sharing of messages. Their messages, which are also more clearly discriminatory, focus more on discrimination towards ethnic groups and cultural minorities. Women, on the other hand, tend to use indirect (reactive) discriminatory strategies with a less obvious discriminatory component that mainly focuses on sociocultural status and physical appearance.

RESUMEN
En el marco del Proyecto «I:CUD» (Internet: Desenmascarando la discriminación creativamente), llevado a cabo en el Reino Unido, Italia, Bélgica, Rumanía y España, hemos desarrollado una investigación sobre las expresiones de discriminación utilizadas por los jóvenes en las redes sociales. Para la realización de esta investigación, se ha diseñado una estrategia metodológica de detección de contenidos discriminatorios en 493 perfiles de Facebook que ha permitido encontrar 363 ejemplos para su análisis. El objetivo de la misma ha sido la obtención de información acerca de los tipos de contenidos discriminatorios y su forma de funcionamiento on-line, para facilitar la creación de herramientas y estrategias para luchar contra la discriminación en la Red, y su utilización por parte de formadores, docentes y familias. Como resultado, hemos detectado algunos patrones diferenciales entre hombres y mujeres jóvenes que nos permiten afirmar la existencia de una forma femenina y otra masculina de comportarse en Internet y un uso diferencial de las redes sociales en relación con la discriminación. En cuanto a ésta, los hombres tienden a tener más actividad directa (publicando y compartiendo mensajes), con contenidos más claramente discriminatorios y, sobretodo, centrados en la discriminación hacia grupos étnicos y minorías culturales. Las mujeres, por su parte, tienden a utilizar estrategias de discriminación no directas (reactivas), con una menor evidencia del componente discriminatorio. Ellas, mayoritariamente, dirigen las actitudes discriminatorias hacia la situación sociocultural y la apariencia física.

KEYWORDS | PALABRAS CLAVE
Attitudes, virtual communities, discrimination, gender studies, Internet, youth, social network sites, sociology.
Actitudes, comunidades virtuales, discriminación, estudios de género, Internet, jóvenes, redes sociales, sociología.

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1. Introduction and state of the question

Our research focused on compiling information about different types of discriminatory content and their online presence. Our main aim was to detect differences between behavioural patterns on Facebook (our sample SNS) in an attempt to further our understanding of how discriminatory content is transformed on SNS and its patterns disseminated. Having obtained information about young people's[1] behaviour, our next step was to give practical advice to create tools or strategies to fight against discrimination and its expressions on the Net.

To this end, in the I:CUD project, we defined the concept of digital discrimination as the representation of discriminatory content and attitude by digital means. This definition implies that digital discrimination represents not a new reality, but a new way of expressing and disseminating discriminatory content.

1.1. Social networks: paths for interaction

As a starting point we would like to contextualize the research in the general framework of SNS and Internet sociability. For Schneider & al. (2009) and Rambaran & al. (2015), an online social network is a community of individuals who share interests, activities, experiences and/or friendship. Most networks are available on the Web, and users can publish profiles with text, image and video, and interact with other members. The research conducted by Garton, Haythornthwaite & Wellman (1997) shows that virtual communities can be understood as relational communities in which sociability has quantitative and qualitative patterns that are different from those of classical physical sociability. For Quan-Haase & Wellman (2002) and Haythornthwaite & Wellman (2002), communities created around the Internet are «personal communities» (communities based on individual interests and affinities between people who decide to connect).

SNS make new interactions possible and, therefore, help to create new forms of sociability. Martuccelli (2002), for example, states that the Internet is a strong support in the process of individuation. For many users, the main purpose of the World Wide Web is to create contacts (Kadushin, 2013), and SNS increase the individual social capital of young people (Ellison, Steinfield, & Lampe, 2007). Even so, some researchers conclude that the Internet and SNS help to create weak relational ties, quite unlike the strong ties[2] created in other fields of socialization (Haythornthwaite, 2005). Far from being a negative feature of networks, this is its distinctive mark: networks make it possible to create infinite weak contacts, but it is also useful for strengthening those strong ties created in offline relations. Likewise, Castells (2001) concludes that this ongoing tendency decreases physical community-based sociability. Other researchers (Steffes & Burgee, 2009) have shown that people who are connected through SNS have homophile relations, different tie strengths and similar decision-making patterns. The behavioural patterns in small-medium relational circles are similar and the number and intensity of the interpersonal links strengthen these patterns (Centola, 2015). Stefanone & Jang (2007) concluded that the main personal attitudes and skills that lead to using blogs are the same as those that are required to maintain strong-tie networks: extroversion and self-revelation. On the other hand, they concluded that age, gender and educational level are not correlated to network size, blog content or the use of blogs to maintain relations and strong ties.

Wellman & al. (2001) proved the correlation between bigger physical social networks and Internet use. This is what they define as «the more, the more». And the opposite is also true: the more individuals use Internet social networks, the more they will use offline networks. Boyd (2007) has studied the potential audiences technologies can have. These audiences help to develop the properties of technology and the applications that are derived from it. According to Boyd, the audience is partially determined by the following features: 1) persistence, 2) searchability, 3) reproducibility and 4) invisible audiences. These features help to understand the Internet as a double-edged sword if you are not discerning enough to distinguish between the contents that are being transmitted. Those contents are persistent, but they are also easily reproducible. They are often inaccurately summarized or generate stereotyped versions of the initial contents, reaching the invisible audiences that Boyd described. Joinson (2003) underlined the synchrony created by the swiftness in which individuals enter into conversation on the net. Internet helps to create constant interactive situations and opportunities because of the low connection costs, the ease in which computers and applications can be reached, the anonymity of the connection and the possibility of enjoying privacy in a conversation with multiple speakers. Joinson also warns of the quandaries associated with the fraudulent use of net content and the negative impacts of anonymous criminal behaviour. However, he describes the paradox of the coexistence of research that shows that the Internet helps both to desocialize people and to strengthen preexisting relational and social skills. For

him, the Internet can help to share life's experiences and vicissitudes, and can be a practical self-help platform for problem solving and finding company in difficult situations. He concludes that there are benefits in virtual communities and websites, from both the emotional point of view, and the point of view of information exchange.

1.2. Theoretical framework: Women and men on the Net

1.2.1. Is there a masculine and a feminine way of interacting in SNS?

The number of Facebook users is estimated to be three times the number of inhabitants of the US. At the end of 2012, Facebook had 800 million users around the world. A total of 65% of North-American adults had entered a profile in some sort of SNS and 92% of these profiles had been created on Facebook. Of the young users of Internet, 80% are active users of SNS, and over half of these write and send messages regularly through networks (García, Alonso, & del-Hoyo, 2013). It is estimated that 75% of Internet users under the age of 25 have an SNS profile (Lenhart, 2009). It is undeniable then that the use of SNS is gaining enormous importance in teenagers' lives.

In the Spanish case, 93% of young people between 11 and 20 years old take part in SNS (Urueña & al., 2011; Fundación Pfizer, 2009). This high percentage of SNS use can be understood as an indicator of the ongoing revolution in the ways young people communicate, but it also means that their process of socialization is different. Although the framework of socialization used to be the family and school, it has now extended to include social networks. As many authors have stated, networks have a great impact on socialization, particularly on gender socialization (Gómez, 2010; Huffaker & Calvert, 2005; Bortee, 2005; Thelwall, 2008). Therefore, gender, sexuality and identity are becoming more and more open and Internet gender socialization is a new way of socialization that is based on a modern definition of gender and revolves around the concepts of fluidity, construction and performance. Although Livingstone & al. (2014) focused on kids' online behavior (9 to 16) and found few differences between the tastes and interests of girls and boys, Bringué & Sádaba (2011) obtained interesting results on gendered approaches to online activity: teenage girls are keener than boys to surf the net with friends, teachers or parents.

Social networks are a necessary socialization space for contemporary youngsters: they have become places where they can meet and get to know each other, introduce and represent themselves, build their identity, share their hobbies and tastes, and learn new skills and abilities that help in their personal and social development. Contemporary youth cannot be understood without taking the transformative power of the Internet into account. SNS have become an environment for exploring self-identity and for the self-representation of young people (Tortajada, Araüna, & Martínez, 2013; Stern, 2004; Manago & al., 2008).

> SNS act as loudspeakers that give visibility to attitudes that are common in young people and that used to be expressed only in a physical and individual way. SNS record these attitudes in a public or semi-public way, making the content available to a wider range of people and lasting over time. When young people post content, the pattern of expression is still determined by our oral face-to-face tradition. They do not generally think that these contents do not follow the same rules and need longer reflexive processes to avoid possible impacts on other people or their own future.

Espinar & González-Río (2009: 88) state that there is little information available about the new phenomena of SNS on the Internet and its use by young people. In particular, there is little data on the different possible uses made of them by men and women. They also point out that the differences between men and women are not linked to how much, but to how they use Internet.

As far as interaction is concerned, Valkenburg, Schouten, & Peter (2005) analyzed the different stra-

tegies of self-representation that are used by the different genders when preparing their personal pages on the Internet. Men tend to emphasize their status, capacities and competences, and generally use shapes and icons linked to technology. For their part, women tend to present themselves as nice and attractive, and use drawings of flowers and pastel colours. In their study, after analyzing 609 teenagers, they concluded that 50% of the young people interviewed changed their identity. Younger teenagers were keen to alter or transform identity, and some gender differences were detected in the changes made: men tended to reinforce masculine stereotypes, while women tried to adopt adult attitudes and transform their physical appearance.

1.2.2. Gender system and SNS

Masculinity and femininity are core concepts in the definition of the gender system. They involve the values, experiences and meanings that are associated with women and men and which define feminine and masculine images. These notions change from one period to another and from one culture to another, but they are expressed in every particular situation through beliefs and expectancies (Alvesson & Billing, 1997). Gender, then, is a social construct not a natural quality. It is organised hierarchically and legitimates different treatment for men and women. The distinction between sex and gender represented an important break from the functionalist paradigm of traditional sexual roles, and allowed feminists to explore the cultural basis of sexism (Amorós, 1994; Valcárcel, 1994).

The origin of the concept of gender can be found in the work of Rubin (1975). From the very beginning, gender theory suggested that there was a difference between sex and gender. Sex is understood as a biological category linked to individual chromosomes and expressed in genital organs and hormones. Gender, on the other hand, is associated with a complex set of social processes that create and maintain differences between men and women.

The gender system makes it possible to understand a model of society in which biological differences between men and women are translated into social, political or economic inequalities between sexes, with women being the more disadvantaged (Rubin, 1975). These elements of the gender system contribute to the creation of omnipresent structures that organize human behaviours and social practices in terms of differentiation between men and women (Bourdieu, 2000; Fenstermaker & West, 2002). In other words, this system helps to produce two different types of person: women and men. Women develop as they do because they have a shared assumption of what being a woman means. The same can be said of men. These beliefs are not created ex novo: they are linked to predominant cultural ideologies (Alvesson & Billing, 1997; Deaux & Stewart, 2001). The messages about gender come from diverse and fragmented sources that are often contradictory: society, subcultures, organisations, family, school, media or individuals. As a result, gender identity can have multiple forms and often conceals considerable ambivalence. Individuals can choose whether to accept or reject these cultural associations in their own thoughts, actions and self-comprehensions (Deaux & Stewart, 2001). The social definition of men as power owners, for example, can be translated into an image of masculinity tied not only by beliefs, behaviours and emotional states, but also by physical strength or the body positions adopted by men. This example shows how male power can be understood as part of the natural order (Connell, 1993; Valcárcel, 1994). In contemporary societies, hegemonic masculinity (Connell, 1993) tends to emphasise authority, autonomy and self-sufficiency, while idealised femininity is linked to the satisfaction of men's desires. Obviously these images do not necessarily correspond to what most women and men are, but large numbers of people share these ideas. Connell (2002) described other forms of masculinity: the subordinated masculinities that are based on their identification with femininity. The range of forms that masculinity adopts is partially determined by the interaction between gender and such other variables as ethnic group or social class (Curington, Lin & Lundquist, 2015).

2. Materials and method

Our research took place between December 2012 and November 2014 in five different cities at the same time: and Barcelona/Tarragona. The methodological framework provided information about how discriminatory expressions are, consciously and unconsciously, transformed to adapt to the Internet environment.

The methodology consisted of a discourse analysis of the contents collected after creating 15 profiles (three per city) and 50 friends per profile (table 1). These three profiles were constructed in accordance with the position of the participant in the educational system (university student, secondary-school student and NEET [Not in Education, Employment or Training]). To ensure that participants could freely take part in the project and that they were aware of what participation involved, each new «friend» recei-

ved a message from the profile with information about the project and the methodology and a guarantee of data protection.

The final number of participants was 493. The final sample is made up of 65% women and 35% men (table 2). Many factors may contribute to this higher ratio of women in our sample: they may be closer to the organisations that participate in the project or they may be more willing to participate in a project on discrimination issues. Ultimately, however, these values are similar to the gender distribution in Facebook (Dugan & Brenner, 2013). As far as age is concerned, most of the sample members are concentrated between 17 and 24 years old. Even the concept of young is wide and undefined at the extremes but, generally, this period in life is between 16 and 30 years old.

Table 1. Profile information

	Group			
City	NEET	Secondary School	University	Total
Brussels	16	15	29	60
Tarragona/Barcelona	9	15	68	92
Rome	38	62	75	175
Bucharest	2	96	21	119
London	22	8	17	47
Total	87	196	210	493

Table 2. Gender distribution

	Gender		
City	Women	Men	Total
Brussels	31	29	60
Tarragona/Barcelona	77	15	92
Rome	118	57	175
Bucharest	74	45	119
London	21	26	47
Total	321 (65%)	172 (35%)	493 (100%)

We checked the information that these 493 participants were posting on Facebook in order to detect content or activities that could be regarded as discriminatory. Every item that we found was described and categorized. Following this methodology we finally collected, described and categorized 363 examples of discriminatory content.

We asked the researchers to evaluate the intensity of discriminatory content with a subjective Likert scale from 1 (slightly discriminatory) to 5 (highly discriminatory). We carried out an internal consistency test to check the dispersion of results of the various researchers, who are members of NGOs devoted to discrimination prevention. The Rho Spearman test highly correlated between all the members of the research team (for 9 of 10 possible combinations), which pointed to a high internal consistency in the evaluative criteria used by the research team and validated the discrimination scale as an analytical variable.

3. Analysis and results

3.1. Discriminatory intensity

We found significant differences when crossing the data of the discrimination scale. The discriminatory content posted by the NEETS and the secondary school pupils was significantly more intense than the content of the university group. Likewise, examples of discrimination posted by women are considered to be significantly less discriminatory than those posted by men. These data indicate that differences depend on educational level and gender. Young men are the group that is expected to be the most discriminatory and university women the least (table 3).

The chi-square test gave significant results when gender was crossed with the discrimination scale (42.5 and α=0,000 for a 95% significance level) and with the type of discrimination (66.8 and α=0,000 for a 95% significance level).

Some of the types of discrimination on the discriminatory scale were rated as highly discriminatory (for example, ethnic or religious). Gender discrimination occupied a medium position, while discrimination of physical appearance, socio-cultural class or homosexuals appears to be easily concealed. In general these types of discrimination are considered to be highly incorrect or aggressive in society and are the same as the types that are considered to be most discriminatory. It must be assumed that the researchers' process of evaluation ultimately depends on the subjective approach that individuals have to the reality analysed, and those elements that are generally considered to be highly discriminatory tend to be reproduced. It is easy to regard some types of discrimination as strong but this merely points to the need to work with types of discrimination other than «the traditional ones», which need to be much more aggressive if they are to be considered in the same way. This unconscious difference between different types of discriminatory attitudes can give some clues to understanding how some content is easily disseminated. Facebook enables some content to be tagged as inappropriate and deleted, but if users only detect traditional forms of discrimination, the rest can easily survive.

Tables 3 and 4 show that discrimination is greatest on gender issues. There are significant differences between the way in which boys and girls use discriminatory content: boys are more focused on gender discrimination and more aggressive in their comments. Girls, on the other hand, focus more on physical appearance

Table 3. Level of discrimination according to gender						
	Discrimination scale					
Gender	1	2	3	4	5	Total
Women	32	55	46	43	21	**197**
Men	3	25	34	58	40	**160**
Total	35	80	80	101	61	**357**

and social class, which are «lighter» forms of discrimination according to our scale. To further classify individual attitudes to discrimination, we created categories to describe how young people were disseminating discriminatory content and comments:

a) «Like» to discriminatory comments made by others.

b) «Like» to discriminatory content posted by others.

c) Discriminatory comment made by him/herself.

d) Discriminatory comment made by others on his/her wall.

e) Link to discriminatory content posted by him/herself.

f) Other option.

In an attempt to apply the principle of parsimony (provide the simplest explanations possible without losing information), we decided to reduce those categories to three, depending on who is taking the action:

a) Direct discrimination: the users themselves create/post the content.

b) Indirect discrimination: the users accept/agree with discriminatory content, and help to spread it by their action.

c) Other options.

These new categories show that attitudes depend on the participant's gender and the group they are in (table 5 and 6). Secondary-school students, NEETS and men tend to create or publish contents on their own, while university students and women tend to accept comments published by others. This difference reinforces the idea that men and women have different attitudes towards content and makes it possible to define masculine and feminine patterns of «facebooking».

Finally, the holistic analysis of the data presented above suggests the existence of multiple correlations among the variables in the system. To obtain information about the significance and direction of these multiple relations, we developed a multiple correspondence analysis[3].

The results reveal that two variables (gender and type of discrimination) explain 85.8% of the model variance (table 7). The correlation of the variables with the two dimensions resulting from the ACM are significant. The first axis is defined by direct/indirect discrimination and intensity, and can be understood in terms of gender differences. The second axis is defined by the type of discrimination. These results are important as they reveal that men are associated with aggressive, direct discriminatory content that is focused on ethnic, gender and religious issues. Women's attitudes are less aggressive, indirect and focused on physical appearance, sociocultural class and homophobic issues.

4. Conclusions and discussion

As Bernárdez-Rodal (2006: 81) states «the dichotomous structure of genders around the masculine and feminine axes neither disappears nor changes, even when conditions are ideal. Despite interacting in

Table 4. Level of discrimination in relation with the type of discrimination (%)						
Type of discrimination	Discrimination scale					Total
	1	2	3	4	5	
Appearance	7	9	6	3	2	n = 27
	25.9%	33.3%	22.2%	11.1%	7.4%	100.0%
Cultural minorities	0	1	1	9	1	n = 12
	0.0%	8.3%	8.3%	75.0%	8.3%	100.0%
Disabled people	1	8	0	3	0	n = 12
	8.3%	66.7%	0.0%	25.0%	0.0%	100.0%
Ethnic	3	6	13	25	23	n = 70
	4.3%	8.6%	18.6%	35.7%	32.9%	100.0%
Gender	12	14	33	41	20	n = 120
	10.0%	11.7%	27.5%	34.2%	16.7%	100.0%
Homophobia	2	9	4	2	4	n = 21
	9.5%	42.9%	19.0%	9.5%	19.0%	100.0%
Religion	2	5	2	5	6	n = 20
	10.0%	25.0%	10.0%	25.0%	30.0%	100.0%
Sociocultural class	4	17	18	6	4	n = 49
	8.2%	34.7%	36.7%	12.2%	8.2%	100.0%
Stereotypes	0	8	3	5	0	n = 16
	0.0%	50.0%	18.8%	31.3%	0.0%	100.0%
Other types	4	4	1	2	1	n = 12
	33.3%	33.3%	8.3%	16.7%	8.3%	100.0%
Total	35	81	81	101	61	n = 359
	9.7%	22.6%	22.6%	28.1%	17.0%	100.0%

Table 5. Direct or indirect discrimination in relation to the group				
	Group			
Type of discrimination	NEET	Secondary School	University	Total
Non-direct	32	34	138	204
Direct	36	35	40	111
Others	15	28	4	47
Total	83	97	182	362

Table 6. Direct or indirect discrimination in relation to gender			
	Gender		
Type of discrimination	Women	Men	Total
Non-direct	146	57	203
Direct	45	66	111
Others	8	38	46
Total	199	161	360

cyberspace, the body is still important. In one way or another, interaction still takes place through it». The fact that the Internet allows you to abandon your body has been considered, at least by some feminist theorists, as an opportunity for feminine liberation, because women have been so subject to its corporeality. However, no teenagers, neither boys nor girls, seem to wish to do so. Gender determinism is still fundamental, and when «body» is not present, «word» takes its place.

We have shown that boys and girls express themselves differently when they are interacting on Facebook in three different ways: 1) the type of discrimination, 2) the scale of discrimination and 3) the way they produce these discriminatory expressions. We have also combined all these variables to find multiple correspondences between masculine and feminine patterns of behaviour on SNS and also significant differences. These differences are so important that it seems that males and females behave differently on the Internet and have different approaches to discrimination on social networks. Likewise, Mascheroni, & Ólafsson (2014) showed differences in terms of the approach to privacy: men are more likely to have public profiles, while women tend to have private ones.

Boys tend to make discriminatory comments about ethnic origin, gender issues and cultural minorities, while girls focus on physical appearance and social class. The discriminatory comments of men have been labelled as more intense on the discrimination scale, particularly the comments linked to gender; on the other hand, women make lighter comments. In summary, men use direct discriminatory attitudes, while women use indirect ones.

In general, discrimination tends to be understood and scaled in terms of the topic or the collective focus of its impact, as some categories or groups are more easily identified than others. Discrimination for ethnic origin and gender –especially the former– has traditionally been the objective of several campaigns to raise awareness about what it involves. Meanwhile, other types of discrimination have been socially accepted or have remained invisible (for example, social class or appearance). In this research, we have underlined the importance of sex differences for understanding discriminatory attitudes. The intensity, type and way in which discrimination is expressed and reproduced can be tied to sex. Men's tendency to have more discriminatory attitudes on the three levels can be understood as a pattern of affirming masculinity during youth.

We should point out that this research does have some weaknesses (for example, the delimitation of some concepts or the limits of the object of study). Therefore, the issue of how youngsters and teenagers are using SNS needs to be further investigated. It is particularly necessary to carry out ethnographic research to analyse how boys and girls behave on the Net, and how language and power are used.

Finally, we should not forget that SNS act as loudspeakers that give visibility to attitudes that are common in young people and that used to be expressed only in a physical and individual way. SNS record these attitudes in a public or semi-public way, making the content available to a wider range of people and lasting over time. When young people post content, the pattern of expression is still determined by our oral face-to-face tradition. They do not generally think that these contents do not follow the same rules and need longer reflexive processes to avoid possible impacts on other people or their own future.

Notes

[1] The young people were informed about what their participation involved, in accordance with the legislation of each of the participating countries.

[2] The concepts of weak and strong ties were developed as a tool to describe interpersonal relations in networks. Granovetter (1973) described the strength of an inter-individual tie as a combination of the amount of time, the emotional intensity, the intimacy and the mutual services that characterise the relation. He also underlines the leading role that weak ties play in promoting integration and in constructing community. For this author, weak ties are indispensable for individual opportunities.

[3] The aim of MCA is to help to reduce the complexity of the holistic analysis by gathering data into simple patterns of interpretation. It

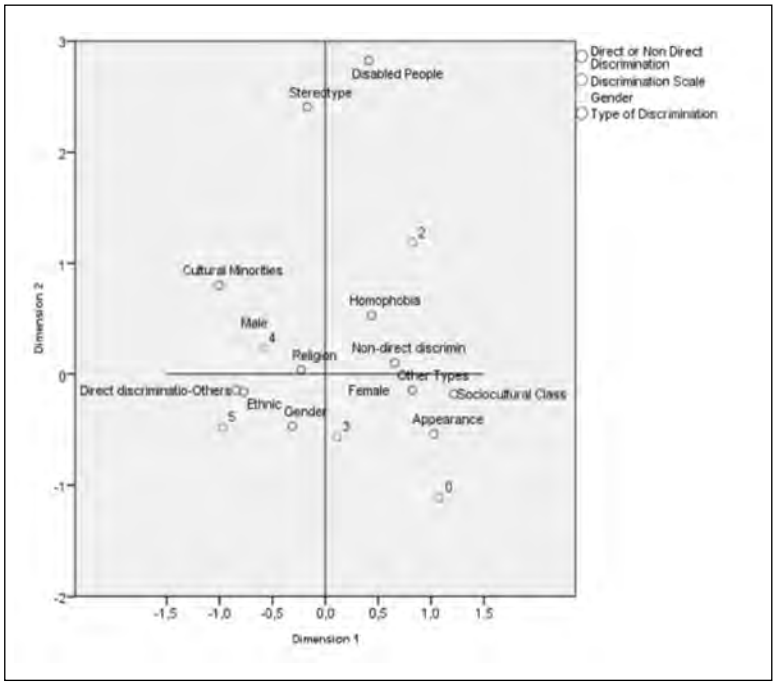

Figure 1. Multiple Correspondence Analysis results.

creates a coordinate axes display in which the information is grouped according to the closeness of the answers.

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Table 7. Multiple correspondence analysis **results**

	Dimension 1	Dimension 2	Total
Intertia	2.105	1.329	3.434
Eigenvalue	0.526	0.382	0.858
Correlations			
Type of discrimination	0.508	0.659	
Gender	0.513	0.082	
Scale of discrimination	0.533	0.573	
Direct or non-direct discrimination	0.551	0.014	

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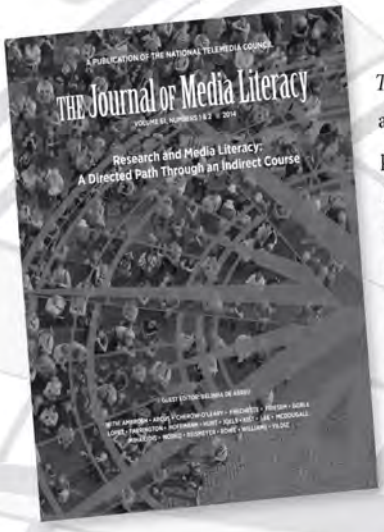

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An Analysis of the Interaction Design of the Best Educational Apps for Children Aged Zero to Eight

Análisis del diseño interactivo de las mejores apps educativas para niños de cero a ocho años

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ABSTRACT

The proliferation of mobile devices and their use by children of all ages raises issues among families and educators with regard to their quality and appropriateness. Given the absence of an industry standard or an official ratings system for children's apps, specialist websites or blogs are frequently consulted when choosing apps. This article presents the results of a content analysis of the visual and interaction design features of 100 educational applications recommended by international experts for children from six months to eight years old. In addition, the adaptability of an application's content to children was taken into account as a qualitative measurement. Four researchers participated in the definition of variables and the design of the observation instrument. This study focuses on child-computer interaction (HCI-CCI) from a pedagogical and developmental perspective, with the aim of discovering and promoting quality in mobile applications for children. The intention is to provide information on key criteria related to the design of applications for entertainment and learning. The results of the statistical analysis indicate a generally low-quality visual and interaction design in the sample group and content that mirrors problems in the school curriculum. Even applications with both content and design that are specifically targeted at children reveal issues that may impede user comprehension and interaction.

RESUMEN

La proliferación de dispositivos móviles y su uso por parte de niños de todas las edades crea dudas acerca de su calidad y adecuación entre familias y educadores. Ante la falta de un sistema acordado u oficial de clasificación de aplicaciones infantiles, se suelen consultar webs especializadas o blogs de expertos para escoger las apps. Este artículo presenta los resultados de un análisis de contenido de las características del diseño visual e interactivo de 100 aplicaciones educativas recomendadas por expertos internacionales dirigidas a niños entre seis meses y ocho años. Se analiza además la adaptabilidad al target infantil, a partir de una ficha de análisis diseñada por cuatro investigadores. Con la finalidad de buscar y promover la calidad en las aplicaciones móviles para niños, esta investigación se enmarca en los estudios de la interacción niño-ordenador (HCI-CCI) desde una perspectiva pedagógica y de la psicología del desarrollo. Quiere ser una aportación sobre los criterios clave en el diseño de aplicaciones infantiles para el entretenimiento y el aprendizaje. Los resultados del análisis estadístico indican una escasa calidad del diseño visual e interactivo de la muestra y unos contenidos que reproducen los problemas del currículum escolar. Incluso algunas aplicaciones que se caracterizan por adaptar su contenido y diseño al target infantil, presentan también errores que pueden obstaculizar la comprensión y las interacciones del usuario.

KEYWORDS | PALABRAS CLAVE

Child computer interaction, mobile devices, interaction design, graphical user interface, adaptability, content analysis, apps, quality. Interacción niño-ordenador, dispositivos móviles, diseño interactivo, diseño, adaptabilidad, análisis de contenido, apps, calidad.

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1. Introduction

Mobile devices (smartphones and tablets) are tools for communication, gaming, creativity and learning for children as predicted by Papert (1993), and they have become part of our daily environment in a manner unlike any other previous technology (Granic & al., 2014; Read & Markopouolos, 2013; Gramigna & González-Faraco, 2009). The most recent report by the Reynolds Journalism Institute (RJI) on mobile media (Fidler, 2014) states that more than 50% of American households have tablets and three-quarters have smartphones; it also reveals that households with children have more mobile devices than those without children (70% have tablets and 88% have smartphones). This data concurs with the study «Kids and CE» from the NPD Group (2014) which showed that more than 70% of families with children owned smartphones and tablets, when in 2012 it was no more than 55%, and in the case of tablets the number had doubled in two years.

A report by Common Sense Media (2013) in the US estimates that 72% of children between two and eight years old assiduously use mobile devices, as well as 38% of children under two years old, thus demonstrating a growing tendency toward an increase in the use of mobile technology and touch screens in early childhood, to the detriment of other technologies such as television and computers.

In Europe, a study by Mascheroni and Kjartan (2014) involving more than 3,500 children under the age of 16 in eight countries reveals how, depending on the country and the age range, between 30% and 60% of children use tablets or laptops daily. Approximately 10% of children under ten years old use smartphones daily, often connected to the internet.

Outside the home, mobile devices are also replacing computers in schools, especially in the case of tablets. As these devices are increasingly adopted and integrated into educational settings the methodology and content of the applications for children are increasingly seen as lacking in terms of quality, and they do not meet age-appropriate pedagogical standards (Chiong & Shuler, 2010; Neumann, 2014; Rideout & Saphir, 2013). Content quality in interactive children's applications is directly related to whether they are appropriate to the target age and specifically to the child's development (Guernsey, 2013); thus content in games and educational applications should clearly align with the interests and abilities of potential users. In addition, Grané (2012) demonstrates that multimedia content is not separate from format, but that the interaction design of the applications for mobile devices determines the accessibility of content for users, especially for preschool-aged children. The quality of mobile applications targeted at early childhood thus depends on two conditions: taking into consideration the developmental stage of the child when formulating content and activities and employing an interaction design that is appropriate to the child's cognitive and psychomotor development. The formal characteristics of the audiovisual and multimedia message may promote or inhibit comprehension and interaction on the part of younger children (Crescenzi, 2010).

Considering the weight of these facts, the objective of this study is to provide a snapshot of the current state of mobile applications that concerned parents and educators can use in the selection of quality applications for children. The child-computer interaction will be addressed from an educational development perspective as set out in earlier research (Amy, Alisa, & Andrea, 2002) and continuing through to today (González & Navarro, 2015; Radesky, Schumacher, & Zuckerman 2015). The research will consider aspects of the applications including communication design, graphical user interface (GUI) and interaction design (HCI), in addition to examining the context and child development typical of CCI (Read & Bekker, 2011).

2. Material and methods

2.1. Sample

The investigation involved a content analysis of 100 apps targeted at children under 8 years old and which were considered to be educational according to educators and experts. Selection of the applications was intended to replicate the experience of the general public facing the problem of choosing educational applications for their children or students. For this reason, the sample was picked by means of a sampling technique that included «the best educational apps» according to educators and experts in seven highly regarded international websites and blogs[1]. The selection of the «best apps» for younger children offered on these sites are currently the primary source of information available for parents and educators and are used as a basis for choosing an app.

The websites were selected based on quality and the system employed for evaluating the apps began with an initial web search performed in January 2014 using keywords in English and Spanish, for example «young children», «kids», «babies», etc. The most popular websites were further filtered so that only independent sources were included, and media groups or any organization associated with developing apps were excluded.

2.2. Observation instrument

The observation instrument2 included variables specifically related to communication and interaction design in each application as well as the content and learning activities present, thus generating a new focus that combines educational ideas, CCI, developmental psychology, and pedagogy. The guiding questions of the investigation were: Do apps for children under 8 follow basic principles of interaction design? Do they take into account the user's profile, adapting to his or her specific needs?

In November 2013 the first version of the instrument was created based on Grané's model (2012), including interaction design principles studied by Tognazzini (2003), Norman (2003), and Shneiderman and Plaisan (2010). In particular, the aspects of the design put forward by Grané were adapted with reference to children under [2]. The development of the observation instrument and codebook followed an inductive, as well as deductive, process. Utilizing the first version of the instrument, two researchers, who are experts in interaction design and education, independently carried out an analysis of a random sample of five educational children's apps. Next, they compared and discussed the results with two other experts in developmental psychology and pedagogy in order to decide on the elimination or inclusion of additional variables and to refine the definitions in the codebook. This process (independent observation of a reduced sample of apps followed by discussion) was performed five times, until agreement on the defining of variables was reached. Lastly, a pilot study with a researcher unaffiliated with the study was carried out and the results did not lead to any changes in the instrument.

In the final version of the instrument[3] the following design parameters were included:

• Visual design: including the organization and distribution of the screen elements, visual attention and user perception, as well as visual simplicity that is necessary with regard to young users.

• Adaptability: design elements including accessibility and attention to group or individual needs, legibility, clarity, and visibility of textual content.

• Interaction design: including usability and simplicity of interaction (CCI), sound, music, verbal communication and sound effects.

• Organization and navigation: organizational design, navigation and screen consistency.

Additionally, some aspects of content related to mental models, cultural referents, and existing knowledge of the target age group were evaluated. A group of variables were generated with reference to Gardner's theory of multiple intelligences (2006), activities and processes based on Bloom's taxonomy (1973), and UNESCO standard classifications.

> This design analysis of 100 applications considered by educators and parents as potential educational resources illustrates clear issues related to visual and interaction design, adaptability, layout and navigation, making it evident that there is a lack of quality and adaptation in terms of child development. An example of this is textual messages that often accompany key information, instructions, and feedback in applications for preschoolers.

2.3. Method and procedure

One researcher carried out a content analysis by means of a structured observation of 100 sample applications during the early months of 2014. The observations were registered in a spreadsheet template and the data was processed with the statistical analysis program SPSS. Due to the study's objective, the data analysis was descriptive.

The reliability of the encoding was measured with the assistance of a second encoder that independently analyzed ten apps; this represented 10% of the material evaluated (Tabachnick & Fidell, 2007). Cohen's kappa coefficient was used and a high concordance, greater than .61, was found for all the variables, following the classification of Landis and Koch (1977). The high number of variables and measurements explains why only 78% of the variables achieved consistency superior to 0.81 (very high). Finally, the same researcher performed another analysis on a random

selection of five apps from the sample one month later; the results indicated a perfect concordance on the responses.

3. Results

3.1. Sample characteristics

The sample turned out to be heterogeneous; a revealing aspect for the exploratory nature of the research, reflecting a diverse image of the market in educational apps and a lack of agreement on the classification of «the best apps» for children. In particular, 100 educational apps were reviewed, all of which were developed between 2010 and 2013 by 55 software development firms from distinct countries, including Australia, Ireland, Canada, the USA (the origin of 11% of the apps, the highest representation), various European countries including Ukraine, as well as China, Japan, Russia, Singapore and South Korea. Seven apps from the firm «TocaBoca» were part of the sample, six from «MyFirstApp» and various others from «A&R», while 38% were from other design firms. With regard to language, English was the most common (96%), followed by Spanish (41%), German (39%), French (38%), and Portuguese (21%). Other languages made up a smaller percentage of the sample (Arabic, Japanese, Basque, and others). Nearly all of the sample was compatible with the iOS operating system (91%) and 25% were designed for use with Android; Kindle was supported on 11% of the apps, 7% on Windows, and 2% on Chrome.

A significant observation noted in the review of the apps concerned the recommended age for each application. In more than a third of the sample (39%), the developers did not provide any guidance on age-appropriateness for their product. An additional 8% classified their applications as being «for all ages» (without regard for the unique characteristics of each age and the differences between a 2 year old and an 8 year old, for example). More than 3% of the applications reviewed were considered appropriate for children under 1 year old, and 6% for children over 1 year old even though there is still no consensus on whether audiovisual and interactive content should be recommended before 18 months, while children are still developing in terms of perception and attention.

With young users in mind, the study also took into account whether the apps contained parental controls so that children could not link to external sites or make purchases within the app (present in 50% of the sample). Only 16% of the sample was free of both advertisements and links to external websites, although 87% of the apps could be used without an internet connection, which made it possible to eliminate that type of interference. Two-thirds of the sample (66%) included information for parents and educators as well.

Little more than half (54%) of the apps evaluated were free or offered a free version (with limited features or a trial version). Nevertheless, 84% of the applications reviewed were for purchase or had an optimized version for sale, costing less than 3 euros in 74% of the cases, or between 3 and 10 euros (10%).

3.2. Results of the interaction design analysis

3.2.1. Visual design (GUI)

Equilibrium in the screen layout is the strongest visual reference in human perception (Dondis, 1973). However in 14% of the sample the gaming screens were not symmetrical, causing ambiguity in the user's visual perception which directly interfered with communication between the child and the device. This is especially true as problems were detected related to both placement and organization of screen elements that did not allow for an optimal visual design overall.

Although the majority of the apps studied emphasized or highlighted the active elements of the game, 22% did not do so effectively. The applications' design should take into account that highlighting can serve as an efficient aid for perception in the youngest users, as it draws their attention to the element and is particularly helpful when using an application for the first time.

Similarly, with respect to contrast between visual components and the background, visual perception of the content is key (Parrish & al., 2004) and some of the apps did not feature contrast between background and foreground (4%) or it was not effective (10%).

The firms designing the children's apps did show an interest in maintaining visual simplicity and 60% of the applications were as simple as possible. They did not contain any elements or actions beyond those necessary to play the game, which is an important aspect of interaction design where «eliminating unnecessary elements and reducing necessary ones as much as possible» is key (Butler, Holden, & Lidwell 2005: 182). This is in marked contrast with the fact that in 78% of the apps the objective of the game is not clear, either because it is not intuitive or it is not clearly indicated. This raises an even larger issue in light of the fact that they are indicated for pre-readers.

With reference to this problem, system interference during the game was studied (when two or more processes are in conflict and design errors can cause interference in communication). The presence of design elements that interfere with interaction and

other extrinsic interference were analyzed (for example: advertisements or links), and were found in 50% of the apps. As seen in figure 1, unnecessary text that may complicate interaction with the device was present in 36% of the apps. The presence of advertisements or other messages were seen in a third of the apps, and only 4% included the option to eliminate the ads. In addition, some apps (9%) included links to websites that force the user to leave the application (for updates, purchases, or advertisements).

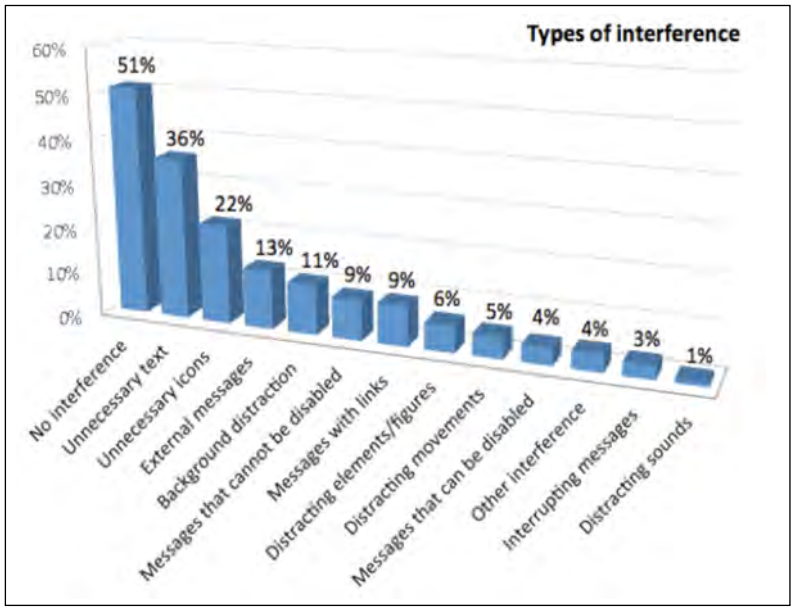

Figure 1. Types of interference present in the sample.

The help feature was also evaluated, both in terms of whether it was required as well as its layout and use. The feature can be counterproductive, as it was not required to play the game in 24 of the applications. Furthermore, the format was not always consistent with the age of the intended user, requiring reading skills in 32% of the apps.

Text is an important element and in many cases (23%) it was necessary to play the game and carry out the required actions. This correlates with a previous study by Rockman (2010) where the repeated use of written language was found to be a basis for interaction (CCI). In 96% of the apps text was present on the start screen (including in applications for children under four years old) and in the game screens of 63% of the apps, especially as information (53%), feedback (26%), and instructions (23%). In 39 cases the textual content was not present alongside an audible message and reading was the only way to access the information.

In relation to audible messages, 58% of apps included them as part of the game screen to give feedback (33%), information (20%), or instructions (16%), and in 13% of the cases they were required throughout the game in order to play.

Feedback on success or failure was present in 57% of the apps as a form of interaction. The use of feedback in interactive educational materials is a strategy defined by Kemp and Smellie (1989), but just as important as its presence is its adaptability. There was textual feedback in 23 applications, although it was only present as verbal feedback as well in five cases. A screenshot of an application that was very highly-reviewed by experts and recommended for children under 3 years old is seen in figure 2. It provides textual feedback but lacks audible reinforcement, resulting in confusion on the part of the child.

Feedback was also present in other formats: 13% of the sample included musical responses, 50% employed sounds and another 50% visual cues. The majority of the responses have an emotional connotation, which was positive in 35% of the cases and both positive and negative in 11%.

3.2.2. Adaptability

Along the same lines, the data indicates that users between 0 and 8 years old are considered a homogeneous group, while their development and abilities actually change radically during those early years. Only 22% of the educational apps studied contain different play options depending on the age or previous knowledge of the user.

Certain physical characteristics of mobile devices turn out to be especially useful for preschool-aged users: automatic screen rotation, multi-touch options and the ability to interface with the device using alternative gestures (for example moving an object either by touching a point on the screen or by dragging it). Nevertheless, only 9% of the apps permitted alternate gestures for a given action and only one of the 100 apps made it possible for the orientation to change between horizontal and vertical automatically, following the natural movement in very young children.

Figure 2. Textual feedback without audible reinforcement in «Numberland» (Les Trois Elles-Edoki).

Additionally, a review was made of gestures that are particularly complex for children under the age of 3, as seen in previous studies (Crescenzi, Jewitt, and Price, 2014). Examples include items such as a click and hold (extended touch) or scrolling. Very young children tend to touch the screen repeatedly instead of dragging, a gesture that was required to play in 62% of the sample apps, as seen in figure 3.

Although mobile devices are valued for their potential use in groups, the apps studied did not contain options for individual versus group use. The sample did include multi-touch capabilities in 29 cases (17 included simultaneous interaction of more than two fingers), however only two apps were designed for two or more players. Another 10 applications did not include multi-touch but they were intended to be used for group play.

With regard to accessibility, one result that stands out is the almost complete absence of options for the adaptation of visual (93%) and sound (91%) elements in the apps studied. A striking example is that only one out of 100 of the apps reviewed allowed for the adaptation of the keyboard according to the visual and physical abilities of children.

Characters or elements in the applications tended to be familiar to the target user (in 88% of cases). Humanized objects or animals (28%) were frequently seen, as well as children (26%) and adults (10%). Of these characters, 41% expressed some type of emotion (23% were negative emotions), a small amount considering that emotions can aid in comprehension and support the child's interaction with the device.

Finally, the majority of the applications employed icons or buttons with a symbolic meaning (84%) to play the game, which takes for granted a previous knowledge of multimedia language that is not consistent with the age of the target audience (for example a magnifying glass, a speaker, a planet, or gears).

3.2.3. Interaction design

The number of elements present simultaneously on the screen was greater than the minimum number for an app appropriate for use by a preschooler. Only 8% of the apps had less than three visible elements on the home screen and 47% had three or four active elements, a configuration that is acceptable for users between three and eight years old. However, more than half of the sample contained more than four and up to 39 active elements on the home screen.

An even more complex environment was often present on the screen while playing the game. Figure 4 shows an application focusing on visual perception, observation and memory for children between three and five years old (according to the game developer) that has more than 18 active elements on every screen.

The results indicate that active elements were limited to only one or two items in only 15% of the apps studied and another 23% contained between three and four active elements on the screen, but that

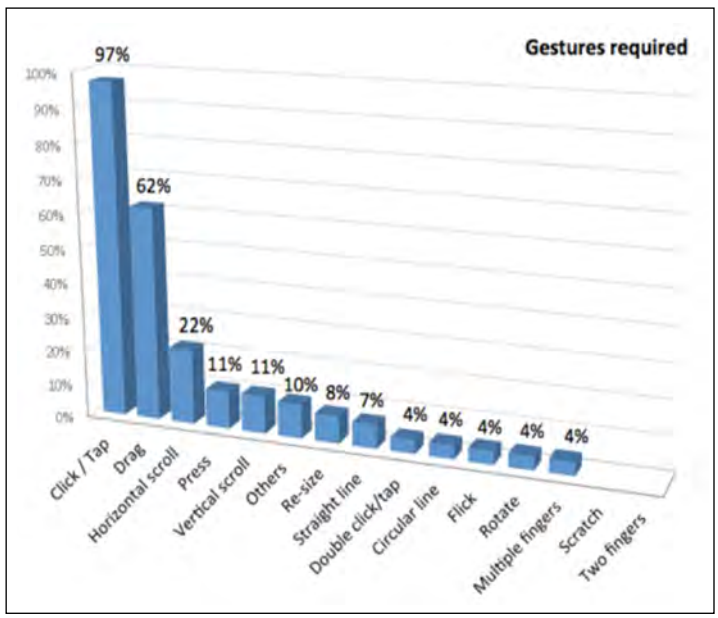

Figure 3. Gestures required in the sample apps.

62% of the sample could have between 5 and 56 different elements, thus complicating the child's interaction with the application.

These questions are key for simplicity, which is necessary for assuring quality in the usability of apps. This is a principle of interaction design that supersedes visual objects and is evidenced in the interactions between the child and the device. For the user, everything that is not a direct signal is noise, complicating communication with and the use of the application, a principle which is all the more important when the target audience is a child.

The role of music and sound is essential in a review of applications for children. The data show that 36% of the apps did not include any type of music and 7% of the sample did not contain music or sounds. Music was activated after touching an active element on the screen in only 14% of the cases, a feature utilized more for sounds (80%). Music was a response to the user's actions in 16% of the apps, while the response was a sound effect in 70%. In addition, music reaffirmed the visual information in 22% of the cases while sounds were used for this in 94%. This strategy facilitated comprehension of the content on the part of children.

3.2.4. Layout and navigation

The actions required for navigation were not the minimum necessary in 14 of the applications (navigational options that were not necessary to play the game were present). In some apps (18%), children tended to touch the screen between three and five times before beginning to play. Children under three years old should not have to touch the screen more than once in order to access the game (50% of the sample conformed to this standard) and those under six no more than two times (this was the case for 32% of the apps studied). Another, related result involved the number of screens that had to be navigated through before starting the game. In 54% of the sample it was only one screen, in 31% it was two screens, and in 15% of the apps the preschooler had to go through between three and seven screens before beginning the game.

With regard to layout, 59% of the apps permitted free navigation according to the user's preferences, while in a minority (16%) of cases the action took place in only one screen, and in the same percentage there were gradual systems where the level of difficulty determined the advancement of the user. Lineal (more like e-books) or hierarchical systems were used in 12% of the apps. Finally, it was observed that 39% of the applications did not allow the user to repeat an activity without leaving the game, even though repetition is a learning strategy that is captivating for very young children.

Figure 4. Crazy Fun Lab by Playtoddlers.

3.3 Results of the content analysis

The content of the sample set places nearly all of the apps (96%) in the area of cognition (information processing, prior knowledge, and mental abilities), 70% in psychomotor development (manipulative and motor) and only 22% in the area of affective-emotional development (attitudes and feelings).

With regard to multiple intelligences (Gardner, 2006) this was not demonstrated homogeneously. In particular, eight out of ten apps operated in the sphere of spatial and logical/mathematical intelligence, while linguistic intelligence was seen in 41% of the sample. Psychomotor and interpersonal competencies were present in 23% and 21% respectively, although they are developmentally essential for children under eight years old. One result that stood out was that very few apps attempted to focus on intrapersonal (10%) or musical (6%) intelligence.

Learning activities present in the games reflected the educational objectives of the children's apps. As seen in figure 5, in 94 of the 100 apps studied the objective was to recognize content, explore it (64%), or memorize it (44%). In general the applications focused on conceptual content. Actions associated with mathematical processing were also frequently present, even in apps that did not have mathematical learning listed as an explicit objective, thus logical operations and ordering were seen repeatedly in the majority of applications. However, actions and objectives related to creativity and the construction of knowledge were a minority with less than 30% of the apps oriented at imagination or the formulation of hypotheses, 13% at

audiovisual creativity, less than 10% at writing, and only 3% at creating music.

Figure 5, «Learning activities» can be found on Figshare (http://goo.gl/osYJkn).

Finally, and contrary to the researchers' expectations, gender stereotyping was seen (in 20% of the sample) as well as racial stereotyping (8%). In addition, using a contingency table it was found that racial and gender stereotyping occurred in the same application 5 times.

4. Discussion and conclusions

Despite the fact that the market is saturated with applications for children, the label «educational» or «for children» does not indicate that an app has been validated and tested (Guernsey, 2013). In this context, the purpose of this research is to contribute to ensuring quality design and content in children's apps and their adaptation to different developmental stages in children.

This design analysis of 100 applications considered by educators and parents as potential educational resources illustrates clear issues related to visual and interaction design, adaptability, layout and navigation, making it evident that there is a lack of quality and adaptation in terms of child development. An example of this is textual messages that often accompany key information, instructions, and feedback in applications for preschoolers.

The interaction design presents key difficulties in the search for simplicity due to the elevated presence of distractors and active elements on the screen that are often unnecessary.

In addition, the content of the apps studied indicates a hegemony of curricular content (common in all Western countries) to the detriment of the other learning areas including socio-affective, artistic, and creative, as well as the construction of knowledge. The presence of stereotypes was another conspicuous element.

Although research in the areas of education, psychology, and CCI clearly demonstrate the potential of quality interactive resources for learning, the apps reviewed did not adapt to the needs of the target group. As such, a need can be seen for the transfer of the results to the video-gaming industry. In future research it will be necessary to complement the results of the heuristic analysis with observations of the interaction of children with the apps, define the direct implications of those results in terms of educational practice, and establish a relationship with developers to improve interactive materials and their adaptability, all of which will result in an improvement in the definition of quality in educational apps for children.

Notes

[1] International websites that review children's apps that were used in the selection of the sample: Smatoos (http://goo.gl/Z9UL78), A Matter of App (http://goo.gl/DxPpwz), Mind Shift: (http://goo.gl/o7-Fu6o), Children's technology review (http://goo.gl/zRmGSy), Common Sense Media: http://goo.gl/paAc9t), Technology in (SPL) education (http://goo.gl/5NOQKM), Best apps for kids (http://-goo.gl/EeFDis).

[2] The observation instrument can be seen at www.lmi.ub.edu/-apps4kids/analisis.html.

[3] The results presented in this article are part of a study that included the participation of other authors, including: Carol Ibáñez and Marta López (UB).

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The Ubiquitous Possibilities of the Laptop: Spanish University Students' Perceptions

Posibilidades ubicuas del ordenador portátil: percepción de estudiantes universitarios españoles

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ABSTRACT
University classrooms have been taken over by a new type of student, the «plurimodalicts». This society is characterized by the different ways its students relate to ICTs. This article analyses where, how and for what a sample of 451 students from five Spanish public universities use their laptop computers. The study uses an incidental non-random cluster sample design. Data collection was conducted via questionnaire based on a five-point Likert scale. The questionnaire was divided into three sections: computer use; location and frequency of use of the device; and laptop functions and applications. The study concludes that «plurimodalicts» use their laptops to produce academic work, as well as for exchanging class notes and searching for information. The distance or direct learning methodology and the respondent's gender also determine laptop use for academic tasks, which is greater at distance learning institutions and is more prevalent among women than men. These devices are mainly used at home and, in the case of the younger respondents, also in university libraries. The laptop functions vary according to age group, and the device is mostly used for gaming and as a study tool by the youngest students.

RESUMEN
Las aulas universitarias están ocupadas por un nuevo modelo de sociedad estudiantil denominada «plurimodaltic». Esta sociedad se caracteriza por el conjunto de relaciones que establecen los universitarios con las tecnologías de la información y comunicación (TIC). Este artículo analiza los usos, lugares de utilización y funciones que otorgan 451 estudiantes de cinco universidades públicas españolas al ordenador portátil. El muestreo utilizado para el estudio parte de un diseño muestral incidental no aleatorio y por conglomerados. La recogida de información se ha realizado a través de un cuestionario con respuestas en escala Likert de cinco puntos. Éste se ha estructurado en tres secciones, una para usos del ordenador, otra para lugares y frecuencia de uso del dispositivo y la última para funciones y aplicaciones del ordenador portátil. Las conclusiones obtenidas permiten afirmar que el uso mayoritario del ordenador portátil entre la «plurimodaltic» es académico. Se usa para elaborar trabajos, intercambiar apuntes o buscar información. La metodología de la universidad de procedencia y el género del entrevistado determina el uso académico de los ordenadores portátiles siendo mayor en las universidades no presenciales y entre las mujeres que entre los hombres. El lugar donde mayoritariamente se utilizan estos dispositivos es en los domicilios particulares seguido, entre los entrevistados más jóvenes, por las bibliotecas universitarias. Las funciones otorgadas al ordenador portátil varían con la edad siendo mayoritariamente lúdica e instrumental entre los más jóvenes.

KEYWORDS | PALABRAS CLAVE
University students, laptop, learning styles, ubiquitous, digital divide, media skill, digital literacy, prosumers.
Estudiantes universitarios, portátil, estilos de aprendizaje, ubicuo, brecha digital, competencia mediática, alfabetización digital, prosumidores.

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1. Introduction

Universities still have pseudo-analogical students who use ICTs in a way that follows the logic, structure and usage of educational resources that existed prior to content digitization. They continue to work according to forms of teaching and learning that accompanied the arrival of Web 1.0, a static network providing one-way transmission of information and knowledge (Santos, Etxeberría, Lorenzo, & Prats, 2012). These students can create their own study models (Tabuenca, Verpoorten, Ternier, Westera, & Specht, 2013) and professional development models (Tabuenca, Verpoorten, Ternier, Westera, & Specht, 2012) in a way that is unaffected by the influence of media.

Pseudo-analogical students, in the main, have been unwilling, unable or simply have not known how to become multimodal literate (González, 2013; Bautista, 2007), multimedia literate (Esteve, Esteve, & Gisbert, 2012), digital literate (Gisbert, 2013; Area, Gutiérrez, & Vidal, 2012; Travieso & Planella, 2008) or media literate (García-Ruiz, Ramírez-García & Rodríguez-Rosell, 2014; Area, 2012; Aguaded, 2012), acquiring skills that would enable them to take an active part in the knowledge society as prosumers (Aguaded & Sánchez, 2013; Villalustre, 2013; Khan, 2012) instead of remaining mere consumers.

Pseudo-analogical students are also joined in the lecture hall by digital immigrants (Wang, Myers, & Sundaram, 2013; Prensky, 2011; Prensky, 2001) and Net visitors (Tabuenca, Ternier, & Specht, 2013). These two groups are passive or non-participatory users of media. Their voluntary telematic inactivity classes them as neither in danger of digital exclusion nor pushes them to the edge of any digital divide (Marciales, 2012; Monclús & Sabán, 2012). They are in fact veteran learners.

Other groups in the lecture hall include the new learners (Gurung & Rutledge, 2014; Thompson, 2013), the new millennium learners (Trinder, Guiller, Margaryan, Littlejohn & Nicol, 2008), the «Instant message generation» (Bautista, Escofet, Forés, López, & Marimon, 2013; Gisbert & Esteve, 2011) the «Net Generation» (Jones, Ramanau, Cross, & Healing, 2010; Tapscott, 1999), digital natives (Wang, Myers, & Sundaram, 2013; Fueyo, 2011; Prensky, 2011), digital literates (González, 2012), technological literates (Ortega, 2009), the student residents (Hernández, Ramírez-Martinell, & Cassany, 2014) prosumers (García-Ruiz, Ramírez-García & Rodríguez-Rosell, 2014) and media prosumers (Ferrés, Aguaded, & García-Matilla, 2012), among others.

This student universe consisting of so many different technological profiles is the base of our investigation. The statistical study of the data collected revealed that the students' relation to ICTs was plural in nature, so, in our modest attempt to contribute to the knowledge on this subject, we have defined this relationship as «plurimodalict», based on the words plural, modalities and ICTs.

We apply the term «plurimodalict» to all university students who are media citizens, media literates (Sánchez & Aguaded, 2013; Aguaded & Sánchez, 2013; Aguaded, 2012), media humanists (Pérez & Varis, 2012), audiovisual literates and all other possible types of media user previously mentioned here, and who will later appear in the scientific literature.

The main feature of the «plurimodalict» society is the various ways in which university students use media for learning and communication, separately or synchronically. It is by its nature a multifactor polyhedron society reflecting students' unpredictable stance towards technology, in that it is by no means certain that students use digital tools in their teaching-learning processes although they might use particular technologies in their daily lives. This confusion arises because they do not always want to use the technological tools they manage in their daily lives as learning tools (García, Gros, & Escofet, 2012).

Such behaviour has made this research difficult, for example, when attempting to determine what type of mobile device they normally use. This volatility is influenced by the data package for each device, the student sample selected, the socioeconomic and academic status of the student, place of residence and the academic subject studied.

To find out which mobile digital device is most used by the «plurimodalicts» we consulted official statistics, which offered results that were generic. An extrapolation of figures from the 2014 edition of the annual report from 2013 by the Ministry of Energy and Industry (Urueña, 2014) reveals that the electronic device with Internet access most used by the «plurimodalicts» for academic work is the laptop computer.

2. The laptop computer

Since 2012, it has been the mobile phone that has competed for our attention as the most frequently used device among ICT users (Mihailidis, 2014; Tabuenca, Ternier, & Specht, 2013; Yang, Lu, Gupta, Cao, & Zhang, 2012). These devices can be either smartphones or non-smartphones. Hence researchers need to clarify whether a smartphone is an electronic device

for oral communication between two speakers that can also execute apps and connect to the Internet (Ruiz-Olmo & Belmonte-Jiménez, 2014) or whether it is a portable computer that can be used as a phone.

By the third quarter of 2013 in Spain, the smartphone had become the most frequently used device among ICT users, although its main specific use remained undefined. That being so, this research team concluded that the laptop computer rather than the smartphone was the device used most by students when doing academic tasks. This is justified by the fact that 87.1% of the population have Internet access at home, and 62.5% of homes have a laptop, while only 53.7%, or half the population have smartphones.

Internet is accessed at home via smartphone by 74.3% of the population, by laptop in 68.4% of cases and by the desktop PC at 66.6% (Urueña, 2014).

The smartphone is for single person use while the laptop and desktop computers can have many users. This multiplicity of users of computers and the greater ergonomic comfort of using a laptop as opposed to a smartphone, with their bigger screens and better resolution, mean that laptops are still the most widely used mobile electronic device. Their only drawback compared to the other digital mobile devices is the quality of the software they support.

Assuming the numerical superiority of the laptop over the smartphone, this article will characterize the uses, functions and the places where laptops are used in Spain by the «plurimodalicts».

3. Methodology

This article addresses the subject of laptop usage in a sample of 451 students from five public universities in Spain: Complutense, Vigo, Oviedo, Granada and the UNED. The research took place at public universities as the study was financed with state funds. The objectives were: to identify the uses of the laptop by «plurimodalicts»; to identify the actions that «plurimodalicts» perform on these devices and to show where these activities take place. To achieve these objectives, we used an incidental non-random cluster sample design. The choice of clusters as a representative sample of the universal population was random, but not the final units. This does not mean the sample is less representative, and it enables us to draw general conclusions from the reference results but not an estimate of the errors on the population parameters. Data were gathered by questionnaire, with a five-point Likert scale to measure responses. The questionnaire was structured in three parts, with laptop use corresponding to 10 items, location and frequency of use 9 items and functions and applications 9 items.

The internal consistency of each scale was measured using the Cronbach Alpha Coefficient. The results for the reliability of each scale were: Cronbach Alpha for the dimension of laptop uses, 0.73; for location and frequency of use, 0.72; for functions and applications, 0.77; the Cronbach Alpha for the instrument overall was 0.81. The scores show the consistency of the questionnaire. The reliability measure for each scale is shown in section 4 of this article.

The sample consisted of 23.7% men and 76.3% women, and the proportions were similar in the five universities studied. The gender imbalance is due to the fact that the respondents studied subjects that are more popular among women than men. In terms of age range, 24.4% were between 18 and 20, 33% between 21 and 23, 10% between 24 and 27, 5.7% between 28 and 31 and 26.9% over 31. The age range corresponds to the level of education on which the participants are studying, with 24.2% studying for a bachelor's degree, 70.5% as undergraduates, 0.3% for a doctorate, 4.7% for a Master and 0.3% had already graduated. In terms of which university, 5% were from the Complutense University of Madrid, 40% from Oviedo, 10.9% attended the University of Vigo, 18.2% from Granada and 25.8% studied distance learning courses at the UNED.

> Universities still have pseudo-analogical students who use ICTs in a way that follows the logic, structure and usage of educational resources that existed prior to content digitization. They continue to work according to forms of teaching and learning that accompanied the arrival of Web 1.0, a static network providing one-way transmission of information and knowledge.

4. Results and discussion

4.1. Scale: The uses of the laptop

Table 1 shows the results from each item on the first scale. Laptop use among those sampled consists mainly of information search (76.5%), for collaborative tasks (70.1%) and learning (70%). The device was used least for tasks involving innovation (41%) and expression (47.2%). The results vary according to gender, age and university.

Table 1. Frequency of use of laptop computers

Laptop computer uses	Respondent percentages	
	Yes (%)	No (%)
Entertainment	65.4	34.6
Expression	47.2	52.8
Motivation	47.8	52.2
Information	76.5	23.5
Learning	70	30
Collaboration	70.1	29.9
Communication	63.5	36.5
Illustration	53.4	46.6
Innovation	41	59

In terms of gender, women use their laptops to search for information in 78.9% of cases, and men 69.8%. For age range, 97.2% of those between 18 and 20 consider info searches to be the most important use to which they put their laptops while only 28.9% of those over 31 do so. In terms of university, the figures are Complutense (94.4%), Oviedo (89.2%), Vigo (95.6%) and Granada (93.5%), where classes are face-to-face, as opposed to distance learning at the UNED where the figure is 1.4%.

The second most widely applied use of the laptop by students is in collaboration tasks, 70.1%. By gender there is no significant difference: 68.6% for women and 75.5% for men (C=0.063, Sig.=0.202). Neither is there a significant difference for age. Students aged 18 to 20 valued this use at 62.3%, those between 24 and 27 at 78.6% and those 31 and over at 71.9% (C=0.113, Sig.=0.266). In terms of university, the differences are significant: (C=0.258, Sig.=0.000) with scores of 60.2% for Oviedo, 77.8% for Vigo and 90.1% for UNED students.

Using the laptop for learning (70%) reveals no significant statistical differences (C=0.037, Sig.=0.454). This usage type would appear to be more important for women (71.4%) than for men (67.4%). Younger students (18-31) appreciate this usage more (88.9% and 70.1%) than their older colleagues (45.6%). The same occurs at those universities where students attend class: Complutense (65.7%), Oviedo (77.6%), Vigo (82.2%) and Granada (79.2%) compared to UNED (44.4%).

The explanatory factor analysis gives a KMO test score of 0.80 and 771 for the Bartlett sphericity test. There is a significance level of 0.000, which indicates that the dimension reduction model is adequate.

The explained variation of the first three factors with self-values higher than 1 is 62%, meaning that the three-dimensional model can be used satisfactorily. Factor saturations of the variables show that the first factor influences entertainment. They saturate entertainment (0.755), information (0.794) and communication (0.641), while the second factor influences motivation: motivation (0.739), innovation (0.772). The third influences learning; saturation of learning (0.796), collaboration (0.611) and illustration (0.575).

Using the saturation coefficients, we calculated the factor scores for the sample subjects in order to obtain the variance analyses and define differences within the gender, age and university variables. The results indicate that the first factor (use of laptop for entertainment) is more important for the youngest respondents (18-20 year olds) (F=51.45, Sig.=0.000) than for the older learners (31 and over) and the distance learners (UNED) (F=146.5, Sig.=0.000). The second factor (motivation) varies according to the university where the participants study (F=3.83, Sig.=0.005). The students with the highest scores are those from the UNED, with Oviedo scoring lowest. The use of the laptop for academic work shows significant differences for age (F=7.02, Sig.=0.000). This is valued less highly by those older than 31. The universities that score highest and lowest in this category are Complutense and UNED, respectively.

4.2. Scale: The activities performed

The data indicate that laptop use for academic tasks (producing work, study, exchanging class notes, searching for academic information) is very frequent or frequent, ranging from 88.7% (producing work) to 55.2% (exchanging class notes), which allows us to state that although learning patterns generated by Web 1.0 and 2.0 are hardly dynamic (Francisco, 2011), the Spanish «plurimodalict» uses the laptop mainly for learning.

The results for gender reveal that 92.5% of women use the laptop for producing academic work as opposed to 77% of men. In terms of age, the statistics are not significantly different (C=0.194, Sig.= 0.422); the 18-20 age group use the device more (92.5%) than those 31 and over (85.3%). The scores by university are also high, with 100% of «plurimoda-

licts» in Granada and 84.9% in Oviedo using the laptop for academic tasks. The data show that the laptop is often used for other reasons that are not directly academic but which can perhaps be considered educational, such as e-mail communication (87.7%), social networking (71.6%) and entertainment (62.1%). However, the use of laptops for online chats is low (36.9%), possibly because students prefer to use their smartphones for chatting (Quicios, Sevillano, & Ortega, 2013).

Table 2: Frequency of use of laptop computer for each activity

Activities performed with laptop	Response percentages				
	N (%)	HE (%)	OC (%)	OF (%)	A (%)
Producing academic work	1.2	1.7	1.5	20.1	68.6
Study	6.2	9.1	25.2	29.5	30
Search for non-academic information	1.2	5.5	15.1	38.8	39.5
Chats	22.4	20.6	20.1	18.6	18.3
Social networks	8.6	7.9	11.9	23.7	47.9
Exchanging class notes	6.4	11.2	27.1	30.8	24.4
E-mail	1.7	2.9	7.7	21.4	66.3
Search for academic information	1.9	3.4	9.5	32.6	52.6
Doing group tasks (Skype)	18.2	24.7	24.2	16.5	16.5
Entertainment	4.2	10	23.7	30.7	31.4

N = Never; HE = Hardly Ever; OC = Occasionally; OF = Often; A = Always

Analysing laptop usage for e-mailing, we observe that this activity is greater among women (90.5%) than men (79%), and is very frequent across all the age ranges. Students aged 28 to 31 use the laptop for e-mailing in 95.9% of cases, and those between 18 and 20 score 81.1%. In terms of the universities, the scores range from 93.3% at UNED and 80.5% for Complutense.

The third activity corresponding to laptop use for information purposes is the search for educational information (85.2%). Women use their laptops frequently to find information (89.5%), and men less so (70.2%). The 18-20 year-old students score 91.3% against 70.8% for those aged 24-27. In terms of the five universities, direct or distance learning influences laptop use for information sourcing, with 91.4% of UNED students citing this usage as opposed to 76.4% from Oviedo.

The exploratory factor analysis yielded a KMO score of 0.80, 626.36 for the Bartlett sphericity test and a significance level of 0.000. We then used a dimension reduction model to generate a model containing four factors that explain the 68% variance. The principal components method with Variamax rotation was used to extract those factors.

The saturations of the variables in each of the four factors extracted and rotated indicate that the first factor is related to the use of the laptop computer for carrying out academic activities. Saturations occur in the production of works (0.783), study (0.745), e-mailing (0.537) and searching for academic information (0.726). The second factor is related to facilitating the learning process via contact with colleagues. Saturations affect the exchange of class notes (0.595) and performing group tasks via Skype (0.877). The third factor relates to use of the laptop as a social communication tool. Saturations influence chats (0.861) and social networks (0.777). The fourth factor refers to the laptop as an entertainment tool, with saturations of the search for non-academic information (0.752) and entertainment (0.842).

An ANOVA test was run to check for significant differences between the scores for the subjects in each extracted and rotated factor, and the gender, age and university variables.

In use of the laptop for academic activities the variance analysis of factor scores show that women use the laptop for this task more than men (F=22.54, Sig.=0.000), a result which coincides with the findings of other researchers (García, Gros, & Escofet, 2012) and shows that our research consolidates and categorizes a methodology and a trend.

This article is also valuable as it reinforces the formulation of a new theory by conceptualizing a new type of student society, the «plurimodalict» society, characterized by the relation that students establish with ICTs. The study on which this article is based indicates that age is not a significant variable in the use of the laptop for performing academic activities. So, age is not important as a constituent characteristic of the «plurimodalict».

On the other hand, distance or direct learning as a teaching methodology influences the frequency of use of the laptop for academic activities (F=12, Sig.=0.000). Students in the classroom do not have the same technological necessities as distance learners. This hypothesis is validated by the data. Post-hoc comparisons reveal statistically significantly differences in the scores for this factor in students at the UNED and those from Oviedo and Granada.

4.3. Scale: Location of laptop use

Table 3 presents the response percentages for each item on the third scale.

Students hardly ever use their laptops at university, except in the library, and neither do they use them much outside or when commuting. The most usual places for laptop use are at home (70.1%) or at work (23.2%).

A factor analysis of the items on the scale together with the disaggregation of the scores for gender reveal that 93% of women mostly use their laptops at home, while men score 86%. Disaggregated scores for age show that those over 28 (95%) do the same as opposed to 86% of those under 28. For universities, 95% of UNED students use their laptops indoors against an 86% average for the «plurimodalicts» at the four other universities.

The scores for the KMO and Bartlett sphericity tests are 0.73 and 499, respectively, with a significance level of 0.000. A factor analysis of the items on the scale showed that the first four factors explain 70% of the total variance, making the variables on the scale sufficiently representative. The first factor is heavily loaded in relation to the use of the laptop at university; they saturate university cafeteria (0.698), corridors (0.871) and classrooms (0.621). The second factor indicates laptop use at work or in the library, saturating the former (0.815) and the latter (0.700). The third factor refers to laptop use outdoors or on transport, with saturation of leisure areas (0.623), outdoors (0.872) and transport (0.698). The fourth location for laptop use is at home (0.909).

The ANOVA tests for each factor show that the subjects aged 18 to 28 use their laptops at university (cafeteria, corridors, classrooms) more frequently than their elders ($F=7.41$, $Sig.=0.000$).

UNED and Granada students use theirs at home more than students from the three other universities ($F=3.66$, $Sig.=0.006$). Students at Complutense, Vigo and Oviedo use their laptops more at university ($F=15.56$, $Sig.=0.000$).

5. Conclusions

This article deals with a highly contemporary theme, as the extent of the national and international literature on the subject testifies. It is a fertile study area at the moment and our article offers a novel perspective. In the last five years, there has been a lot of research into computer and smartphone use by students but not so much on the content of that usage.

In line with other research on the subject, the results presented in this article scientifically strengthen a principal of global theory on the phenomenon studied (Ruiz-Olmo & Belmonte-Jiménez, 2014; Urueña, 2014; García, Gros, & Escofet, 2012). This article consolidates and categorizes a methodology and a trend, and also contributes to the formulation of a new theory, which is that university students constitute a new type of society that we call «plurimodalicts», a term we have coined from the words plural, modalities and ICTs.

The «plurimodalicts» are an emerging model of university student. This is formed of students who connect to the ever-changing polyhedron ICTs and use a communication device in a number of different ways depending on where they are at the time, the data package and type of relation they have with ICTs.

The verified global results indicate that this society uses the laptop mainly for academic work. In the sample, 88% stated that they use it for producing works, and 55% for exchanging class notes or searching for information. Other uses include communication via e-mail (88%) and social networking (71%). Factor analyses and ANOVA tests revealed that it is women who mainly use the laptop for academic activities.

Further variance analyses showed that the students aged 18 to 28 use their laptops in the university library more than their older counterparts (32%). The locations most widely frequented in terms of laptop use across all age ranges were the home (91%) followed by the workplace (43,8%). The results also show that other spaces such as gardens, transport and the outdoors in general are emerging as student study places thanks to the laptop's portability.

The variable corresponding to university mem-

Table 3. Frequency of laptop use in each location

Location of laptop use	Response percentages				
	N (%)	HE (%)	OC (%)	OF (%)	A (%)
University cafe	62.2	17.9	11.1	4.6	4.1
Corridors	67.4	14.4	11.3	5.2	1.7
Classrooms	45.6	15.9	18.9	12.4	7.3
Leisure areas	52.9	20.5	13.7	6.3	6.6
At home	2.7	1	5	21.1	70.1
At work	31.8	8.2	16.2	20.6	23.2
Outdoors	77.5	13.5	4.1	2.2	2.7
Library	30.1	14.5	23	17.9	14.5
Commuting	79.3	12.0	4.7	2.8	1.1

N = Never; HE = Hardly Ever; OC = Occasionally; OF = Often; A = Always

bership indirectly confirms the validity of our sample and the data collected. Distance learners at the UNED use their laptops at home more than students at the other four classroom-based universities.

Regarding laptop use for non-academic purposes, neither age, gender or university membership were significant in the factor analysis for laptop use for contact with colleagues or as a social communication or leisure tool, although the younger students tend to make more use of theirs for gaming than the older learners.

The factor analyses identified some dimensions related to laptop uses and functions which future works could define as specific user profiles of the «plurimodalict» phenomenon. This study shows that university teaching staff need to design didactic content and activities that fit the «plurimodalict» learning style and the different ways in which «plurimodalicts» use their laptops.

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Generation Z's Teachers and their Digital Skills

Los docentes de la Generación Z y sus competencias digitales

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ABSTRACT

The presence of technological resources in schools and the high performance of so-called «Technology Generation» or «Generation Z» students are not enough to develop students' digital competence. The primary key is determined by the technological and pedagogical skills of teachers. In this paper, we intend to analyze the level of ICT skills of teachers in primary and secondary establishing a competency framework adapted to the Spanish educational environment, using as a basis the standards established by UNESCO in 2008 and reformulated in the year 2011. For this purpose, a questionnaire was done to show the profile of ICT teacher training faculty of the sample (80 schools and 1,433 teachers in the Community of Madrid) to study the characteristics of better training for the development of teachers was conducted under the digital jurisdiction of the Ministry of Education of Spain. The study results show a significant difference between optimal ICT skills and the low skills that teachers really have to develop learning activities with technological tools for their students. Teachers' digital skills are very important in the development of learning processes to introduce technologies as tools in the service of education, and this study will allow us to make decisions in policy formation and throughout early career teachers.

RESUMEN

La mera presencia de recursos tecnológicos en los centros y las altas capacidades de los alumnos de la «Generación Tecnológica» o «Generación Z», no son suficientes para desarrollar en los alumnos la competencia digital. La clave fundamental viene determinada por las competencias tecnológicas y pedagógicas de los docentes. En este trabajo, se pretende analizar el nivel de competencias en TIC de los profesores de Primaria y Secundaria estableciendo un marco competencial de referencia adaptado al ámbito educativo español, utilizando como base los estándares establecidos por la UNESCO en el año 2008 y reformulados en el año 2011. Para ello, se realizó un cuestionario que permitió establecer el perfil de formación docente en TIC del profesorado de la muestra (80 colegios y 1.433 profesores de la Comunidad de Madrid), para estudiar las características del profesorado mejor formado para el desarrollo de la competencia digital que establece el Ministerio de Educación de España. Los resultados muestran una alarmante diferencia entre las competencias que debieran tener los profesores para desarrollar la competencia digital en sus alumnos y la que verdaderamente tienen. Las competencias digitales del profesorado son muy relevantes en el desarrollo de procedimientos de aprendizaje que introduzcan las tecnologías como herramientas al servicio de la educación y este estudio nos permitirá tomar decisiones en política de formación inicial y a lo largo de la carrera profesional del profesorado.

KEYWORDS | PALABRAS CLAVE

Digital competence, ICT standards, learning management, teacher, curriculum, training, professional career.
Competencia digital, estándares TIC, gestión del aprendizaje, profesorado, currículum, formación, carrera profesional.

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1. Introduction and state of the question

The concern throughout the education community (parents, teachers, students and society as a whole) triggered by the development and implementation in 2014 of the 2nd Education Act (Organic Law 8/2013), which establishes further measures to address core competencies, highlights the importance of reflecting on the learning processes and educational needs of the generations currently attending our schools. Such reflection must be based on a thorough understanding of what has come to be known as Generation Z. Other names have also been used to refer to this population group, such as Generation V (for virtual), Generation C (for community or content), the Silent Generation, the Internet Generation or even the Google Generation, but they all have a common denominator, information and communication technologies (ICTs).

Generation Z (Schroer, 2008) encompasses children or teenagers who were born between 1995 and 2012, as opposed to Generation Y (1977-94), also called the 2nd «Baby Boomer» Generation, and Generation X (1966-76), or the lost generation. Other authors (Mascó, 2012) have been even more specific, identifying the Z1 generation, born between late 1990 and 2000, and the Z2 generation, those born after 2005. A new generation has been proposed for those born after 2010, namely Generation α or «Google Kids» (Grail Research, 2011), defined to be the first generation of the 21st century, the most numerous to date, to be early adopters of technology, to start sooner and stay longer in school and to be focused on technology (figure 1).

However, in order to determine what the future of Generation α will be like, the Generation Z currently attending school presents a number of characteristics that authors such as Dolors Reig (Blog «El Caparazón»: http://goo.gl/VSEQ52) have attempted to study and which are summarised below (Geck, 2007; Hoffman, 2003; Posnick-Goodwin, 2010; Lay-Arellano, 2013; Aparici, 2010; Bennett, 2008): 1) Expert understanding of technology; 2) Multi-taskers; 3) Socially open through the use of technologies; 4) Fast and impatient; 5) Interactive; and 6) Resilient.

According to a Spanish Ministry of Education, Culture and Sport (MECD) report (2014), there are 8,081,972 students enrolled in general non-university education, from the 1st cycle of pre-school education to initial vocational qualification programmes. These belong to Generation Z, and are in our schools today.

The MECD (2013) has also published data on the number of teachers working in non-university education. From a total of 664,325 teachers, 10.8% are under 30 years old, 30% are between 30 and 39, 28.9% are between 40 and 49, 26.3% are between 50 to 59 and 4% are over 60 years old. Thus, about 40% belong to Generation Y (1977-1994), 30% to Generation X (1966-1976) and another 30% to the 1st generation of post War II World (1945-1965) «Baby Boomers». This generational divide between teachers and students, combined with the need to develop core competencies in compulsory education (especially digital competence), adapt to new social skills related to the use of technologies and address the new learning needs of a changing society, raise questions about the preparation of current teachers for leading the teaching-learning processes that Generation Z students will use.

1.1. Teachers' ICT teaching competencies, according to UNESCO

Teachers' information and communication technology competencies remain a crucial element for educational development. These can be understood as the suite of necessary skills and knowledge that teachers must possess in order to make more integrated

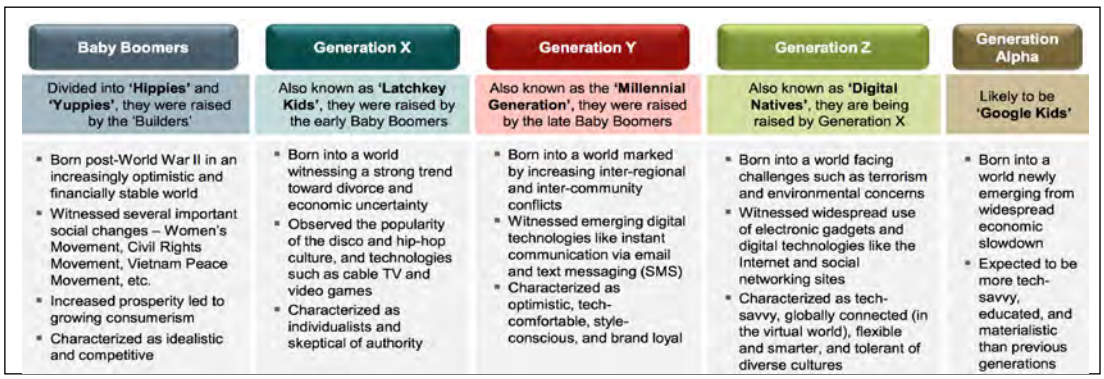

Figure 1. Generation Terminology by Birth Year (Grail Research, 2011).

use of these technological tools as educational resources in their daily practice (Suárez-Rodríguez, Almerich, & al., 2012).

As a result of the educational importance and value given to digital competencies in present day education systems over the last decade, various legislative measures have been implemented, establishing the need to include ICT competencies in the curriculum as an essential learning tool (Organic Law 2/2006, Organic Law 8/2013). Likewise, government institutions and NGOs have developed various models of ICT competency standards for teachers (Department of Education of Victoria – Australia; International Society for Technology in Education – USA / Canada; the Enlaces (learning networks) Project of the Chilean Ministry of Education –Chile; North Carolina Department of Public Instruction – USA; ICT Competency Framework for Teachers –UNESCO; PROFORTIC of Almerich, Suárez, Orellana, Belloch, Bo & Gastaldo – Spain). Each of these studies has examined the importance of teachers' digital competencies for the satisfactory development of ICT competencies in their students.

Several studies have explored teachers' lack of confidence and inadequate competence in the field of ICTs from both a technological and a pedagogical perspective (Banlankast & Blamire, 2007; Hew & Brush, 2007; Mueller, Wood, Willoughby, Ross & Specht, 2008; Ramboll Management, 2006). The conclusions drawn in most of these studies raise questions about the adequacy of both initial and continuing teacher training as regards reducing the «digital divide» between teachers and students, between «digital native» students and «digital immigrant» teachers (Prensky, 2001).

In 2008, UNESCO (2008; 2011) produced and published an extremely important document for states such as Spain, and education institutions that had not yet created any specific recommendations about what their teachers should know regarding the use of ICTs in education. The guidelines for teacher training in ICTs given in the «Planning guide» of «Information and communications technologies in teacher education» published by UNESCO in 2004 include a detailed study of «standards for teacher technology competency».

In general, the UNESCO ICT Competency Standards for Teachers project (UNESCO, 2008; 2011) is aimed at improving teachers' practice in all areas of their professional work, combining ICT competencies with innovations in teaching, the curriculum and organisation of the teaching institution. A further objective is to ensure that teachers use ICT competencies and resources to improve their teaching, cooperate with colleagues and ultimately to become innovation leaders within their institutions. The overall goal of this project is not only to improve teaching practice but also to do so in ways that contribute to improving the quality of an education system so that it furthers the economic and social development of the country (UNESCO, 2008). To this end, UNESCO has defined three levels of ICT competencies for teacher education:

- Understanding the technologies and integrating technological competencies in the curriculum (1st level: Technology Literacy).
- Use of these competencies in order to add value to society and the economy, and applying this knowledge to solve complex and real problems (2nd level: Knowledge Deepening).
- Production and subsequent leverage of new knowledge (3rd level: Knowledge creation).

These three approaches (UNESCO, 2008) correspond to alternative visions and goals for national policies on the future of education. However, each level possesses different characteristics according to the dimension analysed: 1) Policy and vision: aspects of ICTs in the curriculum; 2) Curriculum and assess-

This generational divide between teachers and students, combined with the need to develop core competencies in compulsory education (especially digital competence), adapt to new social skills related to the use of technologies and address the new learning needs of a changing society, raise questions about the preparation of current teachers for leading the teaching-learning processes that Generation Z students will use.

ment: planning and assessment of ICTs; 3) Pedagogy: ICT methodology issues; 4) ICTs: use and management of the technologies; 5) Organisation and administration: management of ICT resources; 6) Teachers' professional learning: continuing education in ICTs.

The goal of UNESCO's ICT-CST project has been to produce the UNESCO ICT Competency Standards for Teachers (ICT-CST) framework shown in figure 2.

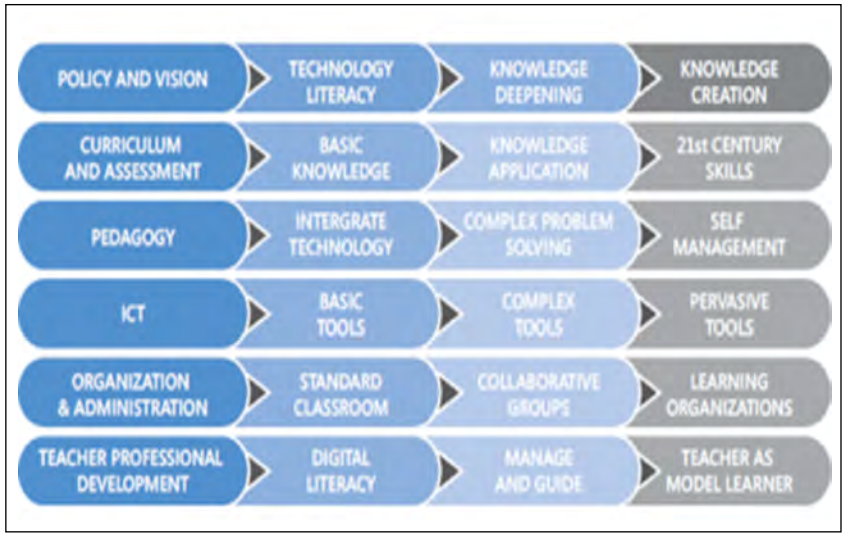

Figure 2. Modules of the UNESCO ICT Competency Framework for Teachers (UNESCO, 2008).

A study of the standards defined by UNESCO (2008; 2011) raises a number of questions which we aimed to answer in the present study: What ICT training have today's Generation Z teachers received? Are they equipped to help our students achieve digital competence? What characteristics do «digital immigrant» teachers possess? What aspects of teacher training should be improved in order to produce teachers with satisfactory digital competence? Are we are meeting our students' educational needs regarding the use of technological tools for independent learning?

The overall objective of this study was to analyse the level of ICT competencies among primary and secondary education teachers in the Community of Madrid in order to identify teacher training needs, based on a theoretical study using UNESCO's ICT competency standards for teachers and the design of an instrument which made it possible to conduct the pertinent analyses and identify the factors associated with differences in the ICT teacher training profile.

2. Material and methods

This was a non-experimental study, since it was not possible to manipulate the variables or randomly assign participants or treatment (Kerlinger & Lee, 2002). It therefore comprised an «ex-post-facto» study in which it was necessary for the phenomenon to occur naturally and conduct subsequent analyses, as the independent variables could not be manipulated.

2.1. Sample

The study was conducted with teachers working in primary and secondary schools in the Community of Madrid; 80 primary schools and secondary schools participated, of which 43.75% were public schools, 11.25% were private and 45% were state-funded private schools. The establishment of the core competencies defined in the 2006 Education Act and in the 2014 Organic Law for the Improvement of Educational Quality has meant that all schools in the Community of Madrid are required to include the development of digital competencies in the curriculum.

A total of 1,433 teachers participated, of whom 66.57% were female and 33.43% male. Participants were selected by means of incidental non-probability sampling (Kerlinger & Lee, 2002; Bisquerra, 2004); 70% of the study participants were aged between 26 and 45 years old (Generation X), 81.09% were teachers (the rest were members of the management team or ICT coordinators) and 35.05% had between 0 and 5 years of teaching experience. A total of 53.73% of the teachers who participated in the study taught in primary education, 42.78% taught in secondary schools and 3.49% taught at both educational levels.

2.2. Design of the instrument

To carry out this study, a questionnaire was developed as a tool for collecting information to assess the ICT teacher training profile of teaching staff in the Community of Madrid, and identify the underlying and observable relationships between the dimensions and variables studied.

The questionnaire consisted of a series of items referring to the ICT teacher training profile according to UNESCO. Subjects responded to each item by indicating their score, situation, knowledge or attitude using a 5-point Likert-type scale where 1 was the lowest score and 5 was the highest score.

The variable studied (the dependent variable) was the ICT teacher training profile (UNESCO), establishing three different profiles: Profile 1: Technology literacy; Profile 2: Knowledge deepening; Profile 3: Knowledge generation.

To better define the dependent variable, and in accordance with the standards established by UNESCO, this was divided into the following sub-dimensions, which were subsequently operationalised in the questionnaire items: curricular aspects of ICTs, planning and assessment of ICTs, methodological aspects of ICTs, use of ICTs, management of ICT resources, continuing education in ICTs.

2.3. Instrument reliability

The SPSS statistical package was used to study the reliability of the instrument (George & Mallery, 1995), employing Cronbach's α. This is the most widely used coefficient in this kind of analysis, and it indicates the internal consistency of a scale. An analysis of the overall α obtained for the instrument yielded the results shown in table 1.

Homogeneity indices (corrected item-total correlation) were within what could be termed «Excellent», as they were all above 0.3. In conclusion, the instrument employed to study the ICT teacher training profile presented excellent reliability, obtaining a Cronbach's α of .973 (George & Mallery, 1995).

3. Analysis and results

3.1. Descriptive and differential analysis

The overall score obtained was 2.78 on an assessment scale of 1 to 5, indicating that the ICT training profile of schools in the sample was medium-low. Almost 39.71% of the teachers possessed an «Average» ICT training profile (UNESCO), although it should be noted that 36.85% had a «Poor» profile and 9.56% had a «Very poor» profile. In other words, a total of 46.31% of teachers presented a negative profile in terms of ICT training in education. The 20, 40, 60 and 80 percentiles were used for these assessments, enabling us to identify a «Very poor profile» with scores below 1.6, a «Poor profile» with scores between 1.7 and 2.5, an «Average profile» with scores between 2.6 and 3.4, a «Good profile» with scores between 3.5 and 4.3, and a «Very good profile» with scores between 4.4 and 5.

Table 2 summarises the differential analyses conducted to identify the variables influencing the ICT teacher training profile according to the UNESCO standards in each of the sub-dimensions. Two statistical tests were used for this, the Student's t-test and one-way ANOVA, both for independent groups (together with subsequent Scheffé contrasts). In the differential analyses, the value of statistical power (P) was added to determine the rejection or acceptance of the hypothesis with a higher degree of certainty and significance. Therefore, when significance was high and power was close to 0.8, the values were considered significant Cohen, 1992).

The differential analyses performed (ANOVA - $p \leq 0.01$) according to the «Post» variable (Teacher, ICT Coordinator and Management and Coordination) clearly indicated significant and important differences in all sub-dimensions (CA, PA, MA, ICT, MR and CE) and in the questionnaire in general (0.000 sig. and 23.819 F), and as was to be expected, those who were ICT coordinators presented a higher level in the ICT teacher training profile.

When the Student's t-test was applied to the «Sex» variable (with an alpha of 0.05), no statistically significant differences were observed in any of the sub-dimensions or in the questionnaire in general (0.158 sig.), and no differences were obtained between men and women in relation to their ICT teacher training profile.

However, an analysis of the «Age» and «Teaching Experience» variables (ANOVA - $p \leq 0.01$ = 0.000 sig. /9.826 F for Age and 0.000 sig. /9.942 F for Experience) indicated that teachers who were older (56 - 66 years old) and had more teaching experience

Table 1. Analysis of instrument reliability: Cronbach's α

UNESCO ICT TEACHER PROFILE	No. items	Cronbach's α	Reliability
	63	**.973**	**Excellent**
DIMENSION	No. items	**Cronbach's α**	**Reliability**
General Curricular Aspects (CA)	3	.738	Acceptable
Planning and Assessment (PA)	10	.878	Good
Methodological Aspects (MA)	14	.903	Excellent
Use of ICTs (ICT)	21	.935	Excellent
Management of ICT Resources (MR)	8	.896	Good
Continuing Education in ICTs (CE)	7	.894	Good

presented a much lower level of ICT teacher training profile than teachers who were younger and had less experience, and teachers aged between 20 and 25 years old had the best profile.

As regards the variable «Degree» held by teachers (ANOVA - p<.01), the analyses only revealed statistically significant differences in some sub-dimensions (PA, ICT and CE), while for the questionnaire in general (0.014 sig. and 4.248 F) there was lack of significance in the difference of variation between groups (teaching and undergraduate degrees). The mean differences in all sub-dimensions presented very low levels of statistical significance and were not considered relevant in the ICT teacher training profile in relation to the degree held.

Table 2. Analysis of differences by sub-dimensions and questionnaire

		Sub-dimensions						
		CA	PA	MA	ICT	MR	CE	Questionnaire
Post - ANOVA (p <.01)	F	21.023	14.29	7.868	14,463	39.167	14.934	23.819
	Sig.	.00	.00	.00	.00	.00	.00	.00
	P	1	0.992	0.858	0.993	1	0.995	1
Age - ANOVA (p<.01)	F	3.007	4.121	6.966	17.374	6.821	15.072	9.826
	Sig.	.01	.001	.00	.00	.00	.00	.00
	P	0.693	0.87	0.992	1	0.991	1	1
Sex - Student's t-test (p<.05)	F	2.053	0.529	0	0.833	5.411	0.455	1.995
	Sig.	.152	.467	.992	.362	.02	.5	.158
	P	0.933	0.985	0.885	1	0.981	0.939	0.997
Experience - ANOVA (p<.01)	F	2.414	3.326	7.101	18.668	4.64	16.744	9.942
	Sig.	.034	.005	.00	.00	.00	.00	.00
	P	0.552	0.755	0.993	1	0.917	1	1
Degree - ANOVA (p<.01)	F	1.386	8.211	4.081	8.028	2.571	11.005	4.248
	Sig.	.25	.00	.017	.00	.077	.00	.014
	P	0.126	0.876	0.496	0.867	0.282	0.963	0.519
Stage - ANOVA (p<.01)	F	3.753	17.156	10.197	12.354	0.971	16.34	8.614
	Sig.	.024	.00	.00	.00	.379	.00	.00
	P	0.451	0.998	0.946	0.98	0.081	0.997	0.895
Subjects - ANOVA (p<.01)	F	1.911	10.866	5.383	9.558	7.603	4.782	6.972
	Sig.	.09	.00	.00	.00	.00	.00	.00
	P	0.414	1	0.959	1	0.996	0.927	0.992
ICTs at home - ANOVA (p<.01)	F	6.833	12.084	7.545	24.906	8.583	22.599	17.223
	Sig.	.001	.00	.001	.00	.00	.00	.00
	P	0.79	0.977	0.839	1	0.893	1	0.998
Usefulness - ANOVA (p<.01)	F	24.944	17.596	15.813	18.1	12.945	22.189	24.969
	Sig.	.00	.00	.00	.00	.00	.00	.00
	P	1.	0.999	0.997	0.999	0.985	1	1
Attitude - ANOVA (p<.01)	F	38.761	17.379	19.647	20.448	21.493	27.921	32.947
	Sig.	.00	.00	.00	.00	.00	.00	.00
	P	1.	0.999	1	1	1	1	1
Level ICT Training - ANOVA (p<.01)	F	79.374	96.432	74.843	157.14	112.28	92.616	147.19
	Sig.	.00	.00	.00	.00	.00	.00	.00
	P	1	1	1	1	1	1	1
ICT training received - ANOVA (p<.01)	F	53.448	33.409	32.083	54.242	56.942	37.104	61.205
	Sig.	.00	.00	.00	.00	.00	.00	.00
	P	1.	1	1	1	1	1	1

The «Educational Stage» variable was also analysed (ANOVA - p<.01), revealing statistically significant differences in almost all sub-dimensions (except CA and MR) and in the questionnaire in general (0.000 sig. and 8.614 F), and an important difference of means, whereby teachers working in secondary education presented a better profile than those working in primary education.

Similarly, important significant differences (ANOVA - p<.01) (questionnaire 0.000 sig. and 6.972 F) were observed between teachers forming the study sample for the «Subject Taught» variable, whereby teachers in the fields of Technology and the Experimental Sciences presented a better ICT teacher training profile.

Lastly, the final differential analyses (ANOVA - p<.01) revealed important and statistically significant differences regarding the «Technologies at Home», «Usefulness of ICTs», «Attitude towards ICTs», «Level of ICT training» and «ICT training received» variables. The data obtained indicated that teachers who had a computer and Internet access at home were convinced of the usefulness of ICTs for improving the teaching-learning process, presented a good attitude, had a good level of training in ICTs, had received both technical and teacher training on the use of ICTs, and had a better ICT teacher training profile

according to the UNESCO standards. These data were corroborated by the values of statistical power, all above 0.8 (Cohen, 1992), indicating a high probability of obtaining a statistically significant result.

4. Discussion and conclusions

Teacher training in the application of ICTs in education has a long way to go, and requires identification of the factors that can help improve the competencies that current and future teachers must acquire in order to implement digital literacy in our schools.

This study has revealed the existence of a significant deficit in teacher training in the use of ICTs and their application in the classroom, an inherent aspect of digital competence established by Organic Law 2/2006 and Organic Law 8/2013.

According to the sub-dimensions established by UNESCO (2008; 2011), it can be concluded that the ICT teacher training profile corresponds to a medium-low level. As has been seen in the sub-dimension of «General curricular aspects», most teachers do not know what is meant by digital competence in education or how to achieve this in the classroom. Similarly, the results for the «Planning and assessment» sub-dimension indicate that further work is required as regards planning activities and assessment of competencies by means of rubrics with the incorporation of ICT resources. Continuing in this pedagogical line, one of the most important sub-dimensions for the definition of the ICT teacher training profile is that of «Methodological and instructional aspects». The results of this study have revealed that teachers' classroom strategies regarding the use of ICT resources as an avenue for complex and collaborative learning have not yet been implemented as teaching methods in the development of students' digital competence.

The poor results obtained for teachers' instructional application of ICT resources may be explained by the data provided by the sub-dimension «Use of ICTs». This sub-dimension has made it possible to assess teachers' technical competencies regarding the use of technologies, yielding a very low profile among teaching staff. This is one of the problems facing the incorporation of ICTs in education: if teachers do not possess technical knowledge about the use and application of digital tools, these are unlikely to be implemented in education. Teachers' lack of knowledge about the use of technological tools effectively prevents them from applying these in educational activities with their students, as has been reported in other studies (Suárez-Rodríguez, Almerich, & al., 2012). These conclusions are supported by the results obtained for the sub-dimension «Continuing teacher education in ICTs», which revealed a considerable need for teachers working in public and private schools to update their knowledge. Although there are many training courses related to ICTs in education promoted by the different authorities, only a very small percentage of teachers attend these courses, as described in European Union reports (Eurydice, 2011) which state that only 16% to 25% of primary education students are taught by teachers who have participated in continuing education programmes on the use of ICTs.

Lastly, the sub-dimension «Management of ICT resources» obtained very low results, supporting the idea that an ICT coordinator is an indispensable member in the school.

Based on the structure suggested by UNESCO regarding ICT teacher training profiles, it can be concluded that:

- Teachers who are older (56 - 66 years old) and have more teaching experience present a much lower ICT teacher training profile than teachers who are younger and have less experience, and teachers aged between 20 and 25 years old have the best profile.
- No large discrepancies exist between primary and secondary school teacher profiles. Both obtained a poor profile according to UNESCO indicators. This suggests that the initial training of both teaching professionals (teaching degree or diploma for the former and a master's degree in secondary education for the latter) exerts no influence on the application of ICT tools in education, and further reveals the limited training that pre-service teachers receive in terms of digital competence in education faculties, as reported by Prendes and others (2010).
- This study indicates that teachers working in secondary education have a better profile than those teaching in primary education. As the above suggests, although the initial qualification does not lead to a better or worse teacher training profile, continuing professional development (life-long learning) does endow secondary education teachers with greater specialisation in digital competence throughout their professional careers.
- As corroborated by this study, science and technology teachers present better digital competencies; teachers in the fields of Technology and the Experimental Sciences possessed a better ICT teacher training profile.
- Other studies (Tejedor, 2014) have shown that teachers with ICT tools at home present a better attitude and better training in the use of these resources in education. Likewise, in the present study, teachers who had a computer (PC, laptop, tablet or smartpho-

ne) and an Internet connection at home presented a better ICT teacher training profile.

• As regards attitude and inclination towards ICTs, the results also indicate that there is a better ICT teacher profile among teachers who believe in the usefulness of these technologies in education, have a positive attitude and are convinced of their usefulness for improving the teaching-learning process, as has been reported in numerous studies (Alonso & al., 2014).

• This study has highlighted the need for teachers to be trained in the application of digital competence in the classroom. Thus, teachers who have received training that combined technical aspects of the use of technological tools and pedagogical aspects regarding their instructional application in learning activities, had a better ICT teacher training profile according to UNESCO standards.

The results suggest that further work is required in terms of incorporating information and communication technologies in education into teacher training programmes, whether in education faculties as part of the initial training or on courses organised by public and private education institutions that promote continuing professional development in order to develop digital competence among teachers. They also highlight the considerable difference between Generation Z, corresponding to students currently attending our primary and secondary schools (basic education in which they must develop digital competence according to the LOE and LOMCE) and the scant training received by present day teachers to implement this. It is therefore important to define teacher training programmes (both initial and continuing) in greater depth in order to help improve the training teachers receive in relation to digital competence and reduce the «digital divide» between teachers and their students.

In sum, this study has revealed clear indications of a lack of preparation among current teaching staff to facilitate the development of digital competence in students. Clearly, teachers cannot help students develop a competence that they themselves do not possess in depth.

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