Comunicar

Ethics and Plagiarism in Scientific Communication

Ética y plagio en la comunicación científica

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DOSSIER

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• Dr. Jaume Sureda-Negre, University of the Balearic Islands (Spain)
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Comunicar 48

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Ethics and plagiarism in scientific communication

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Dr. Jaume Sureda-Negre, University of the Balearic Islands (Spain)
Dr. Karl O. Jones, Liverpool John Moores University, (United Kingdom)
Dr. Rubén Comas-Forgas, University of the Balearic Islands (Spain)

Plagiarism and Academic Integrity in Germany

Plagio e integridad académica en Alemania

iD Dr. Germán Ruipérez is Full Professor at UNED and Director of the Chair in eLearning at the Universidad Camilo-José Cela of Madrid (Spain) (german@ruiperez.org) (http://orcid.org/0000-0002-7586-6330)

iD Dr. José-Carlos García-Cabrero is Associate Professor at the Universidad Nacional de Educación a Distancia of Madrid (Spain) (jcgarcia@flog.uned.es) (http://orcid.org/0000-0003-0163-4083)

ABSTRACT

Since the 18th century, Germany is perhaps one of the European countries that has had the most intense public debate on dishonest scientific and academic practices, particularly in relation to doctoral theses. This debate was particularly productive in the late 19th century, giving rise thereafter to the obligatory publication of all doctoral theses as a prior requisite before the title of Doctor can be conferred by any German university. This paper presents the most significant progress regarding plagiarism and academic integrity, especially since the 2011 scandal concerning plagiarism in the doctoral thesis of the Minister Guttenberg, such as the creation of an effective collaborative investigation method for plagiarism in a scientific or academic work using the Internet and social media, which resulted in the «VroniPlag» Wiki. Also, the last two years have seen the definitive consolidation of the figure of «Ombudsman for Science» as a national instrument to prevent, manage and combat scientific dishonesty, as well as the publication in 2013 of a new version of the reference manual in this regard, «Safeguarding Good Scientific Practice». Finally, this paper analyses the conclusions of the German experience about academic ethics from a historical perspective, since its recent achievements and progress can serve as a reference for other European countries.

RESUMEN

Alemania es quizá uno de los países europeos que, ya desde el siglo XVIII, ha mantenido un debate público más intenso sobre prácticas científicas y académicas deshonestas, relacionadas especialmente con tesis doctorales. Este debate fue especialmente productivo a finales del siglo XIX, dando lugar desde entonces, para evitar estas prácticas inaceptables, a la obligatoriedad de publicar todas las tesis doctorales, como requisito previo a la expedición del título de doctor por cualquier universidad alemana. Este trabajo analiza los avances más importantes en plagio e integridad académica en Alemania, especialmente después del escándalo surgido en 2011 a raíz del plagio de la tesis doctoral del Ministro de Defensa Guttenberg, como son la creación de una eficaz metodología colaborativa de investigación del plagio en trabajos científicos o académicos utilizando Internet y las redes sociales, materializada en la Wiki «VroniPlag». También se describe someramente en este trabajo la consolidación definitiva de la figura del «Defensor de la Ciencia», como instrumento de ámbito nacional para prevenir, gestionar y combatir la deshonestidad científica, aparte de la publicación en 2013 de una nueva versión del manual de referencia al respecto «Sicherung guter wissenschaftlicher Praxis». Por último se analizan las conclusiones de la experiencia alemana relacionada con la ética académica, también desde una perspectiva histórica, pues sus recientes logros y avances pueden servir de referencia a otros países europeos.

KEYWORDS | PALABRAS CLAVE

Academic plagiarism, academic integrity, ombudsman, intellectual property, educational software, wikis, ethics, social networks.
Plagio académico, integridad académica, defensor, propiedad intelectual, software educativo, wikis, ética, redes sociales.

1. Introduction

In Germany there has been a constant reflection on academic plagiarism and other dishonest research practices since the late 19th century (Schwinges, 2007). However, 2011 became a landmark year with the appearance of an extensive public debate as a consequence of the case of the doctoral thesis by the German Defence Minister, Karl-Theodor zu Guttenberg, who eventually had to resign. Aside from the numerous cases detected in academic work since 2011, several initiatives have come about in parallel that have enriched the debate on academic plagiarism, for example, the development of a consolidated cooperative textual research methodology using a specific Wiki called «VroniPlag» (http://goo.gl/JZOSKZ), making Germany one of the most advanced European countries when it comes to combating these practices.

This article essentially pursues two objectives. Firstly, we propose analysing the German experience of plagiarism, which has been heavily influenced in recent years by social media, and we also consider the historical perspective in order to better understand specific cases of recent years. Secondly, we want to analyse the most significant progress achieved in Germany to define, prevent, manage and pursue academic and research dishonesty –especially plagiarism– that has occurred historically, always as a consequence of scandalous cases.

2. Definition of plagiarism (Plagiat)

The first difficulty we encounter when it comes to discussing plagiarism is reaching a consensus with regard to its definition. We can find at least three different versions: what it means from a strictly legal point of view, its colloquial use as a synonym of «action of copying» and finally, plagiarism from an academic perspective.

We will analyse these different meanings according to the ideas of Weber-Wulff (2014), Rommel (2011) and Weberling (2015), among others.

2.1. The legal arena

The term plagiarism (Plagiat) is never literally cited in the German Penal Code, since jurists deem it to be a colloquial term to refer to a particular case of copyright infringement considered in Article 23 of the German Intellectual Property Act (Urheberrechtsgesetz), which states that «preparations or other types of transformations of a work can only be published or used with the permission of the original creator of the prepared or transformed work»[1] (Rehbinder & Peukert, 2015; Ruipérez, 2010). Furthermore, according to

Article 97, when a person consciously appropriates the authorship of a thought belonging to a third party, thereby infringing existing copyright or exploitation rights, this is unlawful plagiarism that grants the right to compensation (Rehbinder & Peukert, 2015). Therefore, in order to talk of unlawful plagiarism in the German legal sense, the existence of recognised copyright of the original work has to converge with the intention to deceive (Dreier & Ohly, 2013; Kastner, 1983; Waiblinger, 2012).

The existence of the copyright or exploitation rights of the original work is a clearly objective element. Therefore, if an author literally reproduces text that lacks any legal protection, we could not legally talk of plagiarism, since there would be no infringement of any third party rights. However, it could be said to be academic plagiarism, as we will explain in the following sections (Dreier & Ohly, 2013). In addition, if an author cites a third party in accordance with the academic reference regulations in his area of knowledge, we could not talk about academic plagiarism, but, in the end, we could talk of an unlawful event from a legal point of view if it was, for example, a very extensive and unjustified citation in its own context. This could be an infringement of the citation right considered in Article 51 of the German Intellectual Property Law (Rehbinder & Peukert, 2015).

The intention to deceive and the knowledge of the original work is a subjective element and can, therefore, be difficult to prove. In order for unlawful plagiarism to be attributed to a person, the said person has to have acted consciously, and it is necessary to prove the express premeditation or intention of the deceit. For example, if several paragraphs originally written by a third party are literally reproduced without citing the aforementioned third party, and without using quotation marks, this would be evident proof of the will to commit fraud. The intention to deceive would also be proven if, for example, an author commits the same error as a specific publication upon citing an original source, since it can be inferred that the said original source was not consulted, but rather that it was copied from the publication that was expressly not mentioned, with the original misprint included (Weberling, 2015). However, the mere fact that a thought or idea belonging to a third party is reproduced in a written work does not necessarily imply unlawful plagiarism, since it may have been a casual reproduction that was done unconsciously. From a German legal point of view, this would not be plagiarism, but rather a «double creation» or «Doppelschöpfung» phenomenon. According to German legal terminology: two authors casually

write about the same thought or idea without either of them being aware of the other (Braun, 2015). Given that we are only referring to the German context, we will not compare it to the Spanish context, in which the legal definition of plagiarism is different from the one discussed here (Castán, 2009; Ortega, 2015; Rui-pérez, 2009; Temiño, 2015).

2.2. Colloquial use

The term for plagiarism in German, «Plagiat», comes from the Latin word «plagium» (theft of slaves, in turn related to the Greek form πλαγιος, deceitful). It originally means buying a free person as if he were a slave, and holding him as such. There appears to be a reference in the late 19th century Grimm Brothers' dictionary (Grimm & Grimm, 1999), understood only in the sense of «literary theft» (literarischer Diebstahl). Subsequently, the German Duden (2009) dictionary offers a more long-winded definition, which is the most extensive in the colloquial use of the term, and whose entry mentions that it is about the «improper appropriation of thoughts, ideas or similar of a third person in the artistic or research, and its publication. Theft of intellectual property; [legal language] intellectual theft, forgery».

plagiarism, as well as when any kind of periphrasis based on an original that is not cited is used. Secondly, plagiarism is committed when the primary author is not sufficiently identified – in other words, when a direct attribution that would be expected by the reader does not appear. Thus, for example, when ideas from a work have been used, it would not be sufficient to include such work in the bibliography as another reference, but rather it would be necessary to always cite it on whichever pages the singular thoughts or

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ideas–are being used. Lastly, it is not necessary for there to be financial gain, since the intention to obtain public recognition for apparently being the author of an idea or thought of a third party not named or insufficiently cited would be sufficient.

After the extensive debate that came about after the 2011 scandals, the concept of academic plagiarism currently dominates the German arena (Weber-Wulff, 2014). It is no longer deemed essential for the subjective intention to deceive –which is always difficult to prove– to exist in order to qualify an act as academic plagiarism, but it would be necessary to argue this in order to deal with the case from a legal point of view.

This view is already documented by English (1933) who, after a detailed study of plagiarism cases, concludes his work with the following definition (Bluhm, 2014; Fishman, 2009): «plagiarism is, therefore, the action of extracting, for one's own work, at the

2.3. The academic world

Academic plagiarism (akademisches Plagiat) in the German research arena has certain similarities with the more extensive meaning in the international community. Therefore, the definition of Fishman (2009) is often cited: «Plagiarism occurs when someone: 1) Uses words, ideas, or work products. 2) Attributable to another identifiable person or source. 3) Without attributing the work to the source from which it was obtained. 4) In a situation in which there is a legitimate expectation of original authorship. 5). In order to obtain some benefit, credit, or gain which need not be monetary».

Therefore, it is a phenomenon with very specific characteristics. Firstly, reproducing someone else's text without quotation marks can be deemed academic

discretion of a said author or artist, from a not insignificant idea of a third party, with the intention of erasing the origin of this forced loan via the respective transformation, thereby giving the reader or viewer the impression of an own creation».

3. Doctoral theses and dishonest conduct

In Germany, at least since the 16th century, the title of Doctor has been considered by society to be almost equal to a noble title. From a legal point of view, this is not so, since the Chamber for Contentious Administrative Proceedings of the German High Court explicitly denied this in a sentence on 24 October 1957. Furthermore, it clarified that it also did not form part of the particulars of an individual, despite the fact that the title of Doctor is explicitly mentioned on the German ID card, passport and driving licence. Ultimately, it is an academic title, perceived by society as a title granting high social prestige (Weber-Wulff, 2014; Herb & Kovac, 2012; Höhner, 2014; Walger, 2014).

This perceived elevated status has put great pressure on any German with a public profile to achieve such a title, even if obtaining it means using ethically questionable procedures. Examples of this include the doctoral theses of Marx, Goethe and Einstein, to name just the more important cases, who, thanks to their social influence –and by possibly making a payment– successfully obtained the title of Doctor from certain universities for papers of little or almost zero research significance and, in some cases, with rather opaque procedures.

The doctoral thesis of the already then famous writer Johann Wolfgang von Goethe (1749-1832) was reduced to a manuscript of 12 pages entitled «Positiones Juris», and consisted of only 56 aphorisms in Latin, written with the help of a «repeater» or preparer, a euphemistic name for which today we would use the term «ghostwriter» (Groh, 2012; Bambach, 2013). After previously submitting another unsatisfactory doctoral thesis that was rejected, on 6 August 1771, Goethe publically defended his thesis at the Faculty of Law of the University of Strasbourg and was awarded the unusual qualification of «cum applausu» (Cross & Luhmann, 1971).

This eagerness of the German bourgeoisie to obtain a doctorate in order to always be cited with the title of Doctor before their surname continued to a large extent in the 19th century, when some universities with little prestige, such as those of Gießen, Jena and Rostock, came to offer titles «in absentia»: the candidate only had to pay an amount of money and did not even have to transfer to said university. Such is the case, for example, of the Berlin student Karl Marx, who in 1841 obtained the title of Doctor from the Faculty of Philosophy of the University of Jena that he never visited, through an agreement of which only a few fragments remain today (Rasche, 2013; Cross & Luhmann, 1971).

The fact that at a small university such as Jena, almost three times more students were awarded a doctorate between 1830 and 1870 than at the Universities of Berlin and Munich combined led Mommsen to start a great campain in 1876 against gaining a doctorate in absentia, with the intention of ending the purchase of titles by these «pseudo doctors» (Schwinges, 2007).

One of the most effective measures was the obligation to publish hard copies of all doctoral theses, a requirement that remains today and is mandatory in order to definitively issue the title of Doctor at any German university, even though the procedure is now becoming more flexible in order to also permit, as an alternative, the possibility of publishing online, but with extensive diffusion always guaranteed (Rasche, 2007 and 2013).

Despite the restrictive measures that were promoted, at the initiative of Mommsen, at universities dependent on the then Prussian parliament, in 1905 Albert Einstein was still permitted to obtain the title of Doctor at the University of Zurich with a thesis consisting of 17 pages. He had had a previous, even shorter, thesis rejected and was reproached because the final version of his academic work included quite a lot of errors in the mathematical formulae (Bambach, 2013).

Nevertheless, despite these transparency initiatives, social pressure to achieve a doctorate continued in the 20th century, so much so that the irregular procedures to obtain the longed-for title of Doctor with little effort evolved, giving rise to authors resorting, for example, to plagiarism. The first significant case was that of Friedrich Wilhelm Prinz von Preußen, Prince of Prussia and great grandson of the last German Kaiser, who obtained his doctorate at the University of Erlangen in 1971 with a thesis on contemporary history. The obligatory paper publication meant that it was available for consultation and an employee at Marburg library specialising in the same subject noticed that some passages were familiar. When he made the first comparison, he quickly detected clumsy plagiarism, since almost two-thirds of the 1971 thesis was a literal copy of three different books (published in 1939, 1945 and 1968) that were not cited anywhere (Der Spiegel, 1973).
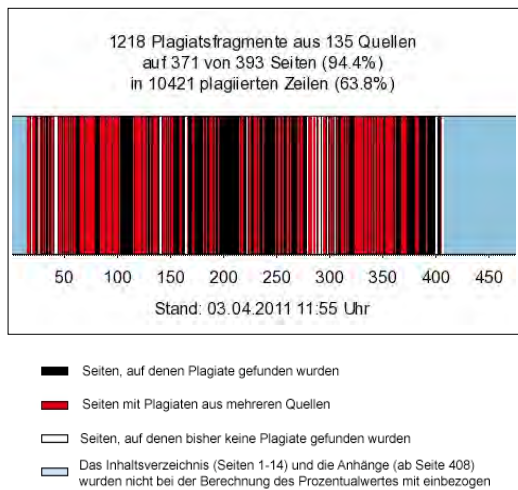
Figure 1: Barcode resulting from the investigation of plagiarism in the doctoral thesis of Karl-Theodor zu Guttenberg (GuttenPlag Wiki) (http://goo.gl/dtspm) (2015-11-21). Title: 1,218 passages of plagiarised text from 135 sources in 371 of 393 pages (94.4%), and 10,421 plagiarised lines (63.8%). Date: 2011-04-03, 11:55 am.

Barcode colours: black (pages where plagiarised text fragments were found); red (pages where plagiarised text fragments from different sources were found); white (pages where so far no plagiarised text fragments were found); blue (index, pages 1 to 14, and annexes, from page 408, were not included in the calculation of the percentage values).

In this case, it was his doctoral supervisor who, after an exhaustive study and in accordance with the 1931 regulatory law on academic titles, proposed in 1973 that the University of Erlangen strip the Prince of Prussia of his title of Doctor. This disciplinary measure was not necessary in the end, since the author himself asked the university if he could «voluntarily» renounce his title of Doctor (Weber-Wulff, 2014).

3.1. The plagiarism of Karl-Theodor zu Guttenberg and the importance of social media

The plagiarism case that had the greatest media impact occurred in 2011. It was also a doctoral thesis and written by a member of the German nobility: the then German Defence Minister, Karl-Theodor zu Guttenberg, who gained his doctorate from the Faculty of Law of the University of Bayreuth. The scandal was triggered by a report on 16 February 2011 published by Süddeutsche Zeitung, announcing the possibility that the then Defence Minister may have committed plagiarism in his doctoral thesis. A Professor of Public Law at the University of Bremen, Fischer-Lescano, informed the newspaper of these facts after writing a review of Guttenberg's thesis for the magazi-

ne Kritische Justiz, in which he detected that 23 long paragraphs not in quotation marks from the said thesis were copied literally from other publications that he documented in his review (Fischer-Lescano, 2011).

This news, despite Guttenberg's emphatic denial, immediately went viral thanks to the conclusive proof provided by Süddeutsche Zeitung. The immense media exposure caused different events to occur that precipitated the resignation of the Defence Minister within a few short days, who, before resigning and to minimise the damage, asked the University of Beyreuth if he could «voluntarily» renounce his title of Doctor.

In this context, the importance of social media should be stressed, since just one day after the publication of the aforementioned report, a Wiki called GuttenPlag appeared, which made it possible for much additional evidence of said plagiarism to be collaboratively and openly documented in record time. The result of this initiative was finalised approximately one month after an exhaustive documentation of all the plagiarised passages, and whose visual summary consisted of a multicolour barcode that has since become the icon of all the plagiarism cases subsequently investigated (figure 1).

The horizontal axis refers to the 475 pages of Guttenberg's thesis and tells us that a total of 1,218 textual fragments plagiarised from 135 different sources were documented (some of which were not even cited or were insufficiently referenced) on 371 pages of a total of 393 investigated pages; in other words, in 94.4% of the pages of his work, excluding the 14 pages of the index and the 67 pages of annexes – equivalent to 10,421 lines of plagiarised text, that is, 63.8% of the total.

The GuttenPlag experience gave rise to the drawing up of a new methodology for the documentation of plagiarised textual fragments that has since served as a reference for the investigation of subsequent plagiarism cases in a new Wiki called VroniPlag (Weber-Wulff, 2012). The coloured code used in the first Wiki was later taken on by the second Wiki with some improvements, to a large extent making it possible for any person to quickly have an idea of the extremely high degree of plagiarised fragments found in the thesis being studied.

Since academic plagiarism was evident from the start, the Prosecutor General of the German State opened an office to investigate presumed infringements of the Intellectual Property Act. The investigation concluded two months later, stating that of all the plagiarised fragments, only 23 were truly unlawfully plagiarised, since they were original texts protected by law and
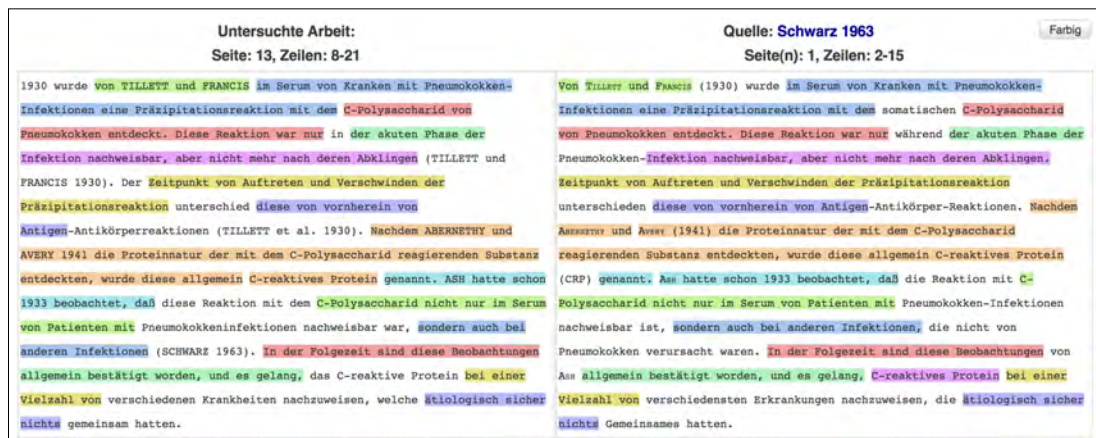
Figure 2: Textual parallelisms found on page 13 of the 1990 doctoral thesis submitted by Ursula von der Leyen (left) and an original publication from 1963 (right) (http://goo.gl/ZVUXDb) (2015-12-23).

because the intention to defraud was also accredited. For this reason, the now former Minister and former Doctor Guttenberg reached an agreement with the prosecutor with regard to his punishment and ended up paying a generous donation to a foundation in order to suspend the criminal proceedings, since, according to the prosecutor, the financial harm caused to each of the plagiarised authors had been marginal (Weber-Wulff, 2014).

3.2. The VroniPlag Wiki

Barely one month after the appearance of the pioneering GuttenPlag, dedicated exclusively to the plagiarism in Guttenberg's doctoral thesis, a new Wiki came into being that was more generally dedicated to cases of plagiarism, in particular in doctoral theses, reaching a total of 154 documented cases in December 2015.

Weber-Wulff (2012) and Schmolke (2011) highlight the main features of this Wiki. The first thing to highlight is the anonymity of its contributors; the reports can be anonymous and usually are, in order to avoid personal reprisals. The important thing is the textual investigation of the academic work and not who the author of each contribution is. However, the anonymity of most of the contributions is one of the aspects most criticised by this Wiki's detractors, since it allows people who are not qualified in the research subject to report supposed textual parallelisms that might not in the end be qualified as plagiarism. In its defence, VroniPlag argues, in our opinion with sufficient grounds, that in order to search for these intertextual coincidences, it is not necessary to have a specific qualification related to the subject of the academic work being investigated. Secondly, a significant num-

ber of plagiarised fragments must be found, so that for a certain academic work to be recognised as suspicious, there must initially be a significant number of plagiarised passages.

Thirdly, visual presentation is encouraged. The systematic use of different colours when it comes to marking textual parallelisms is a general resource. For example, the following figure 2 shows this information on the 1990 doctoral thesis defended by the current Defence Minister, Ursula von der Leyen, which is also being investigated.

The most characteristic feature of this visual presentation is the barcode used as the final summary (figure 3) inspired by the one used by GuttenPlag.

The absence of requests for disciplinary measures should also be highlighted; VroniPlag has never been understood as a platform that claims a certain disciplinary measure. Therefore, each university has the autonomy to undertake whatever initiatives it deems appropriate from this information. However, it is certain that the documented cases of plagiarism have exerted much pressure on the universities affected thereby to at least start an internal investigation. In fact, of the 154 academic works investigated up to December 2015, the universities had already stripped 22% of the authors of their respective academic title (Garditz, 2014; Kingreen, 2015).

The number of investigated cases continues to grow, given that plagiarism in German doctoral theses has not stopped. For example, in 2013 the resigning Education Minister, Annette Shavan, was stripped of her title of Doctor, obtained 33 years earlier by the University of Düsseldorf. The fact that academic plagiarism has not stopped has led the most important state body for research, Deutsche Forschungsge-

meinschaft (DFG), to publically state that the liability of any author of an academic work be temporarily limited to a maximum of 10 years, thereby limiting the permanent legal insecurity of any German holder of a university degree, who can currently be required to be liable for life for his doctoral thesis (Löwer, 2015; Rieble, 2014; Deutsche Forschungsgemeinschaft DFG, 2013). Finally, we must highlight the consolidation of an advanced collaborative investigative methodology that is applied statistically in most new public plagiarism investigations.

4. Final considerations

The debate on academic and scientific ethics continues in Germany, and is usually linked to the public investigation of plagiarism in an academic work by a politician. Between 2011 and 2015, the German experience gave rise to some significant advances, the most important of which is the figure of the Research Ombudsman (Ombudsmann für die Wissenschaft), which has served as a catalyst for most initiatives. Since its beginnings in 1997, it has been a governing body that investigates reports of research malpractice, and has always been governed by the principle of transparency and strict confidentiality in all its arrangements, and also guaranteeing the anonymity of the reporter.

The Research Ombudsman has become the expert in matters of research and academic ethics in Germany, not only because of its effective management of conflicts, but also because of it the extensive diffusion of a self-monitoring manual. According to the latest available data, in 2014 the Research Ombudsman received 63 reports, though only nine led to the opening of specific proceedings because the outcome would not have been satisfactory. Over half were related to evident topics of academic honesty: 32% were for authorship conflicts (usually due to the omission of some collaborator in works signed by the academic supervisor or project head), and 22% for plagiarism. The remaining reasons affected collateral research topics (labour conflicts, insufficient financing, discrepancies in research content, etc.), with the exception of 3% of reports received for falsifying data (Lower, 2015). Similarly, most universities have created their own Research Ombudsman office, which has given rise to the standardisation of criteria to define and pur-

sue dishonest conduct. In our opinion, this is enormous progress, especially if we look at the situation in other European countries.

Another result of the German experience in recent years is that any author of a significant academic work (e.g. doctoral theses, dissertations, etc.) is generally obliged to include a simple declaration of authorship, assuring that the work submitted is exclusively his and that all the external assistance used is listed therein (see Figure 4). Therefore, in the event of plagiarism or any other ethically unacceptable event being subsequently detected, the university could proceed to instigate a disciplinary motion for intent to deceive, and could even strip the author of the academic title he obtained.

To conclude, we believe it is appropriate to cite another series of repercussions in Germany after the
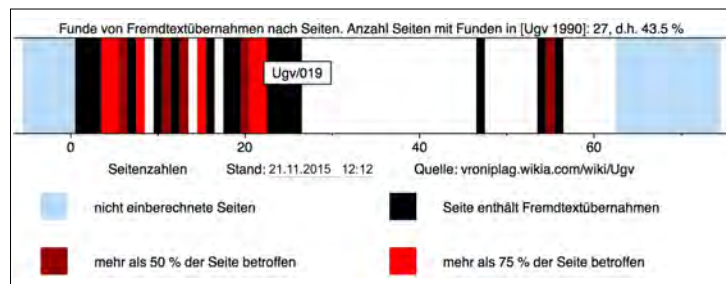
Figure 3: Barcode resulting from the investigation into plagiarism in the doctoral thesis of Ursula von der Leyen (http://goo.gl/LY2Zvh) (2015-11-21).
Title: Plagiarised passages of text according to page number. Total number of pages with plagiarised texts in Ursula Gertrud von der Leyen 1990: 27 (43.5%). **Date:** 2015/11/21, 12:12 am. **Source:** vroniplag.wikia.com/wiki/ugv.
Barcode colours: blue (pages not included in the calculations); black (page containing textual fragments of other sources); dark red (affects more than 50% of the page); light red (affects more than 75% of the page).

wave of plagiarism scandals started by the Guttenberg case in 2011, and that could serve as a reference for other countries.

Firstly, we must consider the overall use of antiplagiarism software to help facilitate the work of teachers in searching for fraudulent academic works (Mayer & Röhle, 2014). These programmes are perceived very positively by teachers, and as a mechanism to defend their own reputation, since the possible existence of presumed complicity between the supervisor and the author of the plagiarised academic work has often been suspected.

Secondly, proposals to change legislation are being drawn up in order that academic plagiarism be tackled in a specific way, including the introduction of a new research fraud offence (Wissenschaftsbetrug), making it compatible with new, more serious criteria (Goeckenjan, 2013; Linke, 2015).

Figure 4: Obligatory template of declaration of doctoral thesis authorship at the University of Ulm (https://goo.gl/yr6BQn) (2015-12-25). Translation: Declaration / I hereby declare that I have written the present thesis independently, without use of other resources than those indicated. I have marked passages included from other works, whether verbatim or in content, as such.

Some are also calling for the model of some North American universities to be followed by establishing different gradations in the case of plagiarism, with different penalties according to the quantity and quality of plagiarised fragments. Lastly, the use of very exhaustive reference websites aimed at teachers and students is encouraged, such as that of the University of California San Diego (http://goo.gl/Y7s0YW) (Weber-Wulff, 2014).

The influence of the German model on tackling reprehensible ethical conduct in the academic arena in Europe is evident. For example, in 2008 Austria created the Austrian Agency for Research Integrity with objectives and procedures inspired by the German Research Ombudsman (Föger, 2015; Mayer, 2015). However, Spain, like other European countries such as France, Italy and Portugal, still lacks these national institutions that have already been introduced in other Central European countries. In the case of Spain, only the CSIC (National Research Council) currently forms part of the European Network of Research Integrity Offices (http://goo.gl/5dioju) created in 2008 at the initiative of the United Kingdom (Löwer, 2015).

Notes

[1] All the translations of documents originally written in German, or of terms in that language, are from the authors.

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Antifraud Editorial Policy in Spanish and Latin American Scientific Publication: JCR Social Sciences Edition

La política editorial antifraude de las revistas científicas españolas e iberoamericanas del JCR en Ciencias Sociales

Dr. Alejandra Hernández-Ruiz is a Professor in the Communication and Social Psychology Department at the University of Alicante (Spain) (alejandra.hernandez@ua.es) (http://orcid.org/0000-0002-9719-6534)

ABSTRACT

The process of publishing scientific papers should be based on universal principles of professional conduct: credibility, truth and authenticity. In academia, the inclusion of policies on ethical standards in journal instructions to authors could prevent misconduct and fraud in scientific publication. Due to the lack of attention to research ethics in the Social Sciences, in particular in Spain and Latin America, this research aims to analyze the scientific misconduct policy of the Spanish and Latin American journals in the JCR-Social Sciences Edition (2014). To achieve our goal, 104 selected journal instructions to authors were examined in relation to the following ethical principles: (1) the rights of people involved in the research; (2) the welfare of animals used in research; (3) conflicts of interest; and (4) publication issues. Our results suggest that publication issues such as unpublished research and the ban on simultaneous submission are the most frequently cited ethical issues. In spite of the efforts made by policy-making bodies to establish misconduct guidelines, very few journals adhere to ICMJE and COPE recommendations. Given the ethical heterogeneity evinced by our study, and by previous studies, it seems that the development of a uniform code of ethics in the field of Social Sciences may be required.

RESUMEN

El proceso de publicación de un artículo debe basarse en la credibilidad, la verdad y la autenticidad. La inclusión de normas éticas en la política editorial científica se concibe como una medida preventiva y disuasoria de conductas inapropiadas. Dada la escasez de estudios sobre ética y publicación científica en Ciencias Sociales y, en particular, en España e Iberoamérica, esta investigación analiza la política editorial antifraude de las revistas españolas y latinoamericanas indexadas en el JCR en Ciencias Sociales (2014). Para cumplir nuestro objetivo, se utilizaron como muestra objeto de estudio 104 revistas y en las instrucciones a autores se examinaron una serie de principios de actuación ética: 1) Derechos de las personas que participan en la investigación; 2) Protección del bienestar de los animales objeto de experimentación; 3) Conflicto de interés; 4) Envío y publicación de manuscritos. Nuestros resultados apuntan que el carácter inédito de la investigación, así como la prohibición del envío simultáneo de los trabajos a otras revistas son los temas que aparecen con más frecuencia. Pese al intento de sociedades de edición científica como ICMJE y COPE por estandarizar los asuntos que afectan al fraude en la ciencia, su incidencia es exigua en las publicaciones objeto de estudio. Dada la dispersión normativa analizada, se retoma la necesidad detectada por otros autores de desarrollar un código ético uniforme para las disciplinas de Ciencias Sociales.

KEYWORDS | PALABRAS CLAVE

Ethics, scientific publication, instructions to authors, editorial policy, scientific fraud, Social Sciences, Spain, Latin America.
Ética, publicación científica, instrucciones a autores, política editorial, fraude científico, Ciencias Sociales, España, Iberoamérica.

1. Introduction

In the cycle of scientific research activity, the publication of results obtained marks the final step in the research process and may be described as an ethical duty (Baiget & Torres-Salinas, 2013). In this regard, as Avanzas, Bayes-Genis, Pérez, Sanchis and Heras (2011) have noted, the process by which a journal article is published ought to be framed in terms of credibility, truth and authenticity.

Publication in scientific journals contributes to the prestige and reputation of the paper's authors (Delgado, & Ruiz, 2009; Delgado, Torres-Salinas, & Roldán, 2007) and is a crucial factor in university promotion (Baiget & Torres-Salinas, 2013; Delgado & Ruiz, 2009). Scientific publications comprise the key indicator in the assessment of the research activity undertaken by university faculties (Campanario 2003, Giménez, 2015). As a result, the measurement of academic productivity in terms of the numbers of papers published (Beisiegel, 2010) and professional competition to ensure publication in the most highly-rated journals have prompted, in part, the emergence of such improper practices as plagiarism and the manipulation of data, among others (Delgado & Ruiz, 2009).

The need for transparency in both research development and public dissemination calls for the establishment of guidelines designed to orient authors as regards publication requirements (Tavares, 2011). Moreover, the detailed instructions issued to authors comprise an indicator of the information quality of the journal as a means of scientific communication (Delgado, Ruiz-Pérez, & Jiménez-Contreras, 2006) and play a key role in the promotion of scientific integrity (Pitak-Arnnop, & al., 2010).

The inclusion of ethical guidelines in the editorial policy of scientific publications as a measure to prevent or deter malpractice is especially noteworthy in this regard (Delgado & al., 2007; Bosch, Hernández, Pericas, Doti & Marušić, 2012). To this end, a number of scientific publishing associations in the field of biomedicine, such as the International Committee of Medical Journal Editors (ICMJE), the Committee on Publication Ethics (COPE), the Council of Science Editors (CSE) and the World Association of Medical Editors (WAME), have drafted guidelines of good practice to guarantee respect for a set of ethical standards in the publication process.

At the same time, as regards studies of ethics and scientific publication, two lines of inquiry may be discerned in relation to the analysis of editorial policy from the perspective of the promotion of ethical standards. The first line of inquiry focuses on the analysis of the perception and actions taken by editors as regards editorial policy designed to deal with scientific fraud.

The pioneering study by Brackbill and Hellegers (1980) noted an overwhelming consensus (77.3%) among the 138 editors of medical journals to refuse publication to papers containing ethical violations. Nevertheless, most of the journals (73.3%) did not envisage criteria of ethical action for authors (informed consent) or reviewers (58.7% of the journals did not require reviewers to factor ethical concerns into their assessment of submissions).

A more wide-ranging analysis of editorial policy regarding fraudulent practice in a multidisciplinary sample of 399 scientific journals (physics, engineering, biomedicine and the social sciences) disclosed that fewer than half of the publishers involved (47.7%) had established a formal policy designed to prevent such fraud; 28.9% had formulated protocols of actions to deal with malpractice; and only a very small proportion of the publications (15.7%) offered a definition of fraud as part of their editorial policy. Moreover, the correlation between impact as a variable and whether or not the journal has an anti-fraud editorial policy has proven to be significant (Resnik, Peddada & Brunson, 2009). In a subsequent study, Resnik, Patrone and Peddada (2010) broadened the scope of the sample analysed so as to check their preliminary results: only 41.4% of the 350 journals sampled had set out an anti-fraud editorial policy. Similarly, other studies such as Angelski, Fernández, Weijer and Gao (2012) show that a relatively low percentage of medical journal publishers (38%) include ethics as a concern in their instructions to reviewers.

With regard to the most worrying and prevalent ethical issues, a study of 231 journal publishers in the fields of medicine and the social sciences has shown that redundant publication is the most common and unsettling concern in this regard, albeit with low percentage scores (Wager, Fiack, Graf, Robinson, & Rowlands, 2009).

Little research has been carried out in Spain on the ethics of scientific publication, or on such editorial ethics in the field of the social sciences. No such research has been carried out in Latin America. A pioneering project in this regard, therefore, is Fonseca, Tur and Gutiérrez (2014), which focuses on the perception among 81 publishers of Spanish journals in the fields of psychology, education and communication in relation to a selection of cases of ethical malpractice. They conclude that inordinate self-citation, coercive citation, citation exchange and undeserved authorship

are the most common forms of improper practice. As regards the existence and visibility of ethical standards, 6.5% of publishers acknowledge that they have no such code; 78.9%, that they are implicit in their publishing rules and regulations; and 14.6%, that their ethical norms are set out explicitly in a specific section drafted for that purpose.

A second approach has prompted other researchers to explore anti-fraud editorial policy by analysing the instructions issued to scholars from scientific journals. The sample addressed by Atlas (2003) comprises 124 high-impact JCR (Science edition) journals, and the study shows that issues relating to manuscript submission (such as authorship and fragmented publication, among others) are raised in 87.2% of the instructions to authors analysed. However, other concerns relating to the rights of research participants or the welfare of laboratory animals, for instance, are articulated in only 48.8% and 32%, respectively.

In the field of biomedicine, Pitak-Arnnop & al. (2010) disclosed that only 8.3% of the 48 journals included in their study addressed all of the ethical requirements envisaged here. Furthermore, there is a significant correlation between journal impact as a factor and only two ethical principles: the protection of laboratory animals used for experimental purposes and data protection in the case of clinical trials.

Similarly, Bosch & al. (2012) studied the 399 highest-impact JCR journals in biomedicine, and their results show that only 35.1% offer an explicit definition of scientific fraud and that fewer than half (44.9%) have established protocols of action in relation to editorial malpractice. Significant differences were discerned as regards the correlation between journal impact as a factor and improper publishing practices. To a greater extent, therefore, the higher the impact, the more likely the journal is to identify such fraudulent practices as data fabrication and image manipulation. The correlation between adherence to the editorial and ethical standards of a scientific association and the implementation of policies and protocols of action in response to ethical concerns is likewise positive.

Given the impact of research on public healthcare,

most such ethical norms have been formulated and/or arose in the field of biomedicine, and thus most of the research into scientific ethics and publication also relates to that discipline (Bosch & al., 2012; Fonseca & al., 2014).

Therefore, in light of the lack of research into scientific ethics and publication in the field of the social sciences –especially in Spain and Latin America– the overall purpose of this paper is to explore the antifraud editorial policies framed by the Spanish and Latin American journals indexed in the JCR-Social Sciences

> Therefore, in light of the lack of research into scientific ethics and publication in the field of the social sciences –especially in Spain and Latin America– the overall purpose of this paper is to explore the antifraud editorial policies framed by the Spanish and Latin American journals indexed in the JCR-Social Sciences (2014 edition). The specific focus in this study is to trace whether or not there is a significant correlation between impact as a factor and the ethical principles envisaged.

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2. Materials and methods

This is a transverse descriptive study of a preliminary sample of 48 Spanish scientific journals and 59 Latin American journals in the field of the social sciences indexed in the Journal Citation Reports (JCR) Web of Science.

The Journal Citation Reports (JCR) Social Sciences database (2014 edition) comprises 3,154 titles across 57 disciplines. The Spanish and Latin American publications were identified by means of the «search by country» (Country/Territory) option. Spanish publications account for 1.5%, and Latin American publications for 1.9%, of the journals indexed in the JCR-Social Sciences (2014).

Of the initial sample of 48 Spanish journals, 46 (95.8%) include ethical criteria in their instructions to

authors; of the Latin American journals, 58 (98.1%) encompass such requirements (table 1). Thus, both the Revista de Historia Industrial and the Vial-Vigo International Journal of Applied Linguistics are excluded from the sample of Spanish journals; and the Chilean journal Estudios de Economía from the Latin American sample.

In August, September and October 2015, the instructions to authors were consulted on the websites for the 104 journals selected or via such resources as SciELO. Journal membership of ICMJE and COPE was confirmed via the associations' websites, www.icmje.org and www.publicationethics.org.

Table 1. Spanish and Latin American in JCR-Social Sciences (2014): study sample	
Country of publication	No. journals
Spain	46
Argentina	5
Brazil	18
Chile	13
Colombia	5
Mexico	15
Venezuela	2

The codification protocol was developed on the basis of the studies produced by Atlas (2003), Bosch & al. (2012), the ICMJE recommendations (2014), and the international standards for authors set out by COPE (2011). In line with the framework outlined by Bosch & al. (2012), the following information was recorded for each journal: subject category, impact factor for 2014 and editor.

Journal adherence to ethical recommendations issued by international and/or national organizations (scientific publication and other professional associations) was also explored. The authorship of antifraud editorial policies was likewise analysed. At the same time, as a preliminary approach to the analysis of ethical standards, whether or not the terms improper conduct and/or scientific fraud were defined was also taken into consideration.

Based on Atlas (2003) and the ICMJE (2014) and COPE (2011) standards, the instructions to authors in the 104 journals that comprise the sample were read in terms of the inclusion of principles of ethical action in relation to four broad issues:

1) In relation to the rights of people participating in the research project, the following matters are addressed, amongst others: whether or not subject anonymity or confidentiality ought to be safeguarded, if participation was based on informed consent, if the ethical principles relating to medical research involving human subjects (Declaration of Helsinki) have been

complied with, and if approval has been granted by the relevant ethics committee.

2) With regard to the protection of the welfare of animals used for the purposes of experimentation, the instructions were read to see if authors are required to fulfil ethical standards to ensure such protection of wellbeing, such as approval by the relevant ethics committee or fulfilment of established legislation on the matter.

3) Financial, work-related, personnel, research and/or moral conflicts of interest; note was taken also of whether or not authors are required to disclose the source(s) of funding for their research, which may bias the impartiality of research results.

4) Issues relating to the submission and publication of papers. The requirement that the research be original and unpublished (that is, excluding duplicate or redundant publication): to ensure that a paper that overlaps in substantial terms with a previous publication is not to be published without a clear and visible reference to the earlier paper (ICMJE, 2014). Fragmented publication ('salami slicing'): «the artificial fragmentation of the research into minimum publishable units» (Baiget & Torres-Salinas, 2013: 58). The fabrication and falsification of data: artificial fabrication of information produced without following the methodology set out in the manuscript; and falsification of the data obtained so as to ensure that the working hypotheses of the paper are confirmed (Baiget, 2010).

• Authorship requirements: only individuals who have contributed in a substantial way to the production of the manuscript ought to be listed as authors of the paper (Camargo, 2012; COPE, 2011; ICMJE, 2014). Undeserved and honorary authorship is addressed here: researchers who are included among the authors of the paper because of their reputation, influence or seniority (Camargo, 2012; COPE, 2010; Fonseca & al., 2014; Tur, Fonseca, & San-Miguel, 2013), or due to obsequiousness, a sense of obligation or fear of other members of the research group (Camargo, 2012). Other forms of undeserved authorship include guest authorship: authors who are invited to take some credit for the publication; and so-called 'gifted' authorship, authors who are included as a form of payment in kind or to return a personal favour (COPE, 2011). The phenomenon of ghost authorship is also explored: the exclusion from the list of authors of individuals whose work render them deserving of such inclusion (Avanzas & al., 2011; Camargo, 2012; COPE, 2011; Fonseca & al., 2014).

• Professional cooperation: Whether or not the researchers are required to share methods and data

that would enable other scientists to replicate the study is explored (Bebau & Davis, 1996).

An exploratory analysis of different variables has been carried out, and the parametric assumptions for the quantitative variable «impact factor» (IF) have been established; the descriptive statistics of central tendency and deviation have also been calculated.

The Mann-Whitney U test was selected to examine the link between IF and the ethical principles envisaged by the journals because of the degree of variable measurement it enables. The null hypothesis was rejected with a probability of $p<0.05$ and a statistical confidence level = 95.5. SPSS 22 was used to carry out the various statistical calculations.

3. Analysis and results

As regards subject area (table 2), in general, the three most common categories of journals included in the sample are Economics (9.5%), Linguistics (7.8%) and Public, Environmental and Occupational Health (7.8%). However, if all the journals relating to different areas of psychology are grouped together, they comprise a higher proportion of the total (13.9%). Thus, psychology is the most prevalent category in the Spanish and Latin American indexed in the JCR-Social Sciences (2014 edition) and selected for the purposes of this study.

In relation to the adherence of the 104 journals to ethical criteria defined by international bodies, 78 (75%) of the instructions to authors make no reference to any standard-setting organisation in this regard. A multiple response frequency analysis shows that of the other 26 jour-

nals (25%) –see table 3– 16 (47.1%) state that they meet the requirements established by the ICMJE, although only 4 of them have a presence on www.icmje.org. 12 journals (35.5%) assert their fulfilment of the COPE standards, and 4 have taken out formal membership at publicationethics.org. Nevertheless, although The European Journal of Psychology Applied to Legal Context (Spain) is part of the Elsevier group (COPE member), no mention is made of this fact in the instructions to authors. Such is the case also of the Latin American Economic Review (Mexico). To a lesser extent, publications opt to meet the ethical (not stylistic) demands of the American Psychological Association (APA), the Farmington Agreement (a protocol regulating the editorial process endorsed by a group of specialist journals with regard to the use of

Table 2. Spanish and Latin American journals by subject area: Study sample (n=104)			
Subject area	Responses		Percentage of cases
	No.	Percentage	
Anthropology	5	4.3%	4.8%
Business	4	3.4%	3.8%
Business and Finance	1	.9%	1.0%
Communication	1	.9%	1.0%
Demography	1	.9%	1.0%
Economics	11	9.5%	10.6%
Education and Educational Research	8	6.9%	7.7%
Ethics	1	.9%	1.0%
Geography	3	2.6%	2.9%
History	5	4.3%	4.8%
History and Philosophy of Science	1	.9%	1.0%
History of Social Sciences	1	.9%	1.0%
Information Science and Library Science	5	4.3%	4.8%
International Relations	1	.9%	1.0%
Law	3	2.6%	2.9%
Linguistics	9	7.8%	8.7%
Management	3	2.6%	2.9%
Nursing	3	2.6%	2.9%
Political Science	6	5.2%	5.8%
Psychiatry	4	3.4%	3.8%
Psychology, applied	1	.9%	1.0%
Psychology, clinical	5	4.3%	4.8%
Psychology, educational	1	.9%	1.0%
Psychology, experimental	1	.9%	1.0%
Psychology, multidisciplinary	8	6.9%	7.7%
Public Administration	2	1.7%	1.9%
Public, Environmental and Occupational Health	9	7.8%	8.7%
Social Sciences, biomedical	1	.9%	1.0%
Social Sciences, interdisciplinary	6	5.2%	5.8%
Sociology	4	3.4%	3.8%
Substance Abuse	1	.9%	1.0%
Urban Studies	1	.9%	1.0%
Total	116	100.0%	111.5%
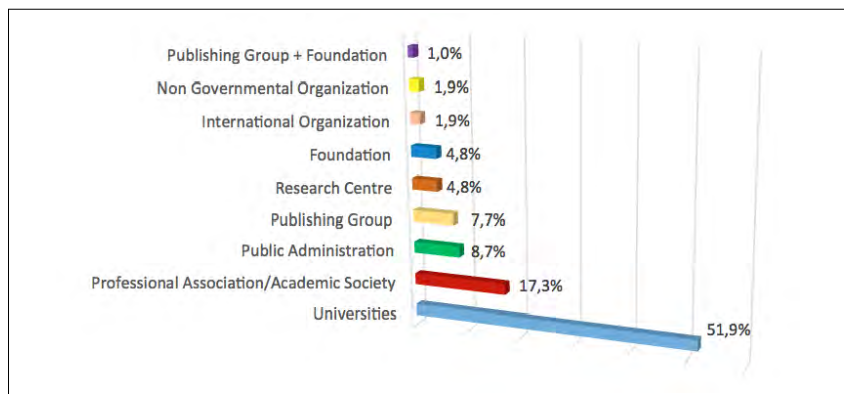
Graphic 1. Publishers of Spanish and Latin American journals included in study sample (n=104), by type.

psychoactive substances) and the indications of the Council of Science Editors (CSE). Journals in the field of biomedicine prove most likely to meet international standards. 20 of the 26 publications that follow such recommendations are related to the subject areas of psychiatry, psychology, nursing and public health.

Only four journals (3.5%) reference initiatives in this area at a national level. In the Spanish sub-sample, two journals refer to the Code of Best Practices issued by the CSIC (the Spanish National Research Council). In the Latin American context, two journals cite their adherence to the basic directives on ethics in scientific communication established by the Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq)[1] in Brazil; and one of them also acknowledges the Code of Best Practices defined by the Fundação de Amparo à Pesquisa do Estado in Sao Paulo[2].

As regards the authorship of antifraud editorial policies (Graphic 2), a very significant proportion (75 journals, 70.8%) were drafted by the journal itself; and 24 journals (22.6%) have implemented the recommendations made by international or national academic or scientific publication bodies.

As regards explicit reference to or definition of the term improper conduct and/or scientific fraud, 91 journals (87.5%) make no such reference and 102 (98.1%) do not define what might be understood as fraud in the context of science. Only the «Gaceta Sanitaria» journal offers a definition of fraud, which encompasses deliberate action, bad faith and an intent to deceive the readers. In all the other publications, the definition of malpractice is implied by the list of improper actions outlined.

28 (26.9%) of the 104 journals addressed here include rules relating to the protection of human subjects involved in the research process among the principles of ethical action articulated in the instructions to authors. 23 of the 28 journals relate to the fields of psychiatry, psychology, nursing and public health. In more specific terms, 15 of the 28 journals (53.6%) require the authors to prove that participants have given informed consent; 14 (50%), an acknowledgement that the relevant ethics committee has granted its approval; and 9 journals (32.1%) refer explicitly to the Declaration of Helsinki. 25% (7 publications) require the authors to respect the anonymity and confidentiality of research participants, and 17.9% (5 instances) insist that research involving human subjects meet all established ethical and professional standards. In broader terms, 10.7% (3 journals) demand that research be carried out in line with international agreements and legislation as regards human experimentation. Finally, 7.1% (2 journals) require authors to provide proof of consent in the case of studies that involve the use of chemical products or equipment that may pose a risk to personal health and safety.

The protection of animal welfare is acknowledged in 10 (9.6%) of the 104 publications in this study sample. 8 of the 10 publications belong to the fields of psychiatry, psychology and public health. Of these 10 publications, 30% (3 journals) require that research involving animals be carried out in line with ethical criteria and established professional codes in this regard. 20% (2 journals) require proof of consent in the case of studies involving animals that entail the use of chemical products or equipment that may pose a risk to health and safety; and the same number (2 journals: 20%), that the research be in line with the criteria established by a research association or body. Finally, one journal (10%) insists that the experimentation be in

Table 3. Adherence to international standards in journals included in study sample (n= 26)			
International standards	**Responses**		**Percentage of cases**
	No.	**Percentage**	
ICMJE	16	47.1%	61.5%
COPE	12	35.3%	42.3%
CSE	1	2.9%	3.8%
Farmington Agreement	1	2.9%	3.8%
APA	4	11.8%	15.4%
Total	34	100.0%	126.9%
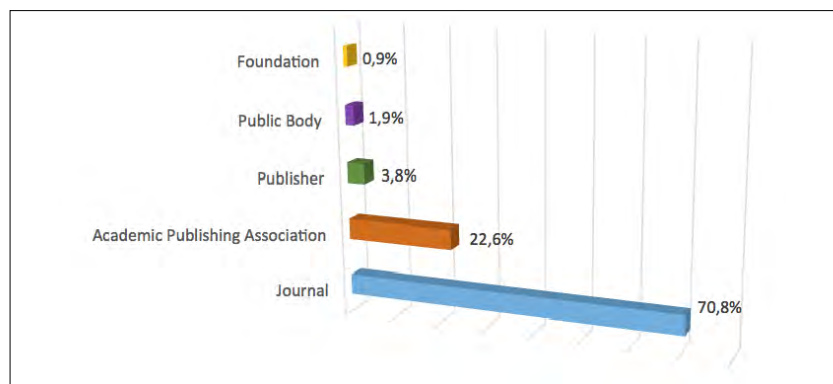
Graphic 2. Authorship of antifraud policies (n=104).

Thus, it may be concluded that there is a significant correlation between a given journal's impact factor (IF) and a number of the ethical principles addressed here: 1) the protection of the rights of research participants (U= 358; p=0.000; IC= 95.5); 2) the protection of animal welfare (U= 195.5; p=0.002; IC= 95.5); 3) conflict of interest (U=533.5; p=0.000; IC=95.5); 4) permissions required (U=650.5; p=0.001; IC=95.5); 5) authorship requirements (U=472; p=0.000; IC=95.5); 6) authorship contributions (U=228; p=0.008; IC=5.5); and 7) fragmented publication (U=149; p=0.043; IC=95.5). All of the analyses disclose that such ethical policies are more prevalent in journals with higher IF values, and that this correlation is statistically significant. No other significant differences are discerned in relation to the other ethical policies (p>0.05).

accord with the rules of a national animal welfare regulatory authority; and another (10%) requires in more general terms that the research follows the procedures stipulated by the relevant authorities.

In relation to conflicts of interest, 26 (25%) of the 104 instructions explored cite the need to acknowledge any real or potential conflict. Of these 26 instances, 16 publications (61.5%) refer to conflicts of interest on financial grounds, followed by conflicts based on personal or other forms of interest (10 journals: 38.5%), and commercial or working relationships in 8 cases (30.8%). 6 journals (23.1%) require the authors to disclose the source of their funding so as to avoid any possible conflict of interest. Finally, moral or ideological concerns are referenced as possible sources of conflicts of interest in two instances (7.7%).

With regard to the submission and publication of papers, Graphic 3 shows that the most common ethical criterion is that the manuscript be previously unpublished (86.5%). Second, in 83.7% of cases, authors are required to ensure that the paper to be reviewed has not been submitted simultaneously to other journals. Thirdly, 28.8% of the publications require the author(s) to show that they have necessary permissions to reproduce material that may be subject to copyright. And finally, 25% of the journals set out the requirements that authors must meet so as to be listed as such. References to the other ethical policies addressed in this study are incidental.

4. Discussion and conclusions

Given the significance of transparency and integrity in the editorial process for scientific credibility, this study aimed to offer an overview of the situation by exploring the ethical norms formulated in Spanish and Latin American journals indexed in the JCR-Social Sciences (2014 edition).

Despite the best efforts of scientific publishing associations such as ICMJE and COPE to standardise the issues that have a bearing on scientific fraud, their

Graphic 3. Submission and publication of papers: ethical policies (n=104).

effect on the publications included in this study sample would appear to be minimal. Although journals relating to biomedicine prove most likely to take such approaches on board, only one quarter of the publications addressed here follow the ethical recommendations made by the standard-setting body in their field. Hence the situation is one of wide normative variety, wherein a plurality of independent actors (journals) set out the instructions to be followed by authors. As both Bosch & al. (2012) and Resnik & al. (2009) have already shown, a very small percentage of journals offer an explicit definition of improper conduct and/or scientific fraud. In the sample explored here, only one Spanish journal «Gaceta Sanitaria» provided such a formulation.

The results obtained here suggest that the most common issues arising in relation to the submission and publication of papers in Spanish and Latin American journals are that the research be previously unpublished and that the paper not be simultaneously submitted to a number of journals.

On the other hand, although concerns regarding authorship are referred to by Spanish publishers from a number of related scientific fields as most frequently leading to cases of improper practice (Fonseca & al., 2014), only one quarter of the journals in the study sample (Spanish and Latin American) reference the matter.

Similarly, while data fabrication and falsification, along with plagiarism (and self-plagiarism), comprise the typical instances of fraudulent scientific practice (Bosch & al., 2012; Resnik & al., 2010), only a small number of the publications explored in this study address these phenomena.

At the same time, as Atlas (2003) averred, matters relating to the protection of people and the welfare of animals involved in research evince a similarly low profile. While it is true that animal experimentation is a feature of other fields of knowledge, the selection of human subjects to participate in social research is a common practice in the social sciences and merits further protection. In the same way, conflicts of interest are a key variable factor that may bias the objectivity of scientific results but only 20% of the journals analysed here address the issue.

In line with previous research (Bosch & al., 2012; Pitak-Arnnop & al., 2010), this study confirms the significant correlation between journal impact factor (IF) and a number of ethical principles: in general, the higher the IF, the more likely the publication is to insist on certain ethical criteria.

Despite the relatively low prevalence of the ethical principles under discussion here, the editorial policy implemented by Comunicar in Spain is worth highlighting in this regard: this journal has drafted a specific code of ethics that articulates a range of different norms for editors, reviewers and authors. Similarly, the journals published by the CSIC (the Spanish National Research Council) also use a Code of Best Practices for all stakeholders in the editorial process; and the Elsevier group has laid down public protocols for action in response to cases of malpractice.

A particularly noteworthy development in the Spanish context was the decision by the journal «Gaceta Sanitaria» to establish the role of Advocate, to deal with claims arising from any lack of impartiality in the editorial process and, amongst other issues, instances of ethical malpractice (García & Borrell, 2012).

Finally, the pressing need identified by Bosch & al. (2012) and Fonseca & al. (2014) remains: to set out a code of ethics for the field of social sciences that outlines standard procedures for editors, authors and reviewers. Indeed, the normative variety discerned in the sample addressed here suggests that there is also a real need to clarify the terminological confusion surrounding the term «original publication». In some cases, its meaning may connote a capacity for 'creativity' among the authors of a paper; in other cases, it is a synonym for «unpublished». Given the lack of a clear definition in this regard, only cases that evince a plausible understanding that the paper is unpublished have been taken into consideration for the purposes of this study. However, in the Latin American context, the journal «Salud Colectiva» (Argentina) provides a model of concision and precision in the distinction it draws between «original publication» and «unpublished publication». Later studies ought to analyse actual compliance with antifraud editorial policies, as well as the responses of reviewers and editors to the discovery of scientific malpractice.

Notes

[1] The basic norms of ethics in scientific communication from the Consejo Nacional de Desenvolvimento Científico e Tecnológico (CNPq) in Brasil (www.cnpq.br/web/guest/diretrizes).
[2] The Code of Best Scientific Practices from the Fundação de Amparo à Pesquisa do Estado de São Paulo (www.fapesp.br/boaspraticas).

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Chinese University EFL Teachers' Knowledge of and Stance on Plagiarism

Conocimientos y actitudes ante el plagio del profesorado de lengua inglesa en universidades chinas

Dr. Guangwei Hu is Associate Professor at the Nanyang Technological University (Singapore) (guangwei.hu@nie.edu.sg) (http://orcid.org/0000-0002-2297-4784)

Xiaoya Sun is Assistant Lecturer at the Xi'an International Studies University (China) (616985834@qq.com) (http://orcid.org/0000-0002-2538-4544)

ABSTRACT

Plagiarism has engendered increasing concern in academia in the past few decades. While previous studies have investigated student plagiarism from various perspectives, how plagiarism is understood and responded to by university teachers, especially those in English-as-a-foreign-language (EFL) writing contexts, has been under-researched. As academic insiders and educators of future academics, university teachers play a key role in educating students against plagiarism and upholding academic integrity. Their knowledge of and attitudes toward plagiarism not only have a crucial influence on their students' perceptions of plagiarism but can also provide insights into how institutions of higher education are tackling the problem. The study reported in this paper aims to address this imbalance in research on plagiarism by focusing on a sample of 108 teachers from 38 Chinese universities. Drawing on both quantitative and qualitative data that comprise textual judgments and writing samples, it examines whether EFL teachers in Chinese universities share Anglo-American conceptions of plagiarism, what stance they take on detected cases of plagiarism, and what factors may have influenced their perceptions. Findings from this study problematize the popular, yet over-simplistic, view that Chinese EFL writers are tolerant of plagiarism and point to academic and teaching experience as influences on their perceptions and attitudes concerning plagiarism.

RESUMEN

El plagio ha generado preocupaciones crecientes en el círculo académico en las últimas décadas. Aunque estudios anteriores han investigado el plagio del estudiante desde varias perspectivas, todavía hay poca investigación sobre cómo los profesores universitarios entienden el plagio y responden ante él, especialmente en contextos escritos en la enseñanza del inglés como lengua extranjera (EFL). Como expertos académicos y educadores de futuros académicos, los profesores universitarios desempeñan un papel clave en la formación de los estudiantes contra el plagio y en la defensa de la integridad académica. Sus conocimientos y actitudes con respecto al plagio no solo tienen una influencia crucial sobre las percepciones estudiantiles hacia el plagio, sino que también pueden proporcionar ideas sobre cómo las universidades resuelven el problema. El presente estudio pretende abordar este desequilibrio en la investigación sobre el plagio, centrándose en una muestra de 108 profesores de 38 universidades chinas. Basándose en datos cuantitativos y cualitativos obtenidos de juicios textuales y de redacciones, se examina: 1) si los docentes de EFL en universidades chinas comparten los conceptos angloamericanos del plagio; 2) qué postura tienen en los casos de plagio detectados; 3) qué factores pueden influir en sus comprensiones. Los resultados de este estudio problematizan la opinión popular y simplista de que los escritores chinos de inglés como lengua extranjera son indulgentes en cuanto al plagio, y señalan que las experiencias académicas y educativas tienen mucha influencia sobre sus percepciones y actitudes hacia el plagio.

KEYWORDS | PALABRAS CLAVE

Plagiarism, second language, Chinese universities, English language teachers, academic integrity, attitude, knowledge, academic socialization.
Plagio, segunda lengua, universidades chinas, docentes de inglés, integridad académica, actitud, conocimiento, socialización académica.

1. Introduction

Academic writing builds on the current knowledge base by incorporating words and ideas from existing work into new texts (Pecorari & Petric, 2014). This is a convention-governed process (Pecorari, 2008) in which a writer has to comply with established and shared disciplinary practices to steer clear of plagiarism accusations. In the past few decades, the advent of the Internet and the boom of various information and communication technologies have made an ever increasing wealth of sources readily available and easy to plagiarize (Hu & Lei, 2012). The incidence of plagiarism has been on the increase and engendered growing concern in academia.

To tackle the problem of plagiarism, it is necessary to look beyond the symptoms to the underlying causes (Macdonald & Carroll, 2006). In essence, all contributing factors to plagiarism boil down to a certain deficiency in the perpetrators, who may lack academic integrity, the willingness, the necessary knowledge or the language skills to use sources appropriately (Pecorari, 2008). For second language (L2) writers who have to navigate the writing conventions associated with a new language, the contributing factors can be more complex. The most widely discussed factor is culture-specific views of plagiarism. It is frequently suggested that cultures differ in their understanding and acceptance of plagiarism (Bloch & Chi, 1995; Pennycook, 1996; Sapp, 2002; Scollon, 1995; Shei, 2005; Sowden, 2005). For example, literacy practices such as memorization and imitation of model texts that are common in Confucian-heritage cultures are often cited to explain why Chinese students in particular and Asian students in general tend to hold different conceptions of plagiarism (Bloch & Chi, 1995; Maxwell, Curtis, & Vardanega, 2008). Other researchers (Liu, 2005; Pecorari, 2008; Rinnert & Kobayashi, 2005), however, maintain that difficulties faced by L2 writers are more likely a result of their inadequate language proficiency, which may cause them to feel unconfident about their own language use and hence overrely on source texts. Empirical studies on factors likely to influence understandings of and attitudes toward plagiarism have yielded contradictory findings, especially in terms of how enculturation in higher education may impact on knowledge of and stance on plagiarism (Chandrasegaran, 2000; Deckert, 1993; Lei & Hu, 2014; Sapp, 2002; Wheeler, 2009).

In Anglo-American academia, source documentation and attributed paraphrasing are considered two important strategies for avoiding plagiarism (Park, 2003)[1]. While the former is reasonably straightfor-

ward and can be done with adequate training, the latter entails high demands on subject knowledge and linguistic competence (Keck, 2010) and, as such, usually forms «a complex and often elusive experience for L2 writers» (Hirvela & Du, 2013: 87). Moreover, researchers and academic gatekeepers differ greatly in terms of their standards for sufficient paraphrasing. While some believe that to keep clear of plagiarism, there should be no traces in a paraphrase of verbatim copying of strings of even a few words from the original (Benos, Fabres, & Farmer, 2005; Roig, 2001; Shi, 2004), others adopt more lax standards by allowing the inclusion of more source text in a paraphrase (Keck, 2006; Pecorari, 2008). Empirical studies which examine paraphrasing practices in actual writing samples would provide a better understanding of what paraphrasing practices are considered acceptable by participants.

Considering the essential role that teachers can play in detecting and responding to student plagiarism and educating students against plagiarism, researchers have been directing increasing attention to teacher perceptions of plagiarism. Previous studies found that teachers differed among themselves as to what constitutes plagiarism (Borg, 2009; Flint, Clegg, & Macdonald, 2006; Pickard, 2006) and that many had little knowledge of institutional definitions of plagiarism and did not teach students about plagiarism effectively (Eriksson & Sullivan, 2008). In two of the very few such studies conducted in the Chinese context, Lei and Hu (2014; 2015) found that while most of the EFL teachers in their study could identify both unacknowledged copying and unattributed paraphrasing as plagiarism and/or held condemnatory attitudes toward detected plagiarism, their understandings of unattributed paraphrasing, which is considered a less clear-cut form of plagiarism than unacknowledged copying, appeared divergent and ambivalent. Apart from this, it remains largely unknown to what extent Chinese teachers' perceptions of plagiarism are different from or similar to those widely accepted in Anglo-American academia. This lack of research on Chinese teachers' understandings of plagiarism is surprising given the many studies done on Chinese learners in Anglophone and Chinese universities (Bloch & Chi, 1995; Deckert, 1993; Matalene, 1985; Pennycook, 1996; Sapp, 2002; Shi, 2004; Valentine, 2006).

To fill the gap in plagiarism research on Chinese teachers, we conducted a study on a sample of Chinese EFL teachers from multiple universities in mainland China to examine whether they shared Anglo-American standards abut plagiarism and what factors

may have influenced their knowledge of and stance on plagiarism. We aimed to gather empirical evidence that could deepen our understanding of plagiarism as an important discursive phenomenon and put cultural explanations of plagiarism to the test (Flowerdew & Li, 2007). Specifically, the following research questions were formulated to guide this study: How well do Chinese university English teachers understand plagiarism? What are their attitudes toward recognized plagiarism? What factors may influence their knowledge of and attitudes toward plagiarism?

2. Methodology
2.1. Participants

We adopted a combination of convenience and snowball sampling strategies for participant recruitment. We contacted our personal acquaintances who were English teachers in different Chinese universities, invited them to participate in the study, and asked for their assistance in recruiting colleagues who might be interested in participating in our study. Ultimately, 108 EFL teachers from 38 universities located in different regions of mainland China were involved. Table 1 summarizes the relevant demographic information on these participants. The sample ranged in age from 25 to 50 (M=34.33, SD=4.99) and comprised predominantly female teachers, reflecting the typical gender distributions of the female-dominated discipline in Chinese universities. It included both very experienced teachers and those new to the profession. The 107 participants who provided information about their length of teaching service had an average of 9.47 years of teaching experience (SD=5.39; range=1 to 27). A great majority of the participants held a Master's degree and were hired at the academic rank of lecturer. Slightly less than half of the participants had overseas academic experience, that is, studying in universities in Anglophone countries or in English-as-a-second-language (ESL) contexts such as Hong Kong and Singapore, where the Anglo-American notions of plagiarism are widely adopted.

2.2. Instruments

We used two instruments to collect data: the Plagiarism Knowledge Survey (PKS), and the Paraphrasing Practices Survey (PPS). Both instruments were adapted from Roig (2001). The PKS aimed to explore whether the participants would recognize insufficient paraphrasing as plagiarism, to ascertain the criteria they adopted for determination, and to investigate their attitudes (e.g., punitive or lenient) toward recognized cases of plagiarism. It consisted of an original two-sentence paragraph and six rewritten versions of this paragraph. The first four versions were incrementally but insufficiently paraphrased from the original and thus were instances of plagiarism, whereas the last two versions were adequately paraphrased and free of plagiarism. As reported by Roig (1997), four American professors independently validated the instrument and agreed with the plagiarism characterization of the six written versions. The participants in our study were asked to compare each rewritten version with the original paragraph, choose one of the three provided options «plagiarized, not plagiarized, or cannot determine, and then provide reasons for their judgment. In order to elicit participants' attitudes toward identified plagiarism, we added a rating scale of 0 to 10 points to the original PKS and asked them to rate each rewritten version according to the presence and gravity of plagiarism: the gravest case of plagiarism could be penalized by a zero, and a properly paraphrased paragraph might be awarded the highest score possible.

The PPS described a scenario in which participants had to paraphrase the following short paragraph from a journal article about astrology (Roig, 2001): «If you have ever had your astrological chart done, you may have been impressed with its seeming accuracy. Careful reading shows many such charts to be made up of mostly flattering traits. Naturally, when your personality is described in desirable terms, it is hard to deny that the description has the «ring of truth» (Coon, 1995: 29).

The instrument generated authentic writing samples by asking the participants to paraphrase the paragraph in a way that they believed would not constitute plagiarism. The participants were also required to fill out a personal information sheet which asked about their gender, age, educational background, teaching experience, number of academic publications, as well as the types of students and courses that they usually taught. Information on such variables was gathered because previous studies (Hu & Lei, 2012; Lei & Hu,

Table 1. Demographic Profile of Participants (N=108)										
Gender		Highest degree			Academic rank				Overseas experience	
Male	Female	BA	MA	PhD	AL	L	AP	FP	Yes	No
27	81	5	90	13	12	78	15	3	50	58
25%	75%	5%	83%	12%	11%	72%	14%	3%	46%	54%

Note. AL=Assistant lecturer; L=Lecturer; AP=Associate professor; FP=Full professor.

2014, 2015) suggested that they could have an impact on the participants' knowledge of and stance on plagiarism as well as their paraphrasing practices.

2.3. Data coding and analysis

The PKS generated two sets of scores: the plagiarism knowledge scores (hereafter knowledge scores), and the plagiarism stance scores (hereafter stance scores). Knowledge scores were calculated following Roig (2001). For each participant, one point was given for each rewritten version that was correctly identified, two points for each rewritten version that was not identified (including both choices of «cannot determine» and cases where a participant failed to give any judgment), and three points for each version incorrectly identified. A participant who correctly identified all six rewritten versions would obtain a perfect score of 6, whereas one who misjudged all six cases would get 18 points. Thus, lower scores would indicate greater knowledge of plagiarism and paraphrasing. Stance scores were derived by calculating the mean of the ratings given by each participant to the rewritten paragraphs that s/he identified as plagiarized (regardless of whether the paragraph was designed as a case of plagiarism or proper paraphrasing). The higher a stance score, the more lenient the participant was toward recognized plagiarism. The knowledge and stance scores thus obtained were analyzed with SPSS (version 23.0) to obtain descriptive and inferential statistics needed for answering our research questions.

The PKS also generated qualitative data in the form of the participants' written justifications for their judgments and ratings of the rewritten versions. The second author read these justifications repeatedly and analyzed them iteratively to identify the factors that the participants took into consideration when judging and rating the rewritten paragraphs. A coding scheme based on this analysis was then developed and used to capture the criteria the participants adopted to evaluate the rewritten versions. To ensure the reliability of the coding, a graduate student used the coding scheme to code a randomly selected subset of the data independently, and the inter-coder agreement was 100%.

The coding of the PPS data was conducted by the second author and consisted in identifying strings of three or more consecutive

words in the paraphrases that were appropriated from the original paragraph. Because the coding did not involve subjective judgments, a second coder was not involved.

3. Findings
3.1. Results from the PKS

The participants' knowledge scores were analyzed both descriptively and inferentially. The range, mean, and mode of the knowledge scores were calculated to gauge the extent to which the Chinese teachers as a group accurately identified cases of plagiarism. The mean knowledge score was 7.51 (SD= 1.488; range=6-12), indicating that the 108 participants were able to correctly identify most of the rewritten paragraphs. Notably, as many as 43 teachers (approximately 40%) had the perfect score of 6, attesting to a satisfactory knowledge of plagiarism and proper paraphrasing. To show how accurately the participants identified each rewritten version, the percentage of responses to each response category (i.e., «plagiarized, not plagiarized, cannot determine») for each rewritten version was calculated, and the results are summarized in table 2. Notably, none of the rewritten versions was judged with perfect consensus. For the first four rewritten versions, as the extent of reformulation increased, the percentages of correct identifications dropped, whereas the percentages of misidentifications and choices of the «cannot determine» category increased correspondingly. This pattern clearly indicated that difficulty in identifying plagiarism increased with the extent of change made to the original text; it also suggested the existence of different criteria for plagiarism and proper paraphrasing even among teachers from the same discipline.

Of the 108 participants, 102 provided written justifications for their judgments regarding the rewritten versions. An analysis of these justifications revealed that they used three criteria when evaluating the paragraphs. First, many participants based their judgments on the extent to which the original paragraph was changed. About 65% of the participants pointed out that to avoid accusations of plagiarism, one needs to rewrite the original to change its diction and/or structure, as illustrated by the following representative justifications:

• The rewritten paragraph is

Table 2. Responses to the PKS by Type of Judgment and Rewritten Paragraph (N=108)						
Paragraph	Plagiarized		Not plagiarized		Cannot determine	
	n	%	n	%	n	%
1	103	95	4	4	1	1
2	103	95	3	3	2	2
3	96	89	5	5	7	6
4	64	59	24	22	20	19
5[a]	6	5	95	88	7	7
6[a]	13	12	85	79	10	9

Note. [a]Rewritten versions that were not plagiarized.

thoroughly paraphrased, i.e., the student uses all his own words as well as restructures the sentences to express the idea of the original paragraph (Rewritten version 5).

• [This is plagiarism] because the same or similar sentence structures are applied (Rewritten version 2).

• Changing the order of the original sentences without paraphrasing is definitely plagiarism (Rewritten version 1).

A second criterion used by the participants concerned the correct format of citation. Although the PKS instructions asked the participants to assume the inclusion of a proper citation for each rewritten version, many participants still emphasized the importance of acknowledging the source in the correct format, as can be seen in the following quotations:

• This version suggests clearly that it is the research result of another researcher. But it does not say whose idea it is and where it comes from (Rewritten version 4).

• The author points out the source of the finding and paraphrases it in his own words. It will be better if the researcher's name is clearly mentioned (Rewritten version 5).

• In academic writing, it stipulates that you need to state overtly whose ideas you are discussing (Rewritten version 5).

Still another consideration the participants had was whether certain words or expressions were used to indicate that the writer was reporting another person's ideas, as the following quotations illustrate:

• This is not P, since the writer uses many words to indicate that this is quoted from another researcher (Rewritten version 5).

• The writer used «according to one researcher» to indicate that he is retelling someone's research results (Rewritten version 4).

A 3-way ANOVA was run to assess the potential impact of teaching experience, overseas academic experience, and educational attainment on the knowledge scores. The participants were divided into three groups according to their years of teaching (1-7, 8-14, 15+) and two groups according to their highest degrees (BA/MA, PhD). The one case with missing value on teaching experience was deleted, leaving 107 cases for the analysis.

The analysis found that the knowledge scores were not influenced by teaching experience, $F(3, 107)=.089$, $p=.966$, $\eta_p^2=.003$, overseas academic experience, $F(1, 107)=.564$, $p=.454$, $\eta_p^2=.006$, or educational attainment, $F(1, 107)=.147$, $p=.702$, $\eta_p^2=.002$. There was no significant interaction bet-

ween teaching experience and educational attainment, $F(2, 107)=.450$, $p=.639$, $\eta_p^2=.009$, between teaching experience and overseas academic experience, $F(2, 107)=.882$, $p=.417$, $\eta_p^2=.018$, between educational attainment and overseas academic experience, $F(1, 107)=.018$, $p=.892$, $\eta_p^2=.000$, or among the three variables, $F(1, 107)=.731$, $p=.398$, $\eta_p^2=.008$. The effect sizes indicated that none of the independent variables or the interactions reached the criterial value suggested by Cohen (1988) for a small effect (i.e., $\eta_p^2=.02$).

The range, mean, and mode of the stance scores were obtained as measures of how the teachers as a group reacted to identified instances of plagiarism. The 108 respondents had a mean stance score of 1.73 (range=0-5.17), which indicated their overall punitive attitudes toward what they perceived to be plagiarism. Approximately 14% of the participants believed that no score should be awarded to a plagiarized text, and another 67.6% gave an average rating of less than 2 points. These results were consistent with an understanding of plagiarism as an act of stealing, as revealed in the following quotations:

• The first sentence is stolen from the original (Rewritten version 6).

• This one has made it clear enough this is a research finding of others but this cannot justify the act of «stealing» most [of] the sentences from the original paragraph (Rewritten version 4).

• The rewriter paraphrased the original statement through intentionally reversing the order of the sentences, without giving any credit to the author through citation. It is the steal of both language and ideas (Rewritten version 1).

A 3-way ANOVA was run to determine possible influences on the stance scores, with the three independent variables being teaching experience, overseas academic experience, and plagiarism knowledge. The participants were divided into three groups according to their knowledge scores (6 points, 7-9 points, and 10+). The ANOVA found that the stance scores were influenced by teaching experience, $F(3, 107)=3.306$, $p=.024$, $\eta_p^2=.099$, but were not affected by overseas academic experience, $F(1, 107)=3.245$, $p=.075$, $\eta_p^2=.035$, or plagiarism knowledge, $F(2, 107)=.343$, $p=.710$, $\eta_p^2=.008$. The direction of the relation between teaching experience and the stance scores indicated that as teaching experience increased, the stance scores increased accordingly. In other words, the longer time a participant spent on tertiary teaching, the more lenient s/he would become toward plagiarism.

3.2. Results from the PPS

The PPS elicited paraphrases of the original paragraph from 96 of the 108 participants. Fifty-seven (59.38%) of them did not appropriate any strings of 3 or more words from the original. Thirty-nine (40.62%) produced paraphrases containing 3 or more consecutive words copied verbatim from the original. Table 3 presents the percentages of participants who copied word strings of different lengths. Most verbatim copying involved strings of 3 or 4 words, but 3 paraphrases appropriated unusually long word strings.

To find out what factors might influence the participants' textual appropriation practices, the 96 teachers who completed the PPS were divided into two groups: those who did not appropriate any string of three or more words and those who did. Five 2-way Chi square tests were run to determine if there was any significant association between engagement in verbatim copying and teaching experience, educational attainment, overseas academic experience, plagiarism knowledge, and plagiarism stance, respectively. Participant groupings according to the four variables other than plagiarism stance followed the procedures described earlier. The grouping for plagiarism stance was done by putting those who gave average scores from 0 to 2 points, from above 2 to 4 points, and above 4 points into three separate groups. Four of the Chi square tests found no significant relationship: between teaching experience and textual appropriation practice, X^2 (2, N= 96)= .732, p=.694; between educational attainment and textual appropriation practice, X^2 (1, N= 96)=.029, p=.864; between plagiarism knowledge and textual appropriation practice, X^2 (2, N=96)= 2.389, p= .303; and between plagiarism stance and textual appropriation practice, X^2 (2, N=96)= 2.168, p= .338. A significant association was found between overseas academic experience and textual appropriation practice, X^2 (1, N=96)=5.597, p= .018. These results indicated that those teachers who had studied in overseas universities were less likely to incorporate word strings from the original text.

4. Discussion and conclusions
4.1. Chinese university English teachers' knowledge of plagiarism

Both the quantitative and qualitative results suggested that as a whole, the Chinese university EFL teachers in this study tended to understand plagiarism in a manner similar to that prevalent in Anglo-American academia. The knowledge scores yielded by the PKS

showed that the participants as a group were able to correctly distinguish the plagiarized texts from correctly paraphrased ones. As demonstrated by the justifications given for their textual judgments, they considered plagiarism not only according to the extent to which the original text was changed, but also in terms of textual ownership and source attribution – perceptions closely associated with Anglo-American conceptions of plagiarism (Marshall & Garry, 2006; Pennycook, 1996; Scollon, 1995; Shi, 2004). The writing samples collected with the PPS further indicated that the great majority of the Chinese teachers paraphrased the given paragraph quite sufficiently, perhaps even more thoroughly than the American psychology professors in Roig (2001). With the exception of a few cases, the teachers had both the awareness and ability to sufficiently modify the original paragraph to avoid plagiarism.

Taken together, our results contradict the findings of some previous studies that Chinese culture is more accepting of plagiarism and that Chinese writers do

Table 3. Verbatim Copying of Word Strings					
	String length (words)				
	3	4	5	6	7+
No. of participants	24	11	5	4	5
Percentage	25%	12%	5%	4%	5%

not acknowledge sources explicitly (Bloch & Chi, 1995; Sapp, 2002; Shei, 2005). A plausible explanation of the contradictory findings lies in Flowerdew and Li's (2007) observations that understandings of plagiarism in non-Anglo-American contexts are increasingly influenced by those in Anglo-American academia and that although the concept of plagiarism does not have a historical and ideological origin in China, perceptions of plagiarism should not be seen as culturally conditioned but constantly evolving as circumstances change (Lei & Hu, 2014). The growing penetration of Anglo-American ideas of plagiarism seems inevitable as long as English remains the academic lingua franca and Anglo-American dominance of the international academic community continues. Thus, the Chinese academic community is increasingly compelled to adapt its values and textual practices to face and navigate the Anglo-American dominance in order to participate in knowledge production in English-medium international journals.

4.2. Chinese university English teachers' attitudes toward plagiarism

As reported in a previous section, the PKS data yielded a mean stance score of 1.73 on a scale of 0-10

points for recognized plagiarism, indicating clearly punitive attitudes held by the teachers toward what they perceived to be transgressive intertextuality. A sizeable number of teachers (n=15) took a zero tolerance approach by awarding no points to any paragraph they regarded as plagiarized. Such a harsh stance was not surprising in view of the teachers' conception of plagiarism as a moral transgression, that is, an act of «stealing». It also showed that these teachers found plagiarism punishable and punished the perpetrators by marking them down. These results corroborate several recent studies (Hu & Lei, 2012; Lei & Hu, 2014, 2015) which reported a generally punitive attitude held by Chinese teachers and students toward perceived plagiarism, but contradict the conclusion of a number of earlier studies (Bloch & Chi, 1995; Deckert, 1993; Matalene, 1985; Pennycook, 1996; Sapp, 2002) which found Chinese students tolerant of and likely to engage in plagiaristic behaviors.

There are several plausible explanations of the contradictory findings. First, because the second group of studies mentioned above focused on Chinese students, it was possible that our teacher participants had a stronger sense of academic integrity and hence a greater obligation for ethical behaviors. Second, the EFL teachers in our study were likely to be much more knowledgeable about plagiarism as a result of their professional work than the students involved in the previous studies and, consequently, were able to recognize most instances of plagiarism. Third, it would be also reasonable to expect the university EFL teachers in our study to have stronger linguistic competence in English, when compared with the students in the previous studies, and therefore be able to use a greater variety of strategies for avoiding plagiarism (e.g., summarizing or paraphrasing a source thoroughly with appropriate attribution). In any case, our findings constitute new counterevidence against over-simplistic claims about Chinese writers being culturally more accepting of plagiarism (Sapp, 2002; Sowden, 2005).

4.3. Factors influencing Chinese university English teachers' knowledge of and attitudes toward plagiarism

Unexpectedly, teaching experience was found to have a negative effect on teacher stance on plagiarism in this study. In other words, the longer a teacher worked at university, the more lenient s/he was toward plagiarism. Two explanations are possible. It was likely for some teachers to relax their moral stance on plagiarism over years of teaching service, perhaps, as a result of having seen too many cases of student plagia-

rism, having been frustrated by going through all the trouble of navigating red tape when dealing with student plagiarism, or having been resigned to the futility of individual efforts to stem student plagiarism. Another possibility is that teachers with longer years of teaching service were older, had had less exposure to Anglo-American conceptions of plagiarism when they were in graduate and teacher education programs and, as a result, understood plagiarism differently from their younger counterparts. Given the nature of our data, it was impossible to tell which explanation was valid. If the first explanation was closer to the reality, our finding revealed a truly disconcerting tendency. If the second explanation captured the truth, our finding pointed to a need to re-educate the educators regularly so as to update their understandings of plagiarism, strengthen their condemnatory attitudes toward plagiarism, and ensure consistent treatment of student plagiarism (Pecorari & Shaw, 2012).

Overseas academic experience was also found to be an influence on the teachers' textual appropriation practice. That is, those teachers with overseas academic experience were less likely to copy strings of words verbatim from the original text in their paraphrases. This result was consistent with the findings of several studies (Deckert, 1993; Gu & Brooks, 2008; Song-Turner, 2008) which found a notable enculturational effect on the understandings of Anglo-American notions of plagiarism developed by Asian/Chinese students studying in ESL contexts, particularly those being immersed in Anglo-American settings. In our study, more than half of the teachers with overseas academic experience studied in a 1-year postgraduate program in Singapore. The program briefed new students about academic integrity at the program orientation, required them to sign the university's code of academic conduct, included a range of extended written assignments which must be submitted through Turnitin for plagiarism checking, and had a course focused specifically on norms and conventions of English academic writing. Lecturers in the program emphasized the importance of avoiding plagiarism and taught the students how to reference and appropriate sources in academic writing. With such extensive socialization against plagiarism, it was not surprising that the overseas-trained teachers were more capable of paraphrasing the original paragraph in a plagiarism-free manner.

4.4. Limitations and recommendations

Given the huge population of EFL teachers in China and the nature of plagiarism as «a complex pro-

blem about student learning, compounded by a lack of clarity about the concept of plagiarism, and a lack of clear policy and pedagogy surrounding the issue» (Angelil-Carter, 2000: 2), this study only gives a glimpse into the issues discussed, and its findings are by no means conclusive. Further research is needed to develop a more robust and contextualized understanding of how plagiarism is understood and dealt with in Chinese higher education. To facilitate this research, we offer several recommendations regarding sampling and data collection.

Future research can adopt more systematic sampling strategies to recruit participants who work in universities of different types and prestige, and teach different types of students (e.g., English-language majors vs. non-majors; undergraduates vs. postgraduates) and courses (writing vs. non-writing). More detailed inclusion criteria would not only contribute to the representativeness of the sample but also facilitate comparisons between participants with different backgrounds. Future studies can also sample teachers from a range of disciplines so that disciplinary differences in relation to perceptions and practices of plagiarism can be investigated. In addition, not only teachers but also students and institutional administrators can be involved in the same investigation to explore plagiarism from different viewpoints and develop a multi-faceted picture.

As for data collection, it would be worthwhile to explore if adjustments to our instruments and their administration may have any influence on participants' responses. For one thing, the instructions in the two instruments, especially the PKS, added several lines and might have caused extra burdens to some participants in an already demanding task. These instructions could be simplified or translated into Chinese so as to ensure better comprehensibility. For another, the PKS was placed before the PPS in the package of questionnaires sent out for the present study, and most participants presumably followed this order while completing the questionnaires. Undertaking the PKS (i.e., reading and judging the legitimacy of several rewritten versions of the same original paragraph) first might have alerted some participants to the importance of thoroughly paraphrasing an original text and caused them to make extra efforts in the subsequent PPS to keep clear of unacceptable paraphrasing practices. Future studies can explore whether reversing the order of the PKS and the PPS will generate writing samples exhibiting different textual appropriation practices. Large-scale investigations into institutional regulations on plagiarism, like those reported in Sutherland-

Smith (2011) and Yamada (2003), can also be conducted to collect comprehensive and in-depth data on how Chinese universities are tackling the challenges posed by plagiarism.

Notes

[1] For example, a quotation is expected in Anglo-American writing conventions to be attributed to the original author regardless of how familiar the quotation or the author is to the intended readership. However, such attribution is considered unnecessary and even condescending to a knowledgeable readership by many a Chinese writer (Bloch & Chi, 1995).

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The Impact of Activity Design in Internet Plagiarism in Higher Education

El impacto del diseño de actividades en el plagio de Internet en educación superior

ID María Gómez-Espinosa is Lecturer at International University of La Rioja (UNIR) (Spain)
(maria.gomez@unir.net) (http://orcid.org/0000-0003-1773-4468)

ID Dr. Virginia Francisco is Associate Professor at Complutense University of Madrid (Spain) (virginia@fdi.ucm.es)
(http://orcid.org/0000-0002-4492-5633)

ID Dr. Pablo Moreno-Ger is Associate Professor at Complutense University of Madrid (Spain)
(pablom@fdi.ucm.es) (http://orcid.org/0000-0003-4817-8150)

ABSTRACT

In this work we aim to gain a better understanding of the nature of plagiarism in Higher Education. We analyse a set of different activities in an online university-level course, aiming to understand which tasks lead more naturally to plagiarism. This analysis concludes that the activities that have a lower rate of plagiarism are activities that encourage involvement, originality and creativity. Subsequently, we reformulate the task that presented the highest rate of plagiarism, taking into account the conclusions of the previous analysis and trying to maintain their relative effort and educational impact. We then compare the newly designed activities with their original counterparts to measure whether there is a significant reduction in plagiarism. The results are clear and show a significant drop in the percentages of plagiarism. In addition, we performed an additional validation to ensure that both groups were, in fact, comparable. We found that both groups displayed similar plagiarism attitudes in other exercises that were not reformulated. This study shows that it is possible to reduce the incidence of plagiarism by designing activities in such a way that prompts students to propose their own ideas using information available on the Internet as a vehicle for their solutions rather than as solutions in themselves.

RESUMEN

El objetivo de este trabajo es comprender mejor la naturaleza del plagio en la Educación Superior. Analizamos una serie de actividades en un curso on-line de nivel universitario, con el objetivo de encontrar qué tareas llevan más naturalmente al plagio. Este análisis concluye que las actividades que tienen una menor tasa de plagio son actividades que fomentan la participación, la originalidad y la creatividad. Posteriormente, reformulamos la tarea que presenta la mayor tasa de plagio, teniendo en cuenta las conclusiones del análisis anterior y tratando de mantener su esfuerzo relativo y el impacto educativo. A continuación, comparamos las actividades del nuevo diseño con las originales para medir si el rediseño conlleva una reducción significativa del plagio. Los resultados son claros y muestran una caída significativa en los porcentajes de plagio. Además, se realizó una validación adicional en la que se analizó la actividad con la segunda tasa de plagio más alta, encontrando que los grupos eran comparables y mostraban actitudes de plagio similares en otros ejercicios que no habían sido rediseñados. Este estudio muestra que es posible reducir la incidencia de plagio mediante el diseño de actividades de tal manera que los estudiantes se sientan motivados para proponer sus propias ideas utilizando la información disponible en Internet como vehículo para sus soluciones en lugar de como soluciones en sí mismas.

KEYWORDS | PALABRAS CLAVE

Plagiarism, online education, ciberplagiarism, activity design, student perception, motivation, anti-plagiarism, academic ethics.
Plagio, educación on-line, ciberplagiarismo, diseño de actividades, percepción estudiantil, motivación, anti-plagio, ética académica.

1. Introduction

Academic plagiarism is, unfortunately, a common and widespread issue at all levels. Beyond the most typical cases from young students, it is easy to find high-profile examples of plagiarism reported even in mainstream media. In recent years we have witnessed the resignation of two German ministers accused of plagiarizing in their doctoral theses (Eddy, 2013). And while the problem is not new, the revolution in how we search and process content brought by the Internet has increased the challenge in educational settings. Students are prompted to produce and deliver exercises, essays or solutions to problem statements, and find all this information just a few clicks away (Atkins & Nelson, 2001; DeVoss & Rosatti, 2002; Moore, 2007). In this work we aim to gain a better understanding of the nature of plagiarism, especially in those cases where it is not due to an excessively complicated task.

1.1. Plagiarism in Higher Education

The Internet has entered all aspects of our daily life, including university classrooms, and a new way of approaching assignments has emerged. Many students seek the fastest possible solution to classroom assignments, regardless of the validity of the sources or respect to the work of others, a phenomenon that is widespread across all educational levels (Sureda, Comas, & Oliver, 2015). In this case, our focus is on Higher Education, where the growth of plagiarism has been an ongoing concern over the past few years (Culwin & Lancaster, 2001; Hart & Friesner, 2004; Clegg & Flint, 2006; Ellery, 2008; Eret & Gokmenoglu, 2010; Bretag, 2013; Heckler & Forde, 2015), and in which teachers are increasingly worried about the frequency and apparent lack of awareness of its moral implications by students (Perry, 2010).

The results of a survey conducted by the companies Six Degrés (2008) and Le Sphinx Développement showed some significant behaviors of students and teachers, identifying the Internet as the main source of documentation (90%) and with 43% of the students reporting that never or seldom cited their sources. These results were consistent with another experiment administred to 1,025 students (Comas, Sureda & Oliver, 2011) which states that 7 out of 10 university students admitted to copy texts or fragments of texts for the development of their academic activities, presenting them as their own.

Other studies conducted in different environments show widespread use of unethical practices, but introduce nuances. The University of La Rioja (Spain) in 2011-12 conducted an empirical experiment analysing 104 assignments from a university-level degree in Business Management. The students had to submit different assignments during the course, as well as a high-stakes final essay. Among the documents submitted, 13 of them (12.5%) displayed a plagiarism rate higher than 40%, a figure far beyond what could be considered academically reasonable. Remarkably, the higher the stakes in the activity, the lower percentage of plagiarism was found, suggesting an interesting link between the perceived importance of the task and the tendency to plagiarize (Gómez, Vargas, & Salazar, 2012). Regarding the attitude of the students towards plagiarism, a recent study by Newton (2015) pointed out that students considered that «academic misconduct should be modestly penalised», and only developed stricter attitudes after graduation.

Regarding the factors that invite students to plagiarise, even before the Internet was available, Ashworth, Bannister and Thorne (1997) identified four key issues: 1) The lack of awareness by the students concerning whether they are doing plagiarism or not; 2) The low probability of being detected; 3) the pressure on the level of demand and the deadlines established for the works; 4) The actual wording of the activities provided by teachers. These factors are still relevant: A more recent study by Eret & Ok (2014) observed that the tendency to plagiarize is, in fact, increasing with the spread of the Internet, and pinpointed as main reasons for plagiarism time constraints, excessive workloads and high difficulty of the proposed assignments.

These results are consistent in terms of reasons for plagiarism with the findings from Chen & Chou (2014) in a local study focusing on Taiwanese students. Another recent study from Hussein, Rusdi, & Mohamad (2016) found that students were widely aware of what plagiarism is, and that it is inappropriate. However, this would not deter students from plagiarizing for the other reasons mentioned. A more directed study from Kauffman & Young (2015) looked into how the ease of access to copy&paste tools and the presentation of the tasks influenced attitudes towards plagiarism.

In summary, most studies coincide in the interpretation that access to information has become so immediate that it is perceived by some as a «common knowledge» available for everyone to reproduce (Walker, 2010). These widespread issues have led to an academic/technological response seeking new ways and tools to detect plagiarism, as outlined in the next section.

1.2. Plagiarism detection tools

Many institutions approach the problem of plagiarism from the use of different methods to detect infringements. Such methods may range from the very simple (e.g. reverse-searching on Google, or any other general search engine) to the use of complex tools that perform more thorough checks.

Some tools automate the process of reverse-checking. Two of the most commonly cited tools in this category would be Plagiarism Checker (http://goo.gl/kEIH) and Article Checker (http://goo.gl/GgYtQ). Also in this category are CopioNIC (https://goo.gl/KQL9Ru), a free web application (requiring registration), that allows uploading files for search and Magister by Compilatio.net (https://goo.gl/FqnPHb) that allows both students and staff to upload documents and check their results online.

On the other hand, there are also products that create their own databases in which teachers can find the most interesting resources. Two examples could be Viper Plagiarism (http://goo.gl/TrBey) and Turnitin (http://goo.gl/ixhp9). The latter is one of the most widely used resources in the academic world, and compares new works with a large database of academic and web content, and its dominant position could grow to their recent merger with Ephorus (https://goo.gl/PifnGN), which is also present in many Higher Education Institutions. These tools are competing with other systems such as CrossCheck (http://goo.gl/DFB0vQ), which was originally created for scholarly articles, but is becoming another reference tool also for plagiarism detection in educational settings.

This thriving marketplace of plagiarism detection tools is apparently mature enough for detecting plagiarism not to be challenge. However, plagiarism cases remain common, even in situations where students are aware of the existence of these tools. Part of the problem may be related to the limitations of these tools, as identified by Vallejo (2011), including the fact that students may try to «trick» these tools, language limitations or an excessively burdensome process. Without ignoring the power of these tools, we argue that they are only part of the solution. It is important to complement these systems with changes in the methodology and with the promotion of good practices, looking for honesty and academic integrity.

2. Material and methods

The main objectives of this work are to gain a better understanding of why students plagiarize and to

Academic plagiarism is, unfortunately, a common and widespread issue at all levels. Beyond the most typical cases from young students, it is easy to find high-profile examples of plagiarism reported even in mainstream media. In recent years we have witnessed the resignation of two German ministers accused of plagiarizing in their doctoral theses (Eddy, 2013). And while the problem is not new, the revolution in how we search and process content brought by the Internet has increased the challenge in educational settings. Students are prompted to produce and deliver exercises, essays or solutions to problem statements, and find all this information just a few clicks away.

study whether changes in the presentation of academic assignments can have an impact in the rates of student plagiarism. The study was therefore organized in two stages: (1) a preliminary study to detect which tasks in an existing course presented higher levels of plagiarism and (2) a specific intervention aimed at reducing the rate of plagiarism among the students in those activities where plagiarism was more common.

The hypothesis is that it would be possible to reduce plagiarism by changing the presentation and statement of the activity, while maintaining the relative effort and educational design intact.

2.1. Target course and student populations

This research has been conducted in the context of the course «Mathematics - Complementary course», which is part of an Official Master's Degree in Ele-

mentary Education offered in a fully online modality at International University of La Rioja (UNIR). The assessment of this course is performed according to criteria set by the Bologna Process, trying to increase the importance of coursework activities vs. a final high-stakes exam. The course adopts a hybrid evaluation model in which the final qualification is composed of two parts: 60% corresponds to the in-person final exam; 40% is obtained from scores on a set of course-work activities presented by the student throughout the semester. Students are offered a wide set of activities and need to score 4 points in total. The maximum score of all combined activities is in fact 6 points, and students can therefore choose to focus on particular activities and are not forced to complete all of them.

Two student cohorts from the same course were taken into account in the two stages of this study: Group A: 65 students enrolled in the 2011-12 acade-mic year; Group B: 94 students enrolled in the 2012-13 academic year. The students from Group A were the base for the preliminary study to detect how pla-giarism affected the different assignments during the course. Then, after designing the specific intervention, these students were considered as the control group, while students in Group B were considered as the experimental group.

2.2. Background study: identifying and understand-ing plagiarism in an online course

As mentioned above, the first step in this research was to study the activities proposed for the continuous assessment of a course throughout the academic year, taking into account the rates of plagiarism. Students participated online through a virtual classroom, where all the activities and their corresponding maximum sco-res were provided. These were the activities proposed to students to earn the required 4 points of continuous assessment:

• Self-assessment quizzes: 14 self-assessment quizzes, with multiple-choice questions are offered, one for each of the lessons in the course, with a value of up to 0.05 points per each test.

• Attendance at online meetings: Attending at least two classroom meetings is assessed with 0.15 points.

• Participation in discussion forums: The forums request contributions and discussions among the stu-dents. The student may earn a maximum of 0.5 points, and the rating takes into account the number of inter-ventions and their quality and relevance.

• Open ended assignments: These assignments include activities such as creating a glossary of mathe-matical terms, a study of geometry, statistical analyses,

etc. There are different assignments, with values ran-ging from 0.5 points to 1 point each.

• Readings and personal proposals: Reading assignments focus on review articles, newspaper pie-ces, etc. and make a personal reflection. The student may earn a maximum of 1 point with each activity.

To develop our baseline study, we sampled the behaviour of the students in Group A (2011-12) to understand their participation rates and plagiarism trends.

2.2.1. Understanding student participation

As mentioned in section 2.1, students are not required to participate in all tasks. Each student can decide to focus on different assignments while ignoring others. In order to focus our effort on specific activi-ties, we started by studying participation rates in the 10 possible assignments. Table 1 provides a breakdown of the delivery rates for each activity in the course. Although the preliminary study focused on Group A (2011-12), participation rates from Group B are also provided for comparison.

The activities that typically present a higher parti-cipation rate are the quizzes and attending online mee-tings. The relative simplicity of these activities and the flexibility for delivering them over the entire term may be two of the reasons that make their delivery rate so high. While these activities are not prone to plagia-rism, they remain the most popular among students.

In turn, assignments and readings have varied results, with yield rates diminishing as the course advances and the difficulty increases. Activities 3 and 9 have very low rates and this may be due, primarily, to the fact that both activities involve searching across a variety of information sources, which involves a gre-ater investment of time in completing the task.

2.2.2. Analysis of plagiarism

For this task, we ignored Activities 1 and 2, since they do not involve any production process by the stu-dents. In total, students submitted more than 350 acti-vities during the year 2011-12. Given the time limita-tions faced during the course, we selected a random sample to assess plagiarism rates (up to 23 deliveries per task). The selection was performed randomly for each task, given that the specific students that choose to submit each of the assignments are different. In those activities where the total yield was lower, we included all the exercises delivered. All these activities were analysed using the Turnitin anti-plagiarism tool. The results are presented next grouped by activity.

• Forums: Among the activities submitted on the

Table 1: Delivery of activities in the 2011-12 and 2012-13 course			
Activity	Type	Participation 2011-12	Participation 2012-13
1	Attendance at online meetings	89%	87%
2	Quizzes	82%	80%
3	Assignment: Create your own glossary	8%	20%
4	Forum: What are we thinking when we design a class?	57%	62%
5	Reading: First class numbers (prime numbers)	77%	83%
6	Reading: Reading a newspaper	68%	71%
7	Assignment: Geometry is everywhere	52%	67%
8	Assignment: Exploring Polyhedral	34%	35%
9	Assignment: Statistical project	5%	23%
10	Forum: Arithmetic or Geometry: Can you choose?	17%	22%

After careful analysis, and regardless of the unethical approach from some students, we have to consider the instructional design of the activity as flawed since it is eliciting such behaviour in wide populations of students that seemed capable of delivering original works in other assignments. In contrast, the effort required for the activity does not seem to be a determining factor in increasing plagiarism, since the activity that requested an analysis of the numerical elements of a newspaper was also a high-workload long task and had low rates of plagiarism.

Having reviewed the various activities proposed and their characteristics, it can be seen that those which have a lower rate of plagiarism are the ones that imply a more personal involvement of the students with opinions and suggestions, as well as those in which the contents are linked to elements present in everyday life and closer to the student environment. In summary, in activities that encourage involvement, originality and creativity. From these preliminary conclusions, we endeavour to check whether changes in the design (but not the deep meaning) of an activity can have an impact in plagiarism rates.

2.3. Intervention design

In this section the design of the experiment to reduce plagiarism is presented: after identifying the activity that had displayed the highest rate of plagiarism, this activity was redesigned and presented to a new student population (Group B). These students (n=94) were enrolled in the 2012-13 academic year, in the same course with the same agenda, planning, sequencing and evaluation.

2.3.1. Redesign of activity 5

Activity 5 was selected for the analysis of the hypothesis. The original design of the activity was in the form of an open text question with the implicit goal of having the students to present a report with appropriate data in such a way that they could be used in a primary school syllabus. The statement of this activity was as follows (translated from Spanish):

- Reading: First class numbers: In the recommended reading for this chapter, the Devil of Numbers introduces Robert to some special numbers: those he

two forums, 36.36% included plagiarism. Although the percentage is not high, the kind of plagiarism was very serious, as it is an activity in which the task explicitly requested personal opinions.

• Open ended assignments: Activity 9 on creating a statistical project was only delivered by three students. It is noteworthy, nevertheless, that two of them are completely original, but the third presented a plagiarism rate of 31%. Activities 3, 7 and 8 have particular characteristics, as they ask for descriptions of mathematical content and therefore it is common to use classical definitions, commonly accepted and displayed on many pages across the Internet.

• Readings and personal proposals: In Activity 6 plagiarism was not detected in any case. It is an activity that seeks to analyse the data from a current newspaper locating the various numbers and mathematical concepts that appear in it. Students chose all kinds of newspapers, focusing either on general news or specific topics, and the presentation of this activity was also varied delivering the data in both schematic tables and in more developed reports.

In turn, Activity 5 displayed much worse results. All samples (100%) presented matches with uncited or improperly cited sources (table 2). Seven of these activities (30.4%) included a plagiarism rate above 80%, with the worst case reaching 96%. Only five of the pieces of work analysed returned percentages below 25%.

2.2.3. Preliminary results

Data analysis shows that Activity 5 has the highest rate of plagiarism, combined with the highest participation rate after excluding quizzes and attending online lectures. It is so high that the blame cannot be attributed exclusively to the students who had not resorted to plagiarism in such a high proportion in the other activities. Remarkably, this activity focuses on a very specific topic, easy to look up on the Internet, barely related to news items and with very few direct applications in the classroom.

was calling first class numbers. In the real world these numbers are called prime numbers and as our protagonist says «Mathematicians have spent over a thousand years puzzling over them. They are wonderful numbers. For example eleven, thirteen or seventeen...». Research the meaning of prime numbers and write a short essay presenting the key ideas about these numbers (definition, historical development, properties, curiosities...).

During the 2012-13 academic year, the title and task briefing for the activity were modified, following some guidelines seeking to avoid plagiarism among students, according to the conclusions from preliminary study section. For this purpose, the activity was presented to students as follows:

• Reading: Explaining what first-class numbers are: In the recommended reading for this chapter the Devil of Numbers introduces Robert to some special numbers: those he used to call first class numbers. In the real world these numbers are called prime numbers and as our protagonist says «Mathematicians have spent a thousand years puzzling over them. They are wonderful numbers. For example eleven, thirteen or seventeen...». Research prime numbers, then we propose the following activity: Imagine you in front of a class of children between 9 and 10 years, to whom you have to explain briefly what the prime numbers are. Write half a side of paper (no more than 30 lines), on how would you explain it. If you wish, you may also add a picture or a diagram in the lower half of the sheet. Try to make it fun, original, educational, etc., remember that you are explaining it to children!

• Activity objectives: Be aware of the relevance for Mathematics of the primes; assume the role of teacher preparing (schematically) a class for elementary students; Design a motivating activity relevant to your future career as a teacher.

• Criteria for assessing the activity: The concepts presented and explained about prime numbers and their properties must be correct; the level of originality and creativity in the development of the class will be valued; Suitable writing and spelling.

The new design of the activity gives specific guidelines including the need to develop the activity for a real and relevant environment (Primary classroom).

Table 2: Percentage of plagiarism detected by Turnitin for Activity 5 in Group A			
Students	**Percentage**	**Students**	**Percentage**
Student 1	19%	Student 13	85%
Student 2	33%	Student 14	11%
Student 3	22%	Student 15	24%
Student 4	38%	Student 16	23%
Student 5	40%	Student 17	38%
Student 6	42%	Student 18	42%
Student 7	44%	Student 19	33%
Student 8	69%	Student 20	44%
Student 9	80%	Student 21	54%
Student 10	80%	Student 22	79%
Student 11	83%	Student 23	96%
Student 12	83%		
Average			**50.52%**

The activity is presented as a small piece of research which proposes data search, but requesting delivery of a personal proposal, which seeks student creativity, and not a mere list of the data found. The evaluation criteria explicitly present how to use the supporting materials and how the rigor and clarity of the content posted will be considered. With the new design of the activity, the student is aware that creativity will be assessed, but also is aware of the importance of correctness of the data provided. Most importantly, the evaluation rubric, expected completion time and delivery date remained equal to the original activity, only the task briefing changed.

2.3.2. Experimental design

The redesigned activity will be presented to students in the next academic year for comparison. Students from the 2011-12 academic year (Group A) will be considered as the Control Group, while students from the 2012-13 academic year (Group B) will be considered as the Experimental Group.

Once the course is completed, two important measurements will be taken:

• Measurement #1: An in-depth comparison of plagiarism rates in Activity 5, in order to understand whether the new design resulted in lower plagiarism rates. The plagiarism rates for each group will be analysed and compared using t-test comparisons to check whether there is a statistically significant variance in plagiarism rates.

• Measurement #2: A comparison among the two groups in other activities, to study whether the two groups were truly comparable in their day to day plagiarism practices and in their general performance. This second measurement is important in order to discard significant differences among the two groups (e.g. the experimental group may happen to be initially formed by students with stronger ethical principles in terms of plagiarism).

3. Results

While Group B was larger than Group A, their relative submission rates were reasonably similar, as observed previously in table 1. The two most notable

exceptions were activities 3 and 9. Most relevantly, the average submission rate of activity 5 over the two academic years is over 75%. Despite the change in the design of the activity no significant changes were seen in the participation rate, maintaining a high percentage of submission.

3.1. Plagiarism rates (measurement #1)

The first step was to perform an in-depth analysis of all the deliveries of activity 5 in both courses. In total, there had been 50 submissions in the control group (Group A) and 78 deliveries in the experimental group (Group B), given that students are not required to submit all assignments. Figures 1 and 2 indicate the plagiarism rate found in each exercise submitted by both groups. The results are remarkable, with very few students in the experimental group displaying any rate of plagiarism, and only two isolated cases displaying rates above 30%.

As a result, as can be seen in table 3 the average plagiarism in the experimental group (M=3.87, SD= 10.26) is much lower than the rate displayed by the control group (M=47.66, SD=29.96). This difference was found to be statistically significant, t (56.4=
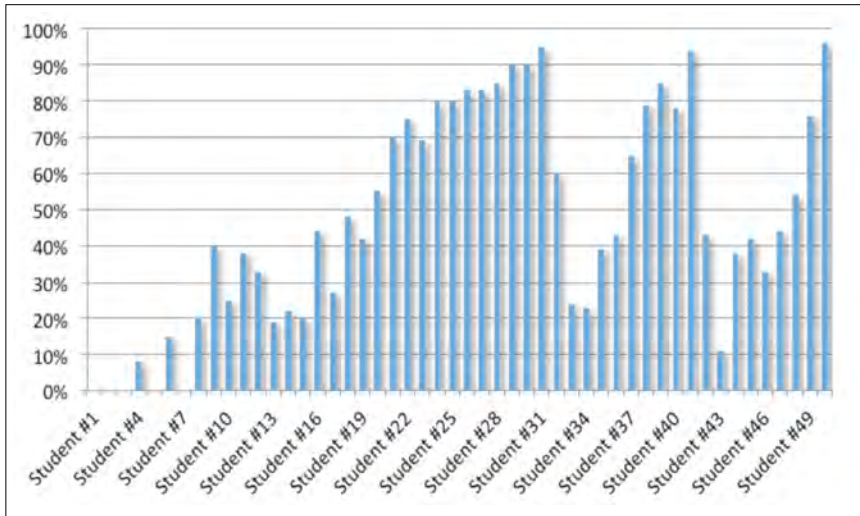
Figure 1. Plagiarism rates in the control group.

9.97, p<.000, d=4.39). Levene's test for equality of variances was found to be violated, and therefore a t-test not assuming homogeneous variance was calculated.

3.2. Performance comparison (measurement #2)

While the analysis from plagiarism rates shows a significant improvement in the plagiarism rates, it was important to address whether both groups were truly comparable, trying to reduce any potential confounding factors. This was especially relevant given that the staff do not have access to demographic data from their student cohorts.

In table 1 it could be observed that the submission rates were reasonably aligned. In addition, we have also studied their performance in another activity to ensure that the two groups were certainly comparable. We have analysed the results for the activity with the second highest rate of coincidences, Activity 7, in which students must select a photograph and analyse mathematical elements that appear in it. This activity had a high degree of overlap,
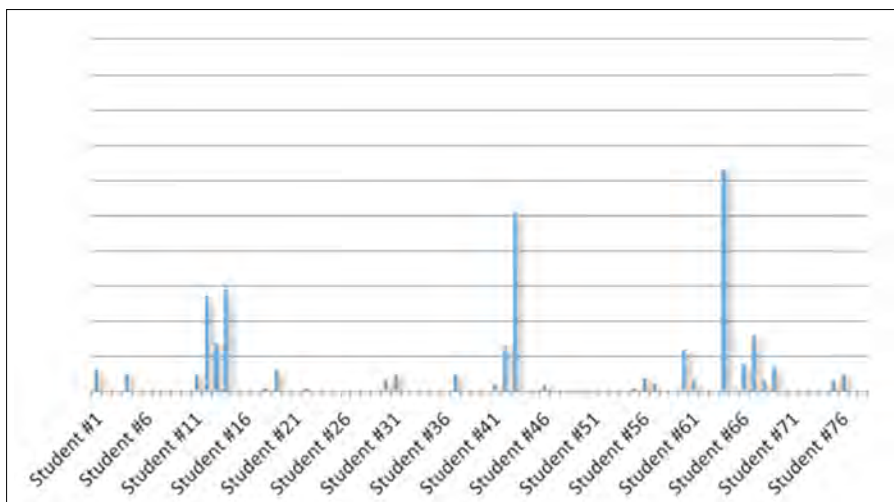
Figure 2. Plagiarism rates in the experimental group.

from multiple sources, usually without references, from which the students extract the definitions that accompany the photographs.

In this case, as observed in table 4, the experimental group performed slightly better (M=22.09, SD=6.24) than the control group (M=28.82, SD=6.01), a difference of only 6.73% that was found to be not significant during the statistical analysis.

Table 3: Average plagiarism rates in Activity 5 (intervention)		
Control Group (2011-2012)	Average plagiarism	47.66%
	Standard deviation	29.96%
	Min. plagiarism	0%
	Max. plagiarism	96%
Experimental Group (2012-2013)	Average plagiarism	3.87%
	Standard deviation	10.26%
	Min. plagiarism	0%
	Max. plagiarism	63%

Table 4: Average plagiarism rates in Activity 7 (verification)		
Control Group (2011-2012)	Average plagiarism	28.82%
	Standard deviation	6.01%
	Min. plagiarism	0%
	Max. plagiarism	80%
Experimental Group (2012-2013)	Average plagiarism	22.09%
	Standard deviation	10.26%
	Min. plagiarism	0%
	Max. plagiarism	85%

4. Discussion and conclusion

Based on the growing interest that plagiarism is receiving in Higher Education contexts, this work has focused in understanding why and how students plagiarize, and in exploring constructive approaches to reducing plagiarism.

We started with a study of plagiarism patterns in an online Master's degree, observing and discussing how each type of assignment resulted in different plagiarism rates. In this preliminary study, we identified which tasks were more prone to plagiarism and tried to alleviate this situation by trying to promote an internal motivation to be creative, as opposed to increasing the severity of our potential coercive methods. This resulted in our main experiment, in which we changed only the instructions of the assignment, but neither the purpose of the task nor the evaluation rubric.

The results present a very obvious difference between the experimental group and the control group, indicating a very strong effect of how the exercise was worded. This indicates that the approach taken by staff had a profound impact in the students' attitude towards the exercise.

We believe that it is especially remarkable that the students did not receive any especial threats warning against plagiarism other than the usual that all groups receive at the beginning of the course. This contrasts with many of the existing perceptions about why students would cheat: laziness, difficult tasks, lack of understanding of the moral implications, etc. In this test, we ellicited a positive response from our students substituting the usual approach (threats of consequences if caught cheating) with a proposal that dared them to be creative and original.

This study therefore shows that it is possible to reduce the incidence of plagiarism by designing activities in such a way that students are prompted to propose their own ideas, and in which they approach the search for information already available on the Internet as a vehicle for their solutions, but not the main task.

It should be noted, however, that this experiment has achieved one of the desired objectives by reducing plagiarism, but the ethical dimension has not been tackled: many of our students still do not understand the ethical implications of plagiarism, and the Internet appears as a large repository of information without any implication. A deeper exploration of the ethical dimension of academic work remains necessary, with a focus on rigour, recognition and valuation of intellectual property, teaching students to respect the work of others as a starting point, but not a final reproducible product.

Finally, we acknowledge that the proposed improvement is limited in terms of the sample size and the elements of comparison, but may be the basis for a more comprehensive study that should expand the study population and may include activities from different courses, degrees and teaching modalities (e.g. online vs. face-to-face). In addition, this study is local to a specific university and language, and should be cross-referenced with other international studies.

The world changes and teaching processes should try to change to keep pace, either through new regulations or teaching methods. We believe that we may have shed some light into the thought process that prompts our students to plagiarize with such carelessness, demonstrating that the solution does not only lie on coercive methods, and that there is room for positive approaches.

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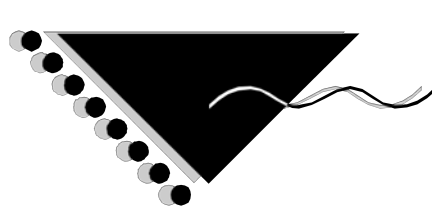
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The Audiovisual Content Downloads among University Students

Las descargas de contenidos audiovisuales en Internet entre estudiantes universitarios

Juliana Duarte-Hueros is PhD candidate at the University of Extremadura in Badajoz (Spain) (j.duarte.h@gmail.com) (http://orcid.org/0000-0003-2357-2979)

Dr. Ana Duarte-Hueros is a Professor in the Department of Education at the University of Education at the University of Huelva (Spain) (duarte@uhu.es) (http://orcid.org/0000-0002-3819-5857)

Dr. Soledad Ruano-López is a Professor in the Department of Information and Communication at the University of Extremadura in Badajoz (Spain) (solruano@unex.es) (http://orcid.org/0000-0003-1963-3898)

ABSTRACT

This article analyses the phenomenon of downloading audio-visual content –movies and television series– which is habitually practiced by university students via the Internet; their attitudes towards illegal downloads; and the education/training that they have about the legal status of this activity. These issues are a frequent reality but are little discussed in our academic context. Data was obtained from a questionnaire designed ad hoc. This was administered to students enrolled in different university degrees (Audio-visual Communication, Primary Education and Social Education). We believe that these college degrees require ethical and legal training on the issues regarding downloading of content from the web. This education is an urgently needed training for young people who will work in educating and informing the citizens of the 21st century. The study results show that university students habitually consume a high percentage of online content from the audio-visual industry (films and television series). Students have clearly favourable attitudes towards this form of consumption. However, students show little regards to the ethical and legal issues surrounding downloading from the Internet. In addition, they have a very low degree of education and training on these issues. The results suggest the need to implement training programs and to conduct information campaigns to improve their information and digital literacy.

RESUMEN

El presente trabajo analiza el fenómeno de las descargas de contenidos audiovisuales –películas y series de televisión– que habitualmente practican los universitarios a través de Internet; sus actitudes ante las descargas ilegales y la formación que tienen en relación a la situación legal de las mismas. Estas cuestiones conforman una realidad que aunque a priori parece ser demasiado frecuente, se encuentra todavía muy poco explorada y es escasamente tratada desde una perspectiva científica en nuestro contexto. Los datos se obtuvieron a partir de un cuestionario diseñado ad hoc, administrado a estudiantes de tres Grados universitarios (Comunicación Audiovisual, Educación Primaria y Educación Social), por considerar que se trata de titulaciones en las que un conocimiento de base ético y legal ante las descargas de contenidos en la red es urgente y necesario para unos jóvenes que se están preparando con el propósito de dedicarse a la formación e información de los futuros ciudadanos del siglo XXI. Los resultados del estudio muestran cómo el consumo de contenidos procedentes de la industria audiovisual (televisiva y cinematográfica), es una práctica asentada entre los universitarios, que tienen actitudes claramente favorables hacia ella pero que prestan escasa importancia a cuestiones éticas y legales ante las descargas no legales, además de tener muy baja formación en estas cuestiones. Los resultados sugieren la necesidad de poner en marcha acciones educomunicativas para mejorar sus competencias informacionales y digitales.

KEYWORDS | PALABRAS CLAVE

Download, uses, audiovisual, contents, illegal, Internet, students, University.
Descarga, usos, audiovisual, contenido, ilegal, Internet, estudiantes, Universidad

1. Introduction and state of the art

The Internet opens before our eyes a wide world of possibilities into which we can submerge ourselves and navigate among a multitude of content from diverse sources, this being extremely important in modern life. However, the unhindered nature of the Internet also comes with a great inconvenience. It has become a place where «self-service» is now the norm. It is now possible to download and use products that are hosted on a web that could be subject to copyright. This use does not have any kind of compensation –economic, moral, etc.– for the author or the «owner». This results in negative consequences for the audio-visual sector or the entertainment industry (León & Varela, 2009; 2010) and could also bring consequences for the economic and social development of many countries (Bai & Waldfogel, 2012; Ritzer & Jurgenson, 2010; Ruud, Heuvelman, Tan, & Peters, 2012).

More specifically, downloading content that belongs to the audio-visual sector, which is defined as «the heterogeneous set of markets that are characterized for directly or indirectly participating in the simultaneous supply and reception of sounds and moving images, independently of the transmission media used or if it is directed towards an individual or a group» (Pablo & Muñoz, 2001: 125-126), is a type of behaviour that is booming around the world. As pointed out at the time by the mentioned authors, the audio-visual industry's own content is very special, as «it can be transmitted and consumed in a physical as well as intangible form, so that the application of commercial restrictions to these types of products are even more so complicated».

Although it is true that from the point of view of the film industry and producing companies, the Internet has increased what is available and widened the range of distribution possibilities of their products, it has also became a highway of thousands of files that were transmitted without any control or restriction. This has resulted in digital piracy, becoming the «main worry of the audio-visual industry, in the same way that it became a daily worry to the music industry in its day» (Clares, 2008: 4). As discussed by Prasad and Mahajan (2003), digital piracy encompasses behaviours such as the non-legal copying of digital material, illegal installation, piracy on the Internet, and the installation of single-user licenses in more computer systems than allowed.

We agree with Moretto (2012: 17) when he affirms that «digital technology and the internet have produced a structural change of important consequences on intellectual property, in which the infrastructure is an important part of the solution, just as the law». This aspect is crucial for the protection of the author's and the users' rights (Breen, 2010; Dimagio, Hargittai, Neuman, & Robinson, 2001; Farre, 2008; López-Sintas, 2011; Regner & al., 2010).

The number of Internet users has increased in the last few years, as shown by studies conducted by Spanish and other international institutions. As a prime example, according to a poll conducted by the National Institute of Statistics (Instituto Nacional de Estadistica, INE)[1], Internet consumption and its frequency of use followed an upward trend in the year 2015, with 78.7% of homes having an Internet connection (almost five more percentage points than in 2014), and 74.7% of the Spanish population are frequent users of the Internet (in the last three months). Along the same lines, a report by the Information Society of Spain in 2014[2] revealed that 26.25 million Spanish citizens are internet users (an increase of 1.45 million from the previous year).

But the most worrying fact is that, just as internet consumption increases, so does the phenomenon of downloading without authorization or piracy. Although it is complicated to find exact statistics on the subject, due to the various ways and methods of downloading that currently exist (Ruud & al., 2012), if we focus on the report presented by the Observatory on Piracy and Digital Consumption Habits[3], in the case of Spain, the pirated contents between 2012 and 2014 were valued at more than 54 billion Euros. In Spain, 8476 accessing events to illegal content per minute have been registered (as compared to 5800 that were registered in 2012). And this is true even after a new Intellectual Protection Law came into effect at the start of 2015[4]. This law introduced a series of measures that were grouped into three blocks –measures that revise the system of private copies; measures that establish mechanisms of supervision of the entities that manage the intellectual property rights, and measures that are aimed at looking for infringements of said rights in the digital environment. Although it is still too early to analyse the effect of the law (Moreno, 2010), we believe that it would be interesting to understand the degree of education that the population has on the legal and ethical consequences that come from legislation related to intellectual property.

Based on the literature review (Akbulut, 2014; Buse, 2009; Cuadrado & Miquel, 2010; 2011; Cronan & Al-Rafee, 2008; Gupta & al., 2004; Higgins, 2007; Jambon & Smetana, 2012; Ribina, 2014; Ruud & al., 2012; Williams & al., 2010), it is possible to observe that many of the research works deal with the down-

loading of music-related products, and software in general, and not so much with the the downloading of film content and TV series (Ruud & al., 2012). This study takes into account Cuadrado and Miquel's work (2010), which analysed the attitude and ethics of the users towards musical piracy; it also takes into account the works by Akbulut (2014) and Cuadrado and Miquel (2011), where the authors analysed two models of structural equations centred on the pre-disposition of the users towards digital piracy in the first case, and towards music piracy in the second; as well as a comparative study by Gupta and others (2004) on the influence of ethics versus other variables in the making of decisions by the consumers when acquiring software.

In the first research work mentioned, the researchers focused their efforts on the analysis of general guidelines that people followed (aged between 14 and 45) when consuming music, and their attitude and ethics towards music piracy, mainly from the perspective of demand. They identified six factors (ethics, loss, legal, value, benefit and economy) as determining factors (explicative) of the attitudes shown by the study subjects.

In this study, the common nature of the consumption of illegally downloaded music was evidenced, but the participating subjects did not show a truly binding ethical position as for the correctness of non-legal downloading and/or selling music, and the authors even affirmed that «while it was generally agreed that buying from unlicensed street vendors was illegal, their opinion on the legality of a download from the internet was not explicitly shown» (Cuadrado & Miquel, 2010: 10).

Taking this result into account, the authors performed a second study (Cuadrado & Miquel, 2011), in which they considered the «past behaviours of non-authorized internet downloading» as fundamental issues that were important for delimiting the possible prevention measures and therefore overcoming of the problem that illegal downloading meant for the music industry.

Due to these past behaviours, the authors focused on diverse variables that had been identified in other theories and theoretical models. Variables such as social and demographic profiles, attitudes and motivation that belong to the Theory of Reasoned Action

(Ajzen & Fishbein, 1980); ethics and social acceptance of behaviour (issues raised in the Theory of Planned Behaviour (Ajzen, 1991); as well as explicative motivational models found in the Technology Acceptance Model (TAM) (Davis & al., 1989).

Among the results, we should point out that although only two of the variables considered in their study seemed to have a direct influence on the intention of downloading music (attitude towards downloading and perceived abilities to do so), the other three had a specific influence on the attitude towards piracy (past behaviour, ethical pre-disposition and general

> The students surveyed affirmed that the downloads were mostly «pirated»: 67.03% of those polled said that they downloaded «pirated» content –free, without authorization from the author, followed by «free» products– with the author's authorization, for a total of 13.19%

degree of involvement).

On the other hand, the last work mentioned (Gupta & al., 2004: 261) was also centred on the attitudes of individuals towards piracy, although in this case it was focused on software, differentiating between ethical considerations and perceived legality, as well as other variables that were economic and legal in nature (such as being conscious of the criminal or punitive consequences and the social impact)

These research works have been used as our starting points and have guided the study performed on behaviours, attitudes and the uses given by the subjects with respect to downloading audio-visual contents from the internet. To these we add another dimension, which is more related to educative-communicative training and education of the youth, which has been proposed as being essential by diverse authors such as Aguaded (2012). This author affirms that «teaching and social institutions have frequently and excessively ignored present-day education, cultural and political changes found in the contemporary world».

2. Materials and methods

Similar to Martín-Moreno (2007) and Sanz-Casado (1994), our study is based on the study of users, within the lines of applied, empirical and exploratory

research, while also having descriptive, correlational and explicative requisites.

The objectives of the study were: To analyse the habits of audio-visual (movies and television series) consumption via the internet of university students; to detect their attitudes, knowledge and abilities as related to illegal downloading of content from the web; and to describe the education/training they perceive to have in relation to legal and ethical issues on the subject. With the combination of the information obtained through the literature review of academic and legal texts on the subject, along with the declara-

object of study were selected, and to these other questions, which were not necessarily found in previous studies but were considered important for our study, were added.

Once the first revision was done, and to ensure the instrument's validity, it was evaluated using a panel of experts. For the selection criteria, we opted for a group of four experts that were renowned in the sub-

Table 1. Dimensions of the questionnaire	
Personal and demographic data	Gender, Education, Centre, professional and economic situation.
Use of ICTs and their relation to downloading	8 items related to the availability of technological means; to the use of these means for the downloading of content and their in-stream (on-line) viewing; types of downloads performed; habits of «sharing and recommending».
Knowledge and abilities for piracy	2 items on self-perception of their own computer abilities and knowledge for the non-authorized downloading of series and movie from the internet.
Attitudes and motives	5 items on their attitude and motives for the behaviour of downloading without authorization from the internet in the cases where the authorization was required.
Legal knowledge and education	12 questions on the degree of knowledge and education on current laws related to the free downloading of series and/or movies without authorization, as well as the buying-selling without a license of pirated files and their corresponding sanctions.
Ethics	5 items on ethical concerns on piracy in general (download, buying and selling)

tions by the study participants, we believe we can offer a more complete picture of the subject.

For the methods used for data acquisition, we followed authors such as Briones (2008), Rodríguez and others (1996), Sierra (1994), and opted for a mixed method. For the quantitative data, we obtained specific data from the answers given by the subjects to close-ended questions (yes/no answers). To these data, qualitative contributions were added, which originated from the literal responses given by the subjects to open-ended questions.

For the field study, we designed a questionnaire comprised of 32 items, structured into four large sections: Uses of ICT resources and their relation to downloading; Knowledge and Abilities; Attitudes and Motives for downloading free and unauthorized content from the internet; and Legal and Ethical education. For the creation of the questionnaire, a detailed review of the items used in previous research work was performed (Cuadrado & Miquel, 2010; 2011; Gupta & al., 2004).

After the review, the items were grouped according to content and spread among the four dimensions that we started with: uses, attitudes, knowledge and education. The next step was to re-formulate the questions, in order to make them more clear and concise. Then, the ones that were more adequate for our

ject matter (three professors from the University of Huelva, and one from the University of Extremadura, selected due to their experience in legal matters related to internet downloading as well as their expertise in communication, educational technology and research methodologies). These experts were asked to evaluate the instrument in its totality, the degree of relevance of each of the items included, and the degree of precision and appropriateness as well as the syntactic and semantic degrees. Once the questionnaire was corrected based on the answers by the experts, the instrument was configured as shown in table 1:

The items on the questionnaire can be classified into four types of questions, in agreement with Sierra (1994), as a function of the type of information that we sought to gather: Open-ended questions, dichotomous in character; categorized questions, also called multiple-choice questions; and questions with answers that used a Likert scale, used when the degree of intensity of the answer obtained was needed.

In order to ensure the reliability of the instrument from a statistical perspective, and similar to Bisquerra (1987), after the classification of the questions into three groups according to the type of answers given (a pre-requisite for finding the greatest reliability index possible), an Alpha value, or internal consistency index, above .75 in the three groups (G1α=.817; G2α=

.808; G3α=.793) was found. These results led us to conclude that the instrument used had a high reliability or internal consistency.

The selection of the sample was «intentionally directed» with the criteria for inclusion being: university students; enrolled in Degree programs related to education and communication; between 20 and 30 years of age. Therefore, our target population were the students enrolled in the Audio-visual Commu/nication Degree in the Library Science and Documentation Faculty at the University of Extremadura, and the Primary Education and Social Education Degrees at the University of Huelva. The field study took place in the months of April and May of 2014. The participation of the subjects was random, according to accessibility and availability of the student body during the completing of the questionnaire via the Moodle platform in the computer lab. The surveyors were two collaborating researcher students that had the prerequisite training for providing the surveys and the knowledge on how to act in case of doubts.

Lastly, the participating sample was comprised of 192 students, of which 46% were enrolled in the 3rd and 4th years of the Audio-visual Communication Degree (N=88); and the other 54% were enrolled in Education Degrees (N=104) (2nd year of Primary Education=37% and 2nd year Social Education= 17%). Of the 192 students, 40.22% were men, and 59.78% women. Age-wise, the mode was between 20-22 years of age (71.70%); 16.30% were 23-25 years of age, and only 12% were older than 25 (of which, only two attested to being older than 30).

For their professional/work situation, 22.47% were identified as university-study grant holders; almost 8% as looking for work, and the option «dedicated to household work» only comprised 2.25% from the total. As for their economic situation, most of those surveyed depended economically from third parties (98%), but half of them affirmed that they made it to the end of the month, while 38.13% also depended economically on other people, but affirmed that they had economic difficulties at the end of the month.

3. Analysis and results

The analysis of results was performed from a mixed perspective having both quantitative and qualitative natures: In first place, we quantitatively analysed the data obtained with the statistical package SPSS 15.0 (descriptive statistical measurements of central tendency and dispersion were obtained, as well as a factorial analysis for the extraction of principal components).

In second place, the data gathered from the open-ended questions were analysed, using qualitative content analysis in order to obtain the most complete explanation of the results found in the previous analysis. For this, the answers given by the participants were reviewed in «raw» format, extracting units of analysis (words and phrases) that were considered to be significant. At first, these were re-labelled into codes or keywords used for the main theme of the research, and posteriorly into exhaustive, exclusive, pertinent and objective categories (Cáceres, 2003). Once these categories were established, the different units of analysis were classified by two different coders, making sure that there was some degree of agreement between them at all times. This was done in order to ensure «semantic» validity (Briones, 1988).

For our first objective, «Understand the use given to ICT resources and their link to downloading», we specifically sought to detect: the availability of technological means; the use of these means for the downloading of content and for in-streaming viewing, as well as the type of download performed. In broad terms, we concluded that the participating sample had available a great number of computer resources. Overall, they had a desktop computer and a portable computer (94% of the sample affirmed to having a portable computer), as well as Smartphone-type devices (the figures revealed an expected result; 87.50% of the students attested to having this type of smart mobile device).

After analysing the Internet connectivity results, the results showed that the availability of a «private connection» was very high. 86.36% of the subjects positively responded to this question, as opposed to 12 subjects that indicated not having their own connection, and 4 who did not answer.

In the case of using some type of outside connection without authorization, only 17 of the participants (8.8% of the total) affirmed to having done so at some point in time, with this value considered not to be high.

As for the habits of consumption of television series or movies on the internet, 40% of the participants affirmed to never downloading, or in-stream viewing, series or movies on the internet with their desktop computer, as opposed to the other 60% who attested to having done so on certain occasions, and even many times. However, in the case of a portable computer, the values differed greatly. 89.29% of the sample agreed to having used it to download audio-visual content, and this figure even increased to 92.77% when discussing in-stream viewing, which was also done by using their smartphones or other mobile devices such as iPads or other type of tablet computers.
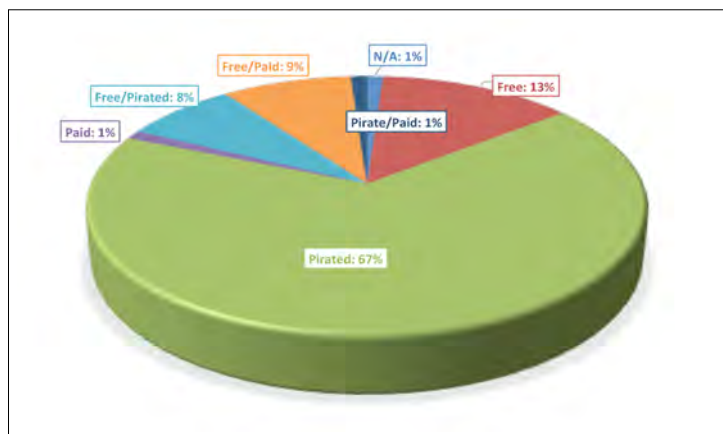
Figure 1. Types of downloads frequently done by those polled.

Economic issues, followed by the elevated cost of movie theatre tickets and films, and the due to convenience of downloading and the subsequent viewing at the place and time chosen by the user were the main motives for non-authorized downloading, as pointed out by the participants.

Another of the items that were considered interesting in this study were the polled subjects' favourite websites and applications for downloading, as well as their tendencies for sharing (or not) the illegally-downloaded content. In this case, the websites that were most-commonly mentioned were «Series.ly» and «Series Yonkis». For the in-stream viewing, «YouTube» and once again «Series.ly» were the most popular, as can be observed in figure 2.

It is interesting to note that from the total sample, most affirmed to having used their own connections to download as well as to view audio-visual content (65.2% and 68.5%, respectively), either while committing piracy or not.

Our second objective was centred on «To detect their students's knowledge, abilities and attitudes in light of illegal downloading of content from the web». The results related to the knowledge and abilities that the students attested to having for the non-authorized downloading of series and/or movies from the internet were very similar to previous questions: 85.85% of the students that completed the questionnaire said that they had the necessary abilities for downloading series and/or free movies from the internet. Also, 70.65% mentioned knowing very well about some program for downloading online content without cost and without authorization.

The students surveyed affirmed that the downloads were mostly «pirated»: 67.03% of those polled said that they downloaded «pirated» content –free, without authorization from the author, followed by «free» products– with the author's authorization, for a total of 13.19%, as shown in figure 1.

The subjects, through their answers to the open-ended questions, left a clear mark about a positive attitude for «sharing and recommending» the downloaded content. More specifically, 50% of them attested to having shared pirated content, and from this group, 80% recommended it.

The results of our third objective «To describe the education or training they perceive as having in relation to the legal issues of downloading», 45.05% of the students assured to be not familiar with the laws regarding non-authorized downloading from the internet. However, most of them seemed to be able to clearly identify the nature of «legal» or «illegal» downloading
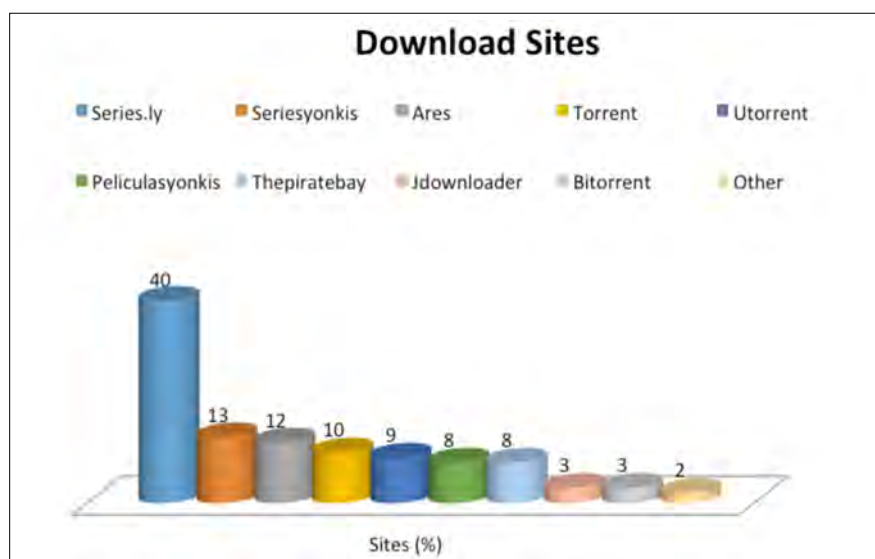

Figure 2. Download sites specified by those polled.

of series and/or movies from the internet without authorization, as well as the purchasing from unlicensed street vendors, with these behaviours recognized as non-legal by 76.1% and 88% of the sample, respectively.

As for the subject's perception on the consequences of these types of activities, we determined that 67.39% of the sample affirmed that the purchasing from unlicensed street vendors did not imply future (legal) consequences. For non-authorized downloading and for the consequences of being discovered performing this type of practice, 30.43% assured that it was very simple to pirate without being caught; and in case that they were, 21.17% manifested that there were no consequences. In fact, the great majority of those polled (92%) affirmed that they did not know the legal sanctions for pirating content or acquiring them through unlicensed street vendors.

Lastly, the results on the ethical dimension showed that only half the sample considered «non-ethic» the sharing of content of this type; only 82.6% of the sample considered «non-ethic» the selling of said content, and 77.2% buying them.

4. Discussion and conclusions

With the results obtained, and beginning with our interest for knowing what the nature of the television series and films the students downloaded was and what other type of content they accessed, we have determined that the downloaded products were mostly obtained freely and without authorization. This means that we can point to the clear presence of practices related to «piracy», in agreement with other results obtained in other studies (Gil, 2006; Meissner, 2011; Rybina, 2014; Taylor & al., 2009). To this, we should add that the subjects admitted to having the habit of sharing files –that others had downloaded from the web– with third parties, without them (interested in) knowing where they had been originally stored, and they even recommended these contents to other people.

Likewise, we have determined that the use of portable and desktop computers predominated for downloading, while wireless devices such as the Smartphone, the iPad or other Tablet PCs were used for in-stream viewing. This could be due to connection issues, as the downloading capability of each of ICT resource varied as a function of the available connection at each moment in time. As for the type of connection, the use of private and outside connections predominated, but this time with authorization.

On the motives that drove the students to downlo-

ad, similar to previous studies performed by Cuadrado and Miquel (2011), we can conclude that it was the economic issue that mostly impelled free downloading without authorization, followed by the elevated prices of movie theatre tickets and original films. To these results, we can add issues such as «convenience» (the students affirmed to download because it was more convenient). Downloading could lead towards a new precept of rupture of spatial and temporal barriers, imposed in the last few years by the new technologies: «available at any time and any place».

On the other hand, this study started with the idea that the student's knowledge of legal issues was scarce, which is directly related to the act of downloading. Based on the results obtained, we determined that they had a low degree of education and training in this type of issue (more than half of the participants ensured having little, some or no knowledge about this issue; while two thirds of the sample considered it insufficient). Also, we have assessed a certain confusion as to the existing consequences or legal sanctions in response to non-authorized downloads, although subjects were extremely clear on their opinions in the case of acquisitions of pirated CDs from unlicensed street vendors.

As for the «ethics» dimension, again the direction of the answers was clear: those polled believed that the purchasing, selling and the act of sharing downloaded series and/or movies without authorization was unethical. On this issue, they did not have enough or needed education and training, which we found to be worrisome, especially in the case of the young participants of our study, who at this time are being educated and are the ones who will have the responsibility of educating and informing the citizens of tomorrow.

To conclude, it should be mentioned that we are conscious of the need to confirm the data obtained in this research work with future research using a larger sample, in order to attain greater scientific validity. This is an initial study with data that is not yet applicable to the general population. But, we believe that the results elucidated from the analysis of the responses given by those polled allows for glimpsing a few conclusions that could be of interest, while at the same time re-affirming the results from past research studies.

We also believe that the instrument that we have developed and used to gather information has had the necessary consistency to be able to be applied to different contexts. It could be interesting to broaden the study to other popular content on the web, such music, software or videogames, so that relationships and differences can be established among them.

Last but not least, the research performed points to the urgent need for a more complete and consistent education on the responsible use of Information and Communication Technology for all the citizens of the 21st Century. This education should be oriented towards empowerment from the media, just as pointed out by Aguaded (2014: 7), «the best strategy is to consume (media) in an intelligent way, and enjoy and make the best use of them in our everyday lives; to learn about them, get to know them and relate to them».

Notes

[1] The results of the polls given at the national and the Autonomous Communities are available on the I.N.E website. (http://goo.gl/-Zi3DGw) (2015-09-22).

[2] The complete text can be found on the Fundación Telefónica website: (http://goo.gl/uj9Rki) (2015-11-10).

[3] Information gathered from the «Coalición de Creadores e Industrias de Contenidos» website. In this website, part of the cultural and entertainment sector from Spain in music, films, videogames and books is integrated in this website.

As indicated on the web, the coalition assumes that «working in the bolstering and development of a few activities are necessary in order to avoid the infringement of intellectual property rights on the internet. It promotes knowledge on the activity of the creators and the content industries, and enables agreements and alliances for promoting a digital environment that is respectful with intellectual property» (http://goo.gl/ofUMw5) (2015-02-15).

[4] Law 21/2014, from November 4th, which modifies the rewritten text found in the Intellectual Property Law, approved by the Legislative Royal Decree 1/1996, from April 12th, and the Law 1/2000, from January 7th, of Civil Procedure. Official Government Gazette n° 268, Spain, November 4th, 2014.

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Internet Use and Academic Success in University Students

Usos de Internet y éxito académico en estudiantes universitarios

Dr. Juan-Carlos Torres-Díaz is Research Professor in the Department of Computer and Electronic Sciences at the Universidad Técnica Particular de Loja (Ecuador) (jctorres@utpl.edu.ec) (http://orcid.org/0000-0003-1503-0379)

Dr. Josep M. Duart is Professor of Education and Psychology Studies on the Doctoral Program at the Universitat Oberta de Catalunya (Spain) (jduart@uoc.edu) (http://orcid.org/0000-0002-5123-0370)

Dr. Héctor-F. Gómez-Alvarado is Research Professor in the Department of Computer and Electronic Sciences at the Universidad Técnica Particular de Loja (Ecuador) (hfgomez@utpl.edu.ec) (http://orcid.org/0000-0002-7310-4260)

Dr. Isidro Marín-Gutiérrez is Research Professor in the Department of Communication at the Universidad Técnica Particular de Loja (Ecuador) (imarin1@utpl.edu.ec) (http://orcid.org/0000-0002-6858-0983)

Verónica Segarra-Faggioni is Research Professor in the Department of Communication at the Universidad Técnica Particular de Loja (Ecuador) (vasegarra@utpl.edu.ec) (http://orcid.org/0000-0002-7275-7411)

ABSTRACT

The use of technology is changing the way things are done, including the work in universities where the teaching and learning process are changing, and it is required to know the effect of technology on student achievement. In this research work, we present the influence of Internet use on academic success of students from five universities in Ecuador. A random sample of 4,697 people was got up and categorized in two groups: the use of Internet in academic activities and entertainment, using factor analysis and cluster analysis; the resulting categories were used as independent variables in multinomial logistic regression model which are seeking to determine if the use of Internet has impacted on academic success. The results show that people who perform interactive activities with peers and teachers or use in a balanced way the different internet tools tend to have more academic success than those who only seeks information. Regarding to the use of Internet in entertainment, a positive impact was found on academic achievement. Students who download audio, video and software, and students who use all the entertainment possibilities show less likely to fail than who using minimally Internet. In terms of gender, it has different effects for entertainment and academic purposes.

RESUMEN

El uso de la tecnología provoca cambios sociales. Esto incluye el trabajo en el ámbito universitario en donde está cambiando tanto la forma de ejercer la docencia como la forma de aprender y se requiere conocer el efecto del uso de la tecnología sobre el rendimiento del alumnado. En este trabajo se investigó la incidencia del uso de Internet sobre el éxito académico del alumnado de cinco universidades de Ecuador. Se levantó una muestra aleatoria de 4.697 personas y se las categorizó en perfiles de uso de Internet para actividades académicas y para entretenimiento, utilizando análisis factorial y análisis clúster. Las categorías resultantes se utilizaron como variables independientes en modelos de regresión logística multinomial que buscaban determinar si el uso de Internet tenía incidencia sobre el éxito académico. Los resultados muestran que quienes realizan actividades interactivas con pares y profesores o quienes utilizan de forma balanceada las distintas herramientas de Internet tienden a un mayor éxito académico que aquellos que solo buscan información. En lo referente al entretenimiento, se encontró una incidencia positiva del uso de Internet sobre el éxito académico. Los estudiantes que realizan descargas de contenido de audio, video y software, y quienes utilizan todas las posibilidades de entretenimiento, presentan menor tendencia a suspender que los estudiantes que utilizan mínimamente Internet. En cuanto al género se presentan diferencias en los usos académicos y de entretenimiento.

KEYWORDS | PALABRAS CLAVE

University, academic achievement, entertainment, digital divide, interaction, online, assessment, games.
Universidad, éxito académico, entretenimiento, brecha digital, interacción, on-line, evaluación, juegos.

1. Introduction

Academic achievement among students generally equates to the effort expended, and is related to intellectual and environmental factors. Habits acquired at an early age such as an interest in reading, or a lack of resources with which to develop elementary capabilities such as verbal comprehension and production are also an influence (Lucas, 1998).

Academic achievement is multidimensional and shaped by variables that are difficult to systematize within a specific model (Fullana, 1992). Educational success is usually measured by rudimentary testing that fails to take into account basic cognitive dimensions that form part of a systematic process. Variables can be personal, academic or social (Fullana, 1992). In recent years, several approaches have developed around the Bloom taxonomy (Bloom & al., 1956) that more or less coalesces around three psychological domains: cognitive, affective and psychomotor. There has also been a boom in instruction in, and assessment of, competences that insists on the need to develop generic and transversal competences, as well as those skills specific to each study area (Villa & Poblete, 2007), teaching students to «learn how to learn» and to acquire greater capacities in line with today's ever-changing times. Academic achievement can be measured from various perspectives: efficacy, for example, grading the level of success in reaching set objectives in a course program, which provides important information for decision makers in educational institutions. A study by Duart & al. (2008) analyzed universities in Catalonia (Spain) and used as main indicator the relation between the number of subjects passed against the number of subjects students had matriculated for, thus enabling students to be categorized in terms of high, medium and low academic achievement. Other variables included gender, age and socio-economic strata. For gender, women outnumbered men by 10% in the high academic achievement category, and for age, students under 25 got better academic results.

Since then, technology has been added to the traditional indicators of academic achievement, meaning the technological environment at institutional level, access to Internet and how students use it, factors which Duart & al. (2008) define as «new determinants of academic achievement», and which influence students' work on various levels and in different ways. An educational institution's technological environment, if properly established, is an important factor in the development of a culture of technological usage. Although this by no means guarantees academic success, it does enable the student to develop good practices that can contribute to achieving academic goals. Duart and Lupiáñez-Villanueva (2005) pinpointed three areas in which the university as an institution had undergone changes: technological infrastructure, innovation among teachers and organizational restructuring. As a result, the most relevant factors affecting students on entering university are the level of technology within the educational model and the need to apply it to the development of the curriculum map, and the role of the teacher in directing students in the use of the information and technology available as learning tools and resources.

Various studies have found that Internet use can have positive benefits on educational achievement while others conclude that this outcome is not so obvious (Chen & Fu, 2009; Gil-Flores, 2009; Hunley & al., 2005; Luaran & al., 2011; Raines, 2012; Suhail & Bargees, 2006). The variables used to measure the influence of Internet use on academic success include student online activity for task completion, time spent on the Internet, and access to a computer and Internet connection at home. However, no firm conclusions are drawn on the issue since results from other studies performed under similar conditions have been contradictory (Antonijevic, 2007; Azizi, 2014; Ellore & al., 2014; Junco, 2015). Other studies show that the use of technology has a positive effect on certain cognitive areas such as the development of spatial skills and memory, and improved reading, writing and information processing skills, but this does not necessarily lead to better academic achievement. This fits with the Fullana concept (1992) of multidimensional forms of mediation. Heyam (2014) carried out a meta-analysis of the use of technology, in particular social networks, with regard to student performance, and drew two conclusions: technology and social networks facilitate communication, socialization, coordination, collaboration and entertainment; but they can also cause addiction and lead to time wasting, information overload and physical isolation from society.

Other studies have found relations between the use of technology and factors associated to academic achievement, one such being Gil-Flores (2009) who saw a significant link between computer usage and educational success. This study found that high school students who use a computer at home more often scored higher marks in maths and languages. Although Internet was not a determining factor, it at least establishes a relation between the variables. Another study involving high school students (Ndege & al., 2015) indicates the positive effects of technology in boosting the potential for communication and interaction, as well as the downside, which is that time is often was-

ted, leading to less time spent on academic activities.

Mishra & al. (2014) carried out a study of university students that analyzed the relation between the average of student scores and the time spent searching on Internet. The results revealed a significant negative relation in that the more time spent online, the lower the average mark. They also found a significant positive relation between the perception of the time students thought they needed to spend on sites with academic information and the average mark. Türel and Toraman (2015) found that men tend to spend more time online than women. They also concluded that as the average mark considered to be a good pass rose, so Internet addiction declined. So, the control should center on students who use Internet more than three hours a day. Lepp & al. (2015) measured the impact of cell phone use on the average marks scored by university students, and found that the greater the cell phone use, the lower the average.

Chen & Fu (2009) concluded that online information searching improved exam results. Other studies in Pakistan found that Internet use had a positive effect on marks, and improved reading, writing and information processing skills (Suhail & Bargees, 2006). Computer resources such as games had a positive effect on spatial skills and memory, as well as developing visual and auditory capacities, thus stimulating overall student development (Subrahmanyam & al., 2001). One recurring element in the studies is the relation between academic achievement and home computer access. On the other hand, no link has been established between academic achievement and computer use at the educational center (Gil-Flores, 2009). Other studies show that students who search out information online get better marks because they have access to more data sources and are thus better informed on the subject (Leung & Lee, 2012). This fits with Kupczynski & al. (2011) who studied the behavior of students in Internet courses, finding that the most active (higher number of online sessions) had greater educational success. Castaño (2011) highlighted the benefits of student interaction for academic achievement, with the benefits accruing more to online students than to those who physically attended classes.

Sciences in general and certain subjects in particu-

lar vary in the approach required for studying them, and technology can make a positive or negative contribution to learning. A study by Antonijevic (2007) found that computer use proved very valuable for science students but had the opposite effect on maths students. The use of technology in learning directly affects academic achievement. This is evident in a study by Wittwer and Senkbeil (2008) who discovered no link between computer access and performance in maths. However, using a computer to solve problems had a positive effect on students.

> Women tend to make less use of technology for entertainment. On the other hand, comparing balanced profilers to downloaders, both men and women are equally represented and no clear trend is visible. We can conclude that in terms of entertainment women prefer to download information than play games online.

When it comes to entertainment, there is a marked difference in gender, as young women tend towards social networks while young men prefer online gaming (Fernández, Peñalba, & Irazabal, 2015). Young people who present an addiction to Internet usage also have lower academic achievement (Frangos, Frangos, & Kiohos, 2010). The trend is for students to score lower marks the more time they spend on online gaming (Ip, Jacobs & Watkins, 2008). Pepe (2011) found similar results in primary school students. Results tend to show that the time spent searching for information on Internet helps to raise marks and improve socialization whereas time spent online gaming has the opposite effect (Chen & Fu, 2009). Hunley & al. (2005) showed that the amount of time spent on the Internet had limited effect on high school students' academic achievement, yet GPA test scores show no relation to specific online activities such as information search, use of email and videogames. This contradiction in the results of various studies reveals the need for deeper investigation in order to probe systematically the true nature of academic achievement and its determinants. This could shed light on the beneficial uses of technology

Table 1. Variables for the use of technology in performing academic activities

Variables	Factors	Explained Variance
Read and write on blogs dedicated to coursework. Read and write on wikis related to coursework. Use social markers (e.g.: http://del.icio.us). Write emails regarding coursework. Chat on forums dedicated to academic issues.	Communication	27.53%
Consult a teacher. Consult colleagues. Post and comment on social networks. Participate in online forums. Access the university's online platform. Download educational material and resources. Watch videos related to coursework.	Participation	27%
Search for coursework information on Internet.	Information Search	12.73%

variables that asked the students how many subjects were taking and how many they had failed in the last semester.

2.3. Procedure

We created a variable to represent Internet use for academic activities and another for Internet use for entertainment, so students were classified according to the use of technology for coursework or for entertainment. To construct the «academic uses» variable, we presented 13 questions to measure the use of various technological instruments in academic activities (table 1), and a factor analysis was performed to reduce the number of variables and group them in factors. The factors were Communication, Participation and Information Search, and they were subject to a k-means clustering analysis. To guarantee the consistency of the classifications, groups were created by first calculating the centroids from a subsample and then using them to generate the groups. Students were classified in 2, 3, 4 and 5 groups, from which one was selected that presented the greatest accuracy and best ease of interpretation of the groups' structure, following a discriminant function analysis. This analysis was carried out using the group number generated by the cluster analysis as a dependent variable, and the factors from the factor analysis as independent variables (Cea, 2005; Díaz-De-Rada, 1998; Shunglu & Sarkar, 1995). This enabled us to determine the percentage of elements correctly assigned to each classification. We then divided the classification into three groups, as the easiest way to interpret them, and the three groups' centroids for each variable are shown in figure 1.

A similar procedure was applied to develop classification based on the use of Internet for entertain-

on academic work, and inform teachers on how best to instruct students in the use of technology.

2. Material and methods

Two hypotheses were posed, which stated that the use of technology for both academic and entertainment purposes had a positive effect on academic achievement.

2.1. Population and sample

The sample was selected from students attending five universities in Ecuador between February and May 2015. A total of 4,697 students were surveyed at random, of whom 48.5% were men and 51.5% were women.

2.2. Data-gathering instruments

A tool was developed based on questionnaires used in the Proyecto Internet Cataluña (UOC, 2003) and the Digital Literacy in Higher Education Project (DLINHE, 2011), and adapted to the requirements of this research. The questionnaire did not require students to state which degree course they were studying. It was divided in two parts, the first containing 13 questions on the use of technology for performing academic activities; the variables are presented in table 1.

The second part of the questionnaire extracted information on the use of technology for entertainment by means of 10 variables, presented in table 2. It also gathered socio-demographic information using the variables of age, gender and income, the latter measured on a five-level scale. Information on academic achievement was obtained from two

Table 2. Variables for the use of technology for entertainment purposes

Variables	Factors	Explained Variance
Post comments on social network profile. Make comments and contact friends on social networks. Chat online. Upload videos and photos.	Socialization	30.58%
Download programs. Download music or films. Watch television or listen to the radio.	Downloads	21.78%
Purchasing. Selling. Online gaming.	Transactions and games	20.71%

ment. The variables used and the resulting factors from the factor analysis are shown in table 2. The final categories of this classification are shown in figure 2.

We also created a variable to represent academic achievement, so students were categorized in four groups according to the number of subjects failed. This was obtained by subtracting the number of subjects passed from the number of subjects taken (subjects failed = subjects taken, subjects passed). This gave us four categories: no subject failed, one failed, two failed,

Figure 1. Groups according to use of technology for academic activities.

more than two failed. The correlations established are: the uses of the Internet for academic activities and academic achievement, and the uses of the Internet for entertainment and academic achievement. The correlations were obtained using multinomial logistic regression models.

3. Results
3.1. Categorization of the students

Classification based on the uses of the Internet for academic activities divides the students into three groups (figure 1) or profiles: the dedicated academic profile scores high in all factors, especially in Participation, which is its distinctive element and refers to interactive activities and work carried out using educational material. The homogeneity in the values for this profile demonstrates a balanced use of Itools. In the Communication factor, there is a similarity between the information seeker academic profile and the dedicated profile. The information seeker academic profile presents the lowest values in the Participation factor
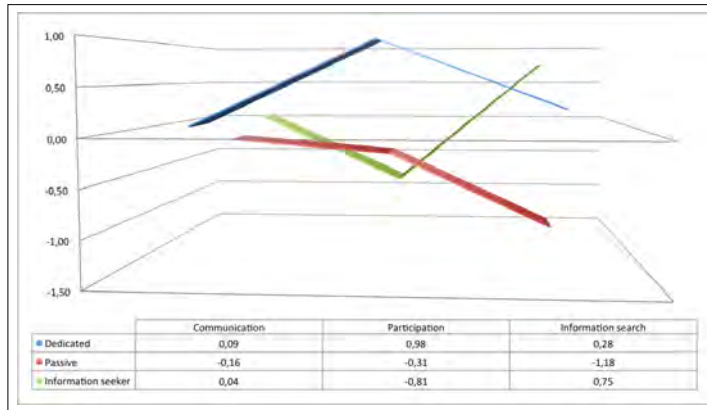
and the highest in Information Search. Its main characteristic contains a contradiction in that it has a high level of information search and a low level of interactive activities and work with educational material, which indicates an imbalance in the use of Internet tools. Finally, the passive academic profile has its lowest levels of intensity in information search and the use of social network tools; and the intensity levels are low for interactive activities and work with educational material, yet they are higher than those for the information seeker profile.

Classification of students based on the uses of the Internet for entertainment activities divides them into three groups (figure 2). The first is the download entertainment profile and is composed of 32.4% of the students surveyed; it has the highest level of downloads of programs, music, films and radio and television content. Men are in a majority in this group, at 57.2%. Group 2 is the balanced entertainment profile so-called because the components' usage of all forms of entertainment is more or less homogenous; it numbers 19.8% of the students and most are men, 58.3%. Its distinctive feature is the high level of buying and selling that takes place, as well as the preference for online gaming.

Group 3 is the passive entertainment profile which accounts for 47.8% of students, and these have the lowest level of Internet use for entertainment. They tend to be the oldest in the sample and are mainly women, 61.5%. The low level of technology use for entertainment points to a student who does not deem online entertainment to be important, or who has restricted access to technology or no time to use it.
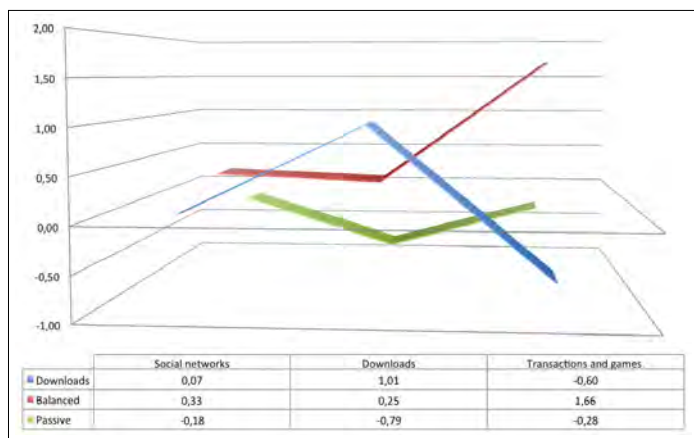

Figure 2. Groups according to use of technology for academic activities.

3.2. Educational uses of the Internet and academic achievement

One of the hypotheses tested in this research is that Internet use for doing coursework has a positive effect on academic achievement. The use of technology for carrying out educational tasks is grouped according to profile denomination that reveals the differences between them. The main divergence is between the dedicated profile and information seeker profile, which is apparent in the level of interaction activities and the work carried out with educational material; this is high in the dedicated profile and very low in the information seeker profile.

The likelihood ratio of failing one subject as opposed to failing none diminishes 1.53 (1/0.65) times when the student belongs to the dedicated student profile in relation to the information seeker academic profile. The likelihood ratio of failing one subject as opposed to failing none increases 1.37 times when the student belongs to the passive academic profile in relation to the information seeker academic profile. The likelihood ratio of failing two subjects against failing none is 1.45 (1/0.68) times less when the student belongs to the dedicated academic profile in relation to the information seeker academic profile, and is 1.48 times greater when the student belongs to the passive academic profile in relation to the information seeker academic profile. The likelihood ratio of failing three or more subjects against failing none is 1.33 (1/0.75) times less when the student belongs to the dedicated academic profile in relation to the information seeker academic profile, and is 2.01 times greater when the student belongs to the passive academic profile in relation to the information seeker academic profile.

3.3. Entertainment and academic achievement

The second hypothesis sustains that the use of Internet for entertainment activities influences students' academic performance. An important finding in our study is that students who use Internet for entertainment purposes less tend to fail more often (table 4). The likelihood of failing one subject as opposed

to failing none is 1.78 (1/0.55) times less when a student belongs to the download entertainment profile in relation to the passive profile; and is 1.29 (1/0.77) times less when the student belongs to the balanced entertainment profile in relation to the passive profile.

Something similar occurs when we analyze students who failed two subjects. The probability of failing two subjects in relation to failing none is 1.64 times less when the student belongs to the download entertainment profile in relation to the passive profile; and is 1.51 times less when the student belongs to the complete entertainment profile in relation to the passive profile.

4. Discussion and conclusions

Although the use of technology to perform academic activities determines only 3% of academic performance its effect is visible, depending on the type of usage. Students who tend to interact more and use educational material (dedicated profile) are less likely to fail than students whose main academic activity is to search for information (information seeker profile). These findings differ from those of Chen & Fu (2009) who sustained that searching for information on Internet enhanced academic achievement. The differences between the dedicated and information seeker profiles and their effect on academic achievement coincide with hypotheses that state that the digital divide is not solely due to Internet connection or access to technology (Warschauer, 2002; Zillien & Hargittai, 2009) but also to good use of technology and resources, as is the case of the dedicated profilers who present habits that are considered proper and balanced.

The passive profile has the lowest levels of technological use, which presumes that the student is conditioned by restrictions (income, knowledge, access to a connection); and the negative effect on academic achievement is clear since those whose use of the Internet tools for coursework is minimal (passive profile) tend to fail more subjects than those whose output

Table 3. Regression model coefficients									
Failed subjects[a]		B	Std. Error	Wald	df	Sig.	Exp(B)	95% Confidence Interval for Exp(B)	
								Lower Bound	Upper Bound
Failed 1	Intercept	-.670	.060	123.550	1	.000			
	[cluster 3 academic=1]	-.427	.086	24.738	1	.000	.653	.552	.772
	[cluster 3 academic=2]	.319	.088	13.146	1	.000	1.376	1.158	1.635
	[cluster 3 academic=3]	0[b]	.	.	0	.	.	.	.
Failed 2	Intercept	-1.294	.076	292.825	1	.000			
	[cluster 3 academic=1]	-.375	.108	12.155	1	.000	.687	.556	.848
	[cluster 3 academic=2]	.393	.108	13.336	1	.000	1.482	1.200	1.830
	[cluster 3 academic=3]	0[b]	.	.	0	.	.	.	.
Failed 3 or more	Intercept	-2.019	.102	388.468	1	.000			
	[cluster 3 academic=1]	-.286	.144	3.935	1	.047	.751	.566	.997
	[cluster 3 academic=2]	.698	.136	26.260	1	.000	2.010	1.539	2.625
	[cluster 3 academic=3]	0[b]	.	.	0	.	.	.	.

a. The reference category is: Failed 0.
b. This parameter is set to zero because it is redundant.

is based on online information searching (information seeker profile). The lack of access to the Internet has an

Table 4. Regression model coefficients								95% Confidence Interval for Exp(B)	
Failed subjects[a]		B	Std. Error	Wald	df	Sig.	Exp(B)	Lower Bound	Upper Bound
Failed 1	Intercept	-.493	.050	95.963	1	.000			
	[cluster 3 entertainment=1]	-.587	.082	50.665	1	.000	.556	.473	.654
	[cluster 3 entertainment=2]	-.261	.093	7.820	1	.005	.771	.642	.925
	[cluster 3 entertainment=3]	0[b]	.	.	0	.	.	.	.
Failed 2	Intercept	-1.072	.061	304.806	1	.000			
	[cluster 3 entertainment=1]	-.495	.100	24.428	1	.000	.610	.501	.742
	[cluster 3 entertainment=2]	-.414	.120	11.845	1	.001	.661	.523	.837
	[cluster 3 entertainment=3]	0[b]	.	.	0	.	.	.	.
Failed 3 or more	Intercept	-1.586	.075	444.524	1	.000			
	[cluster 3 entertainment=1]	-.722	.133	29.633	1	.000	.486	.374	.630
	[cluster 3 entertainment=2]	-.440	.150	8.589	1	.003	.644	.480	.864
	[cluster 3 entertainment=3]	0[b]	.	.	0	.	.	.	.

a. The reference category is: Failed 0.
b. This parameter is set to zero because it is redundant.

even greater negative impact than bad practices or habits in technology use. It also emphasizes the disadvantage suffered by those with fewer economic resources, thereby reinforcing the knowledge gap theory (Tichenor, Donohue, & Olien, 1970).

This study shows that students have greater academic success when they make a balanced use of Internet tools for their coursework; they more often get involved in interactive academic activities and make greater use of educational material, which fits with Castaño (2011) who showed the positive effects of interaction. On the other hand, students whose use of the Internet is categorized as passive score lower in testing.

Our study found that the influence of Internet use on academic achievement was significant, in line with Mishra & al. (2014) and Türel and Toraman (2015). Further research needs to focus on the time spent on the Internet for academic purposes in order to measure the true extent of this relation, so it should look to the most influential variables from our study, such as those related to interaction and working with educational material.

A significant percentage (30%) of students use Internet only for information searching and not for interacting with teachers or colleagues or using course material. This seems to be a strange behavior and further research is needed to determine whether it is an inappropriate practice or a new ad hoc methodology that is becoming a dynamic structure in students' technological practices. The use of the Internet for academic work is not influenced by gender, as both men and women present the same patterns for technology use.

In terms of entertainment-related activities, we found that the Internet use for entertainment had a positive influence on academic achievement, contrary to Ip & al. (2008). The reason is unclear so more data is needed on the time students spend on each entertainment activity. In general, students who download files and use the Internet extensively for entertainment purposes tend to fail fewer subjects than those who do not use the Internet, or rarely use it, for entertainment.

Regardless of whether students fail one, two or more subjects, the download profilers make more extensive use of the Internet for entertainment purposes. These students are less likely to fail than those who belong to the complete profile, whose level of technology use for entertainment is high and balanced. Although data on this finding are not abundantly clear, analysis of the similarities and differences between the two profiles reveals that the biggest divergence relates to the extent of buying and selling activities, and online gaming, with the latter perhaps being the most significant (Ip & al., 2008), which is why we extracted the percentage of students who play online in each profile, with download profilers playing less online (53.3%) than the complete profilers (87.7%). This could explain why the complete profile students have lower academic achievement. Although this finding is interesting, it requires more conclusive evidence. Future research needs to work on more variables, one such being the time students spend on online gaming.

Our finding, that students who use technology for entertainment generally tend to score higher in tests, runs contrary to several studies (Frangos & al., 2010; Ip & al., 2008; Mishra & al., 2014; Pepe, 2011; Türel & Toraman, 2015). Data supporting this finding is minimal, other than the fact that the level of influence of entertainment on academic achievement is 1.9% of the explained variance.

When comparing students who perform a wide range of online entertainment activities (balanced profile) to those whose use is limited (passive profile), women are twice as likely to belong to the latter group. In other words, women tend to make less use of technology for entertainment. On the other hand, comparing balanced profilers to downloaders, both men and

women are equally represented and no clear trend is visible. We can conclude that in terms of entertainment women prefer to download information than play games online.

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Cyberbullying: Social Competence, Motivation and Peer Relationships

Cyberbullying: competencia social, motivación y relaciones entre iguales

iD Dr. Eva M. Romera is Senior Lecturer in the Department of Psychology at University of Cordoba (Spain) (eva.romera@uco.es) (http://orcid.org/ 0000-0002-9414-8019)

iD Juan-Jesús Cano is PhD Candidate in the Department of Psychology at University of Cordoba (Spain) (m82caflj@uco.es) (http://orcid.org/ 0000-0003-4048-4815)

iD Dr. Cristina-M. García-Fernández is Lecturer in the Department of Developmental and Educational Psychology at University of Seville (Spain) (cgarcia19@us.es) (http://orcid.org/0000-0002-7088-7028)

iD Dr. Rosario Ortega-Ruiz is Full Professor of Psychology in the Department of Psychology at the University of Cordoba (Spain) (ortegaruiz@uco.es) (http://orcid.org/0000-0003-2110-6931)

ABSTRACT

The recognition of some overlap between face to face harassment (bullying) and via digital harassment (cyberbullying) could indicate that variables of social cognition, whose influence has been identified in bullying, also are present in cyberbullying. The aim of this research was to determine the social adjustment of roles involved in cyberbullying and to analyze the differences in the perception of social competence, social goals and peer support, between victims, aggressors and bully-victims of cyberbullying. A number of 505 teenagers (47.3% girls) between 12 and 16 years old (M=13.95, SD=1.42) participated in the study. Validated instruments for Spanish teenagers were used and psychometric properties for the adaptation of the scale of social competence were analyzed. Exploratory and confirmatory factor analysis showed optimal scores of reliability and validity. The cyber-bullying victims showed greater involvement in cyberbullying. Comparisons between roles with nonparametric tests showed that cyberbullies had the highest levels of peer support and popularity social goals. Cybervictims were highlighted by a high perception of social competence. Cyberbully-victims were described by their high popularity goals and low peer acceptance. These results support the conclusion that the way in which the peer group manages its emotional and social life may be explaining the situation of cyberbullying among teenagers.

RESUMEN

El reconocimiento de cierto solapamiento entre el acoso cara a cara (bullying) y el ciberacoso (cyberbullying) puede indicar que variables de cognición social, cuya influencia ha sido reconocida en el bullying, también estén presentes en el acoso cibernético. El objetivo de la investigación fue estudiar el ajuste social de los implicados en cyberbullying y analizar las diferencias en la percepción de la competencia social, la motivación y el apoyo de los iguales, entre víctimas, agresores y agresores victimizados del cyberbullying. Un total de 505 adolescentes (47,3% chicas) con edades comprendidas entre los 12 y 16 años (M=13.95; DT=1.42) participaron en el estudio. Se utilizaron instrumentos para adolescentes validados en español y se analizaron las propiedades psicométricas para la adaptación de la escala de competencia social. Análisis factoriales exploratorios y confirmatorios mostraron índices óptimos de fiabilidad y validez. Se observó una mayor implicación de los ciberagresores victimizados. Las comparaciones entre roles a través de pruebas no paramétricas mostraron en los ciberagresores un mayor apoyo social que el resto de perfiles y altos niveles en metas de popularidad. Las cibervíctimas destacaron por su alta percepción de competencia social. Los ciberagresores victimizados mostraron altos niveles de metas de popularidad y baja aceptación social. Los resultados obtenidos permiten concluir que la forma en que el grupo de iguales gestiona su vida emocional y social puede estar explicando la situación de cyberbullying entre los adolescentes.

KEYWORDS | PALABRAS CLAVE

Adolescence, social competence, risk behaviors, educational context, research, social motivation, popularity, social relationships.
Adolescencia, competencia social, conductas de riesgo, contexto educativo, investigación, motivación social, popularidad, relaciones sociales.

1. Introduction and background

As teenagers spend more and more time together, the peer context becomes increasingly important in their social lives. The technological revolution, especially communication via digital devices and social networks, has given rise to a fluid and almost permanent exchange that is often far removed from the adult world. It has been widely recognized that feelings of group belonging, reciprocity, social competence or peer acceptance are linked to psychological, social and emotional well-being during adolescence (Buhrmester, 1990; Parker & Asher, 1993).

The work of Vaughn and colleagues has shown that competent social behavior, social motivation and peer acceptance constitute a multifaceted and hierarchically organized construct that explains social adjustment in peer groups (Bost, Vaughn, Washington, Cielinski, & Bradbard, 1998; Vaughn & al., 2009). Social adjustment is defined as the degree to which an individual engages in socially competent behaviors that provide a good fit between their behavior and their immediate social context (Crick & Dodge, 1994).

Perceived social competence is the cognitive estimation of one's skills, abilities and behaviors that enable positive development outcomes (Zhang & al., 2014). As regards bullying, it has been shown that victims have a deficit in social skills (Fox & Boulton, 2005). In contrast, bullies have been characterized as having a low level of emotional skill in managing their relationships effectively, but have also been recognized to be popular and skilled in manipulating social situations to their own advantage (Gini, Pozzoli, & Hauser, 2011). Bully-victims, on the other hand, are those that exhibit the worst social and emotional skills (Habashy-Hussein, 2013).

Social motivation refers to the cognitive representation of what people want to attain, and marks the direction, effort and persistence required to achieve the desired behavior (Austin & Vancouver, 1996). Ryan and Shim (2006, 2008) have identified three types of goals: development goals, social demonstration or popularity goals and avoidance goals. The pursuit of development goals in adolescents has been associated with learning new ways of relating, personal growth and enhanced social outcomes, which contribute to social efficacy and greater acceptance from peers (Mouratidis & Sideridis, 2009; Ryan & Shim, 2006, 2008). However, adolescents may also be driven by the pursuit of goals whose aim is to achieve popularity, social success and higher status within the group. Several studies have highlighted that boys and girls who seek social recognition are more likely to

engage in aggressive behaviors (Ojanen, Grönroos, & Salmivalli, 2005; Rodkin, Ryan, Jamison, & Wilson, 2013). Finally, it has been shown that trying to avoid negative judgments from others often leads to a lack of acceptance by peers (Ryan & Shim, 2006), with victims of bullying exhibiting greater fear of negative evaluations (Storch, Brassard, & Masia-Warner, 2003).

Social acceptance, a third indicator of social adjustment, refers to the degree to which students are accepted or rejected by their peers. It involves engaging in positive interactions, spending time with others and having someone that provides support and well-being. There is general agreement in the research literature that the lack of acceptance by peers can lead to victimization (Kendrick, Jutengren, & Stattin, 2012). Although victims and bully-victims who suffer bullying report less social support from peers (Cerezo, Sánchez, Ruiz, & Arense, 2015; Holt & Espelage, 2007), it has also been shown that many boys and girls who are not accepted by their peers use aggression as a behavioral strategy in social interaction (Crick, Grotpeter, & Bigbee, 2002). However, social support has been recognized in bullies, because certain peer groups or contexts constituted on the basis of immoral norms accept aggression as a way to gain acceptance within the group (Berger & Caravita, 2016).

1.1. Social adjustment in cyberbullying

The technological advances in recent decades have changed social interactions from face-to-face to virtual exchanges. While this increased connectivity provides some social benefits for the virtual relationships of adolescents, such relationships are not without risks, including cyberbullying (Fernández-Montalvo, Peñalva, & Irazabal, 2015).

Research on cyberbullying has described this phenomenon as an indirect form of traditional bullying which shares the defining characteristics of intimidation: an intentional, aggressive act carried out against a victim by one or more perpetrators repeatedly and over time, causing an imbalance of power (Olweus, 1999). However, when this phenomenon occurs via the Internet or other digital communication devices, it exhibits specific characteristics, such as anonymity, publicity, which extends or may extend the damage caused to a wider audience, and the difficulty of disconnecting from the cyber environment, which can increase the vulnerability of the victims (Juvonen & Gross, 2008; Olweus, 2012; Smith, 2015).

The fact that cyberbullying shares the defining characteristics of bullying has led many researchers to study the similarities and differences between the phe-

nomena. Early research gave greater attention to the individual characteristics of the personality of the adolescents involved (Tani, Greenman, Schneider, & Fregoso, 2003). Subsequent studies, however, have taken into account both personal and contextual factors, finding that empathy and the social climate in which students operate are closely interrelated in both types of aggression (Casas, Del-Rey, & Ortega-Ruiz, 2013). In fact, it has been recognized that there is an overlap between those involved in traditional bullying and cyberbullying in terms of both victimization and aggression (Del-Rey, Elipe, & Ortega-Ruiz, 2012; Kowalski, Morgan, & Limber, 2012), in addition to similar negative consequences associated with both phenomena (Garaigordobil, 2011; Zych, Ortega-Ruiz, & Del-Rey, 2015). This has led to the recognition that cyberbullying occurs in a social environment where social relations are the same in online and offline networks (Ellison, Steinfield, & Lampe, 2007). It has also been shown that students most often begin bullying over the Internet, thus suggesting that the cyberspace may be a possible extension of the school setting (Juvonen & Gross, 2008).

Since bullying and cyberbullying tend to share the same social space, the variables of interaction that define bullying involvement should also extend to cyberbullying. Recent research on the social characteristics of those involved in cyberbullying has focused on the study of peer acceptance within the group (García-Fernández, Romera, & Ortega-Ruiz, 2015). In this regard, a low level of peer support has been shown to be related to cybervictimization (Ortega-Barón, Buelga, & Cava, 2016; Navarro, Yubero, & Larrañaga, 2015) and cyberaggression (Calvete, Orue, Estévez, Villardón, & Padilla, 2010). Similarly, it has been observed that a lack of peer support and cybervictimization are associated with subsequent online aggression, which could explain the role of peer support in the involvement of bully-victims (Wright & Li, 2013).

However, little research has been done on the role that social motivation, perceived social competence and perceived peer support play in cyberbullying

involvement by bullies, victims, bully-victims and those not involved in the phenomenon. Determining the social adjustment of those involved in cyberbullying could provide important insight for carrying out interventions in the school setting.

This paper has two objectives: a) to determine the social adjustment of those involved in cyberbullying and b) to analyze the differences in perceived social competence, social motivation and peer support between the roles involved.

We hypothesize that bullies will be motivated by popularity goals and show greater peer support, while

> Given the complex social structure of peer group involvement, teachers and school counselors should have more precise models to help them to organize groupings, social activities and analyze peer networks, among others, in order to prevent such phenomena from occurring and improve social motivation and interpersonal relationships among their students. In doing so, virtual social networks will also benefit, given the close relationship between bullying and cyberbullying.

bully-victims will show lower levels of social adjustment in all its dimensions.

2. Material and method
2.1. Participants

A total of 505 adolescents aged 12 to 16 participated in the study ($M=14.49$; $SD=7.66$), of which 47.3% were girls. Incidental non-probability sampling was performed. The sample of schools was selected according to their accessibility. The participants attended two public schools with an average socioeconomic level, one of which was located in a rural area.

2.2. Instruments

The Social Support Scale for Children developed by Harter in 1985 was used (Spanish version adapted for adolescents by Pastor, Quiles, & Pamies, 2012) ($\alpha=.69$). Each of the six items of the scale captures two social profiles (e.g., «Some kids have classmates

who like them the way they are BUT other kids have classmates who wish they were different»), with two response options each («Really true for me» or «Sort of true for me»). Respondents are asked to choose which profile best describes them and once they have chosen the profile they are asked to select one of the two options. The internal consistency of the scale with the study sample was $\Omega=.75$.

Social motivation was measured using the Spanish adaptation of the Social Achievement Goals Scale (Herrera-López, Romera, Gómez-Ortiz, & Ortega-Ruiz, 2016) designed and validated by Ryan and Shim (2006). This scale measures three types of social goals: development goals ($\Omega MD=.78$) (e.g., «In general, I strive to develop my interpersonal skills»); popularity goals ($\Omega MA=.89$) (e.g., «I want to be friends with 'popular' people»); and avoidance goals ($\Omega ME=.77$) (e.g., «I would be successful if I could avoid being socially awkward»). The scale comprises a total of 12 items that are measured on a 5-point Likert-type scale (1= Not at all true and 5=Very true). The internal consistency with the study sample was adequate ($\Omega MD=.82$, $\Omega MA=.85$, $\Omega ME=.75$).

Self-perceived social competence was measured using the Perceived Social Competence Scale II (Anderson-Butcher, Amorose, Riley, Gibson, & Ruch, 2014). This scale assesses the perception of social self-competence by means of five items (e.g., «I show concern for others» or «I give support to others»). Responses are measured on a 5-point Likert scale (1=Not at all true and 5=Really true). To date, no studies have used this scale with Spanish teenagers. The results of the validation of the Spanish adaptation of the scale are presented in the results section. The internal consistency with the study sample was adequate ($\Omega=.91$).

The European Intervention Project Cyberbullying Questionnaire (Del-Rey & al., 2015) was used to measure two dimensions of cyberbullying: cybervictimization ($\alpha=.97$) (e.g., «Someone said nasty things to me or called me names using texts or online messages» or «Someone posted embarrassing videos or pictures of me online») and cyberaggression ($\alpha=.93$) (e.g., «I created a fake account, pretending to be some else» or «I excluded or ignored someone in a social networking site or Internet chat room»). The questionnaire consists of 22 Likert items with five response options: 0=No; 1=Yes, once or twice; 2=Yes, once or twice a month; 3=Yes, about once a week; and 4=Yes, more than once a week. The internal consistency for the study sample was adequate for cybervictimization ($\Omega=.95$) and cyberaggression ($\Omega=.97$).

2.3. Procedure

After selecting the schools, pupils were informed of the research aims and asked to participate in the study. Authorization was obtained from the schools and the families. Emphasis was placed on the voluntary nature of their participation and the confidentiality of their responses.

The instruments were administered to the classes as a whole in their respective classrooms without the presence of teachers in a single, 30-minute session.

2.4. Data analysis

To determine the psychometric properties of the Perceived Social Competence Scale in adolescents, confirmatory factor analysis (CFA) was performed using the robust maximum likelihood method. The following fit indices were used: the Satorra-Bentler chi-square ($2S$-B), the comparative fit index (CFI) ($>.95$), the non-normed fit index (NNFI) ($>.95$), the goodness-of-fit index (GFI) ($>.95$), the root mean square error of approximation (RMSEA) ($<.08$) and the standardized root mean square residual (SRMR) ($<.08$) (Byrne, 2006; Hu & Bentler, 1999). EQS 6.2 software was used to perform the analyses. To calculate involvement in the cyberbullying roles, the criterion of Del-Rey & al. (2015) was taken into account.

To study the mean differences in involvement in the cyberbullying roles, nonparametric tests were used (Kruskal-Wallis and Mann-Whitney U tests for pairwise comparisons) after verifying the lack of normality by the Kolmogorov-Smirnov test. The data were coded and analysed using SPSS statistical software version 20. Given the ordinal characteristics of the variables, internal consistency was analyzed based on the results of McDonald's omega (Elosua Oliden & Zumbo, 2008), which was calculated using the Factor 9.3 program.

3. Analysis and results

The descriptive analyses of the sample indicate a 29.7% incidence of cyberbullying. Of the total respondents, 9.9% were victims, 5.5% were bullies and around 14.3% were bully-victims. No statistically significant differences regarding involvement in each of the roles were observed for the gender variable.

The results of the CFA for the Perceived Social Competence Scale in adolescents were optimal (figure 1): $\chi 2S$-$B=13.96$; $p=.01$; NNFI=.971; CFI=.985; RMSEA=.059; SRMR=.27. The values of the covariances between items ranged from .46 to .71. The value of Mardia's multivariate coefficient was 30.63. The univariate statistics for each item are presented in table 1.

Table 1. Univariate statistics for the Perceived Social Competence Scale II				
	M	SD	Kurtosis	Skewness
I help other people	4.31	0.884	1.926	-1.389
I ask others if I can be of help	4.01	1.018	0.835	-1.058
I show concern for others	4.11	0.964	0.959	-1.086
I show care for others	4.06	0.976	0.786	-0.992
I give support to others	4.18	0.913	1.332	-1.156

The Kruskal-Wallis H test showed statistically significant differences between the different cyberbullying roles in all the social adjustment variables (table 2). Post hoc analyses with pairwise comparisons using the Mann-Whitney U test showed that cybervictims were less accepted by their peers compared to those not involved in cyberbullying (p<.001), cyberbullies (p<.01) and cyberbully-victims (p=.027), while cyberbully-victims showed less peer acceptance than those not involved in cyberbullying (p=.021). As regards social development goals, those not involved showed a higher level of social competence compared to the cyberbullies (p=.047) and the cyberbully-victims (p=.017). In terms of social demonstration goals, cybervictims displayed fewer popularity goals than cyberbullies (p=.045) and cyberbully-victims (p<.001). However, the group not involved in cyberbullying exhibited fewer popularity goals than the cyberbully-victims (p<.01). As for self-perceived social competence, the group of cyberbullies showed lower levels than those not involved (p<.01) and cybervictims (p<.01). Moreover, cyberbully-victims showed lower self-perceived social competence compared with the cybervictims (p=.017) and those not involved (p=.040).

4. Discussion and conclusions

The purpose of this research was to determine the social adjustment of adolescents involved in cyberbullying through the analysis of perceived peer support, social competence and social goals, and to examine differences according to the cyberbullying role. We hypothesized that cyberbullies would exhibit greater popularity goals and peer support than cybervictims and that cyberbully-victims would show lower social adjustment in all the dimensions.

Research on the prevalence of cyberbullying has yielded different results in terms of the percentages of involvement, often due to the heterogeneity of the measurement processes (Modecki, Minchin, Harbaugh, Guerra, & Runions, 2014). In this study, we used an instrument that has been validated in a broad European sample and captures the defining characteristics of cyberbullying

(Del-Rey & al., 2015), thus permitting the results to be compared with other studies that have used the same instrument. Our results show that one out of every four students is involved in cyberbullying, with more young people involved in the role of cyberbully-victim (Del-Rey & al., 2015; Selkie, Fales, & Moreno, in press). In line with previous studies, we did not observe gender differences (Hinduja & Patchin, 2009). However, the results on gender differences in cyberbullying are unclear and it seems that they may be moderated by age (see the meta-analysis of Barlett & Coyne, 2014). As regards social adjustment, our study found that cyberbullies report the highest mean perceived social support, even compared to those who are not involved in cyberbullying. In this sense, our study differs from some studies (Calvete & al., 2010; Katzer, Fetchenhauer, & Belschak, 2009) which have reported that bullies are characterized by their low peer support, but is consistent with others which have shown that bullies are more popular and socially accepted than victims and as popular and socially accepted as those who are not involved (Berger & Caravita, 2016). As expected, cybervictims reported the lowest mean perceived peer support, which is consistent with studies that indicate that cybervictims have fewer friends and the support of friends protects against cyberbullying (Kendrick & al., 2012; Kowalski, Giumetti, Schroeder, & Lattanner, 2014; Navarro & al., 2015). The relationship between low peer support and cybervictimization can be explained, on the one hand, by the face-to-face context in which bullying occurs, and on the other, by the strong relationship between bullying and cyberbullying. If cyberbullies choose their cybervictims from
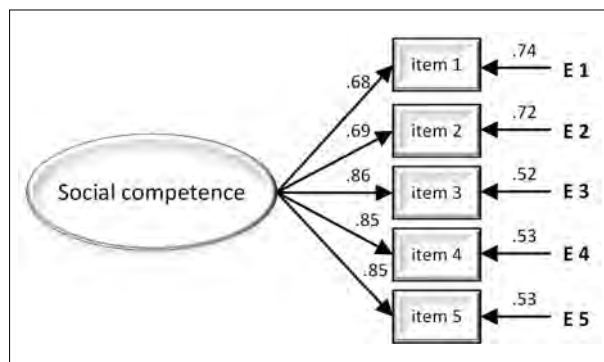
Figure 1. CFA for the Perceived Social Competence Scale (Anderson-Butcher & al., 2014)

Table 2. Differences between social adjustment indices and cyberbullying roles									
Variable/Roles	**Statistics**			**Differences between groups**		**Pairwise comparisons**			
	N	M	SD	X(gl)	p			U	p
Peer acceptance									
Not involved	341	3.12	.522			NI/V		5257.000	.000
Victim	49	2.76	.614			NI/B		3895.00	.692
Bully	24	3.18	.463	21.943(3)	.000	NI/BV		9557.500	.021
Bully-victim	68	2.99	.506			V/B		343.000	.004
Total						V/BV		1267.000	.027
	482	3.07	.538			B/BV		634.000	.104
Social development goals									
Not involved	352	4.01	.676			NI/V		7628.500	.125
Victim	50	3.89	.632			NI/B		3669.500	.047
Bully	27	3.79	.605	9.839(3)	.020	NI/BV		10429.000	.017
Bully-victim	72	3.87	.560			V/B		606.500	.461
Total						V/BV		1730.500	.715
	501	3.97	.654			B/BV		915.500	.655
Demonstration goals (popularity)									
Not involved	352	2.38	.995			NI/V		7744.000	.168
Victim	50	2.19	1.017			NI/B		3977.000	.156
Bully	27	2.63	.976	13.472(3)	.004	NI/BV		9907.000	.003
Bully-victim	72	2.72	.931			V/B		488.500	.045
Total						V/BV		1186.000	.001
	501	2.42	.995			B/BV		926.500	.719
Social avoidance goals									
Not involved	352	3.11	1.019			NI/V		8706.500	.903
Victim	50	3.16	.924			NI/B		4196.500	.310
Bully	27	3.30	.958	1.511(3)	.680	NI/BV		12134.000	.569
Bully-victim	72	3.05	.947			V/B		599.000	.416
Total						V/BV		1710.000	.638
	501	3.12	.995			B/BV		819.500	.229
Perceived social competence									
Not involved	352	4.19	.759			NI/V		7762.000	.173
Victim	50	4.29	.787			NI/B		3133.500	.003
Bully	27	3.72	.849	15.026(3)	.002	NI/BV		10743.500	.040
Bully-victim	72	3.96	.892			V/B		390.000	.002
Total						V/BV		1344.500	.017
	501	4.14	.796			B/BV		785.000	.140

Note: NI=Not involved; V=Victim; B=Bully; BV=Bully-victim

among socially vulnerable boys and girls who are more socially isolated and already immersed in a process of face-to-face victimization and hence less able to defend themselves, such social defenselessness could be a prior risk factor for cyberaggression. The low peer support perceived by cyberbully-victims may have the same explanation since, to a large degree, cyberbully-victims have similar functional characteristics to those of cybervictims. The lack of peer support and cybervictimization may intensify negative feelings, which in turn increases the risk of cyberbullying. This is in line with previous studies, which have shown that peer rejection may be a source of tension that contributes to cyberbullying (Hinduja & Patchin, 2009; Wright & Li, 2013).

Although there is little research on social development goals in relation to cyberbullying roles, we know that when adolescents pursue social development goals, they find new ways of relating, enhance their relationships and take the initiative to meet others, make friends and learn to get along with others, all of which are related to lower peer rejection (Mouratidis & Sideridis, 2009; Ryan & Shim, 2006, 2008). In this paper, those who were not involved in bullying reported higher levels in the social development goal variables, while cyberbullies showed lower scores, thus confirming that cyberbullies are characterized by low levels of positive social motivation or development.

As regards the pursuit of popularity, cyberbully-victims and cyberbullies were most driven by the need to be socially recognized. These results are consistent with those found for bullying, thus suggesting that the desire to attain social recognition leads many boys and girls to intimidate others. It should be noted, however, that cyberbullies do not harass others at random, but do so in order to strengthen their social position or marginalize opponents in a group (Navarro & al., 2015), which has important moral implications regar-

ding the impact of bullying and cyberbullying on the ethics of students involved in these phenomena.

Finally, cyberbullies display lower levels of perceived social competence, whereas cybervictims show the highest. This social profile underscores the close relationship between cyberbullying and traditional or face-to-face bullying. As in traditional bullying, cyberbullying is targeted at victims who, despite engaging in prosocial behaviors, being perceived as socially competent and striving to improve their relationships with others (development goals), are vulnerable and rejected within the group. It is therefore not their social skills that characterize them, but the position or social status they acquire according to the conventions and sometimes arbitrary norms established within the peer group context, which may explain their victimization. This suggests that prosociality and the ability to interact with others does not protect victims from being the target of bullies. Rather, cyberbullies recognize their lack of social efficacy and low level of development goals and yet are popular and recognized by others (which does not necessarily mean that they are loved or liked). Hence, there is a cyberbully profile that seeks popularity within the peer group and has a high level of peer acceptance; two features that characterize this false leadership within the group. Such morally vacuous leadership should be considered morally negative.

These findings should aid in guiding psychoeducational interventions, teaching practices, curriculum design and actions to promote peaceful coexistence in secondary schools. Given the complex social structure of peer group involvement, teachers and school counselors should have more precise models to help them to organize groupings, social activities and analyze peer networks, among others, in order to prevent such phenomena from occurring and improve social motivation and interpersonal relationships among their students. In doing so, virtual social networks will also benefit, given the close relationship between bullying and cyberbullying.

The conclusions of this study indicate that greater attention must be paid to the configuration, social motives and socio-emotional connotations of the peer group and its influence on the management of social life and school life. Indeed, many of the keys for explaining the situations of dominance and submission that occur in cyberspace between boys and girls may be found in the conventions and social motives that arise in the context of both direct and virtual peer networks.

This study has some limitations, among them the sample size. Increasing the number of participating schools as well as the study area would allow us to reach conclusions that more closely reflect the social and virtual reality of adolescents. Measuring the variables by means of self-reports is also limiting because they may lead to some degree of social desirability bias. It would therefore be necessary to include the perceptions of other groups (peers or teachers) to assess social adjustment, as well as to obtain qualitative data on the perspective of victims and bullies. As a future line of research, longitudinal explanatory models of social adjustment in cyberbullying which measure the attitudes and behaviors of the reference peer group towards cyberbullying should be considered.

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Gender Stereotypes 2.0:
Self-representations of Adolescents on
Facebook

Estereotipos de género 2.0: Auto-representaciones de adolescentes en Facebook

Dr. Ursula Oberst is Associate Professor in the Blanquerna Faculty of Psychology, Educational Sciences and Sports, Ramon Llull University in Barcelona (Spain) (ursulao@blanquerna.url.edu) (http://orcid.org/0000-0002-4735-782X)

Dr. Andrés Chamarro is Fellow Professor in the Department of Basic, Developmental and Educational Psychology at the Autonomous University of Barcelona (Spain) (andres.chamarro@uab.es) (http://orcid.org/0000-0002-8059-5467)

Dr. Vanessa Renau is Research Fellow in the Blanquerna Faculty of Psychology, Educational Sciences and Sports at the Ramon Llull University in Barcelona (Spain) (vanessarr@blanquerna.url.edu) http://orcid.org/0000-0002-6242-8710)

ABSTRACT

Adolescent girls and boys use online networking sites differently, and girls have a higher risk of being harmed by non-adaptive use. The aim of the study was to assess the extent to which adolescents portray themselves according to gender stereotypes on their Facebook profiles. Participants were 623 Facebook users of both sexes who responded to the Bem Sex Role Inventory (BSRI) and the Personal Well-being Index (PWI). In the first step, the adolescents responded to the BSRI with respect to how they view a typical adult in terms of gender stereotypes. In the second step, half of them responded to the BSRI with respect to how they view themselves and the other half responded with respect to their self-presentation on Facebook. The results show that adolescents consider themselves to be less sexually differentiated than a typical adult of their own sex, both in their self-perception and their self-portrayal on Facebook. The study confirms that the psychological well-being of girls decreases considerably with age and that it is associated with a greater degree of masculinity. We conclude that adolescents produce accurate self-representations on their Facebook profiles, and both boys and girls tend to offer a less sexually differentiated self-concept and self-portrayal than that of the typical adult, with a slight preference for masculine traits; moreover, masculinity is associated with a greater degree of psychological well-being.

RESUMEN

Chicas y chicos adolescentes hacen un uso diferente de las redes sociales online, y las chicas presentan un mayor riesgo de verse perjudicadas por un uso no adaptativo. El objetivo de este estudio era investigar en qué medida los adolescentes se presentan en términos de estereotipos de género en sus perfiles de Facebook. Los participantes, 623 usuarios de Facebook de ambos sexos, contestaron el Bem Sex Role Inventory (BSRI) y el Personal Well-being Index (PWI). En la primera fase, respondieron sobre cómo ven a un adulto típico en términos de estereotipos de género. En la segunda fase, la mitad de ellos contestó el BSRI en relación a cómo se ven a sí mismos, y la otra mitad cómo se presentan en Facebook. Los resultados muestran que los adolescentes se consideran más sexualmente indiferenciados que un adulto típico de su mismo sexo, tanto en su auto-percepción como en su presentación en Facebook. Se confirma que el bienestar psicológico de las chicas baja considerablemente con la edad, y que está asociado a un mayor grado de masculinidad. Se concluye que los adolescentes producen representaciones verdaderas en sus perfiles de Facebook, y que existe una tendencia hacia una auto-concepción y auto-presentación más sexualmente indiferenciada con una leve preferencia por rasgos masculinos, tanto en chicos como en chicas; además, la masculinidad está asociada a un mayor grado de bienestar psicológico.

KEYWORDS | PALABRAS CLAVE

Social networking sites, Facebook, adolescents, gender roles, gender stereotypes, masculinity, femininity, psychological well-being.
Redes sociales online, Facebook, adolescentes, roles de género, estereotipos de género, masculinidad, feminidad, bienestar psicológico.

1. Introduction
1.1. Psychological correlates of the use of the Internet and its applications

The development of the Internet and its application has led to an exponential increase in two-way communication channels. While oral communication has remained practically unchanged, written communication has undergone a revolution, especially through social networking sites (SNS) (Carbonell & Oberst, 2015). These means of communication are increasingly present in our daily lives and although their use is expanding throughout the population, they are especially popular among teens and young adults. SNSs offer a new information format and a new communication channel. Through registering and creating a profile, users can display aspects of their identity and connect with other users, interacting in a number of ways (such as through comments, links, photos, videos, and internal chats). Despite rumors about its possible decline and disappearance (Cannarella & Spechler, 2014), Facebook, with 1,59 billion users in 2015 (Statista, 2015), is still the most popular and most used platform in the world and also in Spain (17 million users). Age of initiation to Facebook is dropping, and in general SNSs have replaced email and instant messaging as the principal focus of teens' online activity (Garcia, López-de-Ayala, & Catalina, 2013). It is to be expected that the widespread introduction of a means of communication would impact the habits and psychological structure of users, especially among the youngest ones. This mode of communication tends to begin in adolescence, the developmental stage in which young people construct their identities through contact with their peers.

The first studies on the use of the Internet and online social networks showed a negative effect of computer-mediated communication on the psychological health of teens and young adults, a phenomenon called the Internet Paradox (Kraut & al., 1998). Further research brought nuance to this finding (Kraut & al., 2002), as results showed that these new forms of communication could also have positive effects on psychological adjustment because they allow young people to expand their social networks and satisfy their need for affiliation and self-disclosure (Spies-Shapiro & Margolin, 2014). Only 5% of teens say that the use of social networks makes them feel depressed and only 4% say that it has had a negative effect on their relationship with friends. In contrast, 10% report that using them makes them feel less depressed and 52% say that they have helped them maintain or improve their relationships (Rideout, 2012). Nevertheless, since online

social networking through Facebook, Instagram, Twitter or text messaging services has become one of the main activities of teens, studies have shown that overuse or maladaptive use of these technologies has negative effects on the well-being and psychological functioning of children and adolescents (Kross & al., 2013; Sampasa-Kanyinga & Lewis, 2015) and on their academic achievement (Kalpidou, Costin, & Morris, 2011).

The use of online social networking has been identified as a potential mental health problem (Kuss & Griffiths, 2011). Recent studies suggest that negative effects depend on how young people use the technology, on certain specific practices and on the reactions of others, for example, on whether their peers offer positive or negative feedback on their profiles (Valkenburg, Peter, & Schouten, 2006). Having many Facebook friends is associated with greater subjective well-being and with presenting a positive –and honest– image of oneself (Kim & Lee, 2011). In contrast, young people with the highest levels of falsification on their profiles have fewer social abilities, lower self-esteem, higher social anxiety and higher levels of aggression (Harman, Hansen, Cochran, & Lindsey, 2005).

An important issue of interest in research on SNS is what people disclose on these sites and how they present themselves (impression management). The degree to which social network users disclose information in their interactions depends on various factors, especially on the relationship between interlocutors (Nguyen, Bin & Campbell, 2012). Gendered presentation refers to the different patterns of males and females in their online self-presentations. Taking this as a starting point, the aim of the present study was to assess adolescents' perception of traditional gender roles and their self-perception and self-presentation on Facebook with respect to masculinity and femininity. Taking the Facebook profile as a strategic presentation of one's ideal self, we wanted to learn whether adolescents continue to present themselves in terms of traditional gender roles and to assess whether more intense Facebook use or higher gender typicality in one's Facebook self-presentation correlates with lower psychological well-being.

1.2. Gender differences in the use of ICTs and SNSs

Gender is an important factor in considering the possible negative consequences of the problematic use of ICTs. Multiple studies of computer-mediated communication reveal important sex differences related to

the use of Internet and new technologies in general. For two major Internet applications linked to abuse, pornography and online video games, most of the people with addictions are men. In other applications and technologies, the gender ratio is more balanced, although there are gender differences in how people use the technologies. For example, men use mobile phones primarily for work, logistical matters and entertainment, while women use them primarily for establishing and maintaining social relationships (Beranuy, Oberst, Carbonell, & Chamarro, 2009).

Studies of social networks and gender show that men's and women's patterns of behavior are also reproduced in this means of communication. The different motives in men and women for using online social networks are parallel to their motives for using the Internet (Bond, 2009). Young women use these pages mainly for communication and self-presentation (Barker, 2009), while men mainly use them for pragmatic reasons or entertainment (Haferkamp, Eimler, Papadakis, & Kruck, 2012). Women are also more likely than men to express emotions on these applications; to self-disclose; to post more images of themselves, friends and significant others; and to change their profile pictures more often (Strano, 2008). In contrast, men are more likely to present themselves as strong, powerful, independent and having high status. According to some authors (Magnuson & Dundes, 2008), both men and women adopt self-presentations that conform to traditional codes of masculinity and femininity. According to these norms, men have been considered more instrumental and less emotional, and women have been considered more expressive. Women's online self-portrayals may also lead to self-objectification (de-Vries & Peter, 2013). Most authors conclude that Facebook helps identity construction while also maintaining traditional gender stereotypes (Linne, 2014). More women than men also appear to suffer from the inappropriate use of Facebook. Women are more likely to indicate that they lose sleep because of their Facebook activity, that their activity causes them stress, that images on FB cause negative self body image, and that they feel addicted (Thompson & Lougheed, 2012).

1.3. Gender stereotypes

The construction of gender identity is an ongoing process, which begins in early childhood. The influence of family members, peers and the media converge to impact young people's self-concept (Lieper & Friedman, 2007). The process culminates in adolescence, when gender role identification is more pronounced (Galambos, Almeida, & Petersen, 1990).

> The aim of the present study was to assess adolescents' perception of traditional gender roles and their self-perception and self-presentation on Facebook with respect to masculinity and femininity. Taking the Facebook profile as a strategic presentation of one's ideal self, we wanted to learn whether adolescents continue to present themselves in terms of traditional gender roles and to assess whether more intense Facebook use or higher gender typicality in one's Facebook self-presentation correlates with lower psychological well-being.

Unlike the biological category «sex», the term «gender» is understood and explained through social role theory (Eagly, 1987) as a social construction that emerges through a process of ongoing learning related to behaviors, perceptions and expectations that define what it means to be a man or a woman. Gender stereotypes are composed of a series of characteristics associated with women or men (López-Zafra, García-Retamero, Diekman, & Eagly, 2008). In this sense, gender roles are not simply descriptive or explanatory categories (López-Sáez, Morales, & Lisbona, 2008); rather, they are also prescriptive and they refer to what an individual perceives about how others expect him or her to behave. Therefore, men and women are subject to different normative expectations, and those factors can lead to gender differences in behavior.

Studies demonstrate that men are expected to be more agentic (task-oriented, assertive, controlling,

independent and unemotional), and that women are expected to be more communicative and oriented towards interpersonal relationships (Guadagno, Muscanell, Okdie, Burk, & Ward, 2011). Nonetheless, typically masculine and typically feminine traits –that is, masculinity and femininity– have changed in recent decades, and traditional masculine and feminine roles are losing importance (Holt & Ellis, 1998; López-Zafra & al., 2008; (Martínez-Sánchez, Navarro-Olivas, & Yubero-Jiménez, 2009).

However, while women now tend to assign themselves traits considered typically masculine, adopting an androgynous self-perception, men do not do the same with feminine traits (López-Sáez & al., 2008). It seems that typically feminine characteristics are less socially desirable, while masculine traits are more socially desirable. Therefore, girls want to display more masculinity while boys do not want to display more femininity. It has also been observed that the internalization of gender stereotypes is more ingrained in adolescent boys than in adolescent girls (Colás & Villaciervos, 2007).

Gender and gender roles have important psychological correlates. While in earlier studies conduct congruent with one's own gender was considered to be psychologically adaptive (Whitley & Bernard, 1985; Williams & D'Alessandro, 1994), later studies showed that either masculinity (Woo & Oei, 2006) or androgyny (high masculinity and high femininity) correlates positively to psychological adjustment (Williams & D'Alessandro, 1994). However, the results of other studies are not consistent with this finding (Woodhill & Samuels, 2003). Moreover, neither masculinity nor femininity presents itself as uniformly positive. In a study performed with adult participants, masculinity predicted less depression but more antisocial problems and substance use (Lengua & Stormshak, 2000).

Traditional gender stereotypes are generated and maintained by social structure and an individual will conform or not to them depending on the response that he or she receives. Back & al. (2010) emphasize the fact that online social networks integrate several sources of personal information that act as a mirror of the different environments of the person, such as private thoughts, facial images, and social conduct (both their own and those of others). In this sense, the person receives and generates different displays depending on and in accordance with the peer group. Bailey, Steeves, Burkell, & Regan (2013) have argued that SNSs represent an environment of elevated public surveillance, which makes both girls and boys present themselves more in accordance with gender norms than what they would do in face-to-face contexts.

Social context shapes identity, including gender identity. And because stereotypes are a fundamental element of gender identity, it follows that Internet social networks also influence it. From the perspective of gender, the necessity of presenting oneself in a certain way may be different for girls and for boys. It is possible that gender stereotypes play a more important role in girls' virtual self-presentation than in their self-presentation in face-to-face social contexts, and this may increase their psychological discomfort. One study found that girls on Facebook wanted to be nicer, sexier, stronger and more objective, while boys didn't desire any change (Renau, Carbonell, & Oberst, 2012). Gender roles and stereotypes have a fundamental role in gender identity and in shaping the personality of pre-teens and teens, and SNSs have great relevance today in the identity formation of young people (Linne, 2014). For these reasons we wanted to investigate the presence of gender stereotypes on these networks and their implications for psychological well-being.

We established the following hypotheses:

• H1: As outlined before, earlier studies have shown a decrease in self-attributed gender stereotypes (Martínez-Sánchez, Navarro-Olivas, & Yubero-Jiménez, 2009). Therefore we expected participants to present themselves as less masculine or feminine than their perception of a typical male or female.

• H2: It has also been shown (Ruble & Martin, 1998) that teens' awareness of gender roles increases with age. Therefore, we expected the participants to perceive the typical adult as increasingly more stereotyped, and we also expected their self-perception scores to increase in gender typicality.

• H3: Previous studies have shown that Facebook profiles accurately represent the personality of their users and do not display self-idealization (Back & al., 2010; Gosling, Augustine, Vazire, Holtzman, & Gaddis, 2011). Therefore, we expected adolescents' online self-presentations to be likewise accurate in terms of gender stereotypes, i.e. there should be no difference between the scores based on self-perception and those based on self-presentation in their Facebook profiles.

• H4: As found in earlier studies (Spies Shapiro & Margolin, 2014), we expected girls to make more use of FB and have more FB friends, and also to show less psychological well-being than boys.

• H5: According to studies on gender roles (e.g. Woo & Oei, 2006), masculinity in online profiles

should have a positive association with psychological well-being, whereas femininity should not.

2. Method
2.1. Participants

The participants were 623 secondary school students (331 females) aged between 12 and 16 (1st to 4th year of ESO, which are the first four years of Spanish compulsory secondary schooling), from different Spanish schools in the region of Catalonia. All participants had a personal Facebook profile under their real identity (table 1).

Table 1. Number of boys and girls in each grade				
	1ºESO (1st year)	2ºESO (2nd year)	3ºESO (3rd year)	4ºESO (4th year)	total
Boys	33	55	115	89	292
Girls	29	64	118	120	331

2.2. Instruments

Number of Facebook friends and frequency of Facebook use: participants were asked to indicate the number of Facebook friends they had as well as their frequency of FB connection, using a five-point Likert scale from 1 (once a month) to 5 (several times a day).

Sex roles: the Spanish adaptation of the Bem Sex Roles Inventory (BSRI, Páez & Fernández, 2004) was used to assess sex role stereotypes. This version of the scale consists of 18 items (adjectives or short expressions, such as «sensitive to others' needs»), with nine in each of two dimensions corresponding to the stereotypes of masculinity and femininity in a Likert-type scale from 1 (never) to 7 (always). The BSRI offers the possibility for respondents to rate masculinity and femininity of a «typical male» and a «typical female», and then to rate the respondents self-perception of his or her gender typicality. For the «typical male», Cronbach's α's were =.812 for masculinity, and .817 for femininity; for the «typical female», Cronbach's α's were =.733 for masculinity, and .788 for femininity.

Personal well-being: the Spanish adaptation of the Personal Well-Being Index Scale (PWI; Casas & al., 2011) was used. The scale consists of seven items on a Likert scale from 1 (no satisfaction at all) to 10 (completely satisfied),

each item asking for the respondent's satisfaction in a different area in life (e.g. health, personal relationships, etc.) and yielding an overall score of personal well-being. In this study, Cronbach's reliability index was α=.75.

2.3. Procedure

The study was approved by the funding institution and the Institutional Research Committee of the Ramon Llull University. Informed consent from school authorities and parents was obtained. Participants answered the questionnaires in a paper-and-pencil format within a classroom context. In the first step, all participants replied to the BSRI, indicating scores for what they considered to be a typical male (TM) and a typical female (TF). In a second step, half of each class answered the questionnaires in reference to themselves (condition SELF), and the other half opened their Facebook profiles on their personal computers and assessed their own profiles (condition FB) with respect to the BSRI. Finally, in the last step, all students answered the PWI.

2.4. Data analysis

The subscales for masculinity (mas) and femininity (fem) were calculated for the respondents' perception of a typical male and a typical female (thus obtaining masTM, femTM, masTF, femTF), as well as for themselves, either in the SELF or in the FB condition (obtaining masRES, femRES). Two paired-sample t-tests were run for boys and for girls to assess the difference between the participants' perception of themselves and a typical adult (typical female in the case of girls and typical male in the case of boys). To test the effects of gender, grade, and condition on number of Facebook friends, frequency of Facebook use, psychological well-being, masTM, femTM, masTF, femTF, masRES, femRES, a 2x4x2 MANOVA was run. Correlations between the dependent variables were calculated. As indicator of effect size, the eta-

Table 2. Means and standard deviations for the dependent variables, with respect to condition and gender				
	Condition SELF		Condition FB	
	Males	Females	Males	Females
	M (SD)	M (SD)	M (SD)	M (SD)
Nº of Facebook friends	410(338.69)	550(428.64)	454.66(420.34)	512.53(287.97)
Connection time	3.64 (1.32)	3.88(1.24)	3.51(1.38)	4.06 (1.02)
Psychological well-being	56.78 (8.75)	54.88 (8.83)	56.61(7.52)	54.33 (8.61)
Masculinity typical same-sex adult	38.89 (8.15)	34.38 (7.69)	40.16 (8.55)	32.84 (7.16)
Femininity typical same-sex adult	33.66 (7.65)	48.47 (6.67)	32.33 (8.07)	47.06 (7.15)
Masculinity respondent	34.30 (8.96)	32.67 (8.30)	32.41 (8.38)	27.68 (8.75)
Femininity respondent	34.09 (7.13)	39.98 (6.71)	32.80 (8.76)	38.92 (8.97)

square (ἠ2) coefficients were calculated. All data analyses were effectuated with the Statistical Package for the Social Sciences SPSS version 22.

3. Results

The descriptive statistics are set out in table 2.

3.1. Results of self-presentation with respect to typical adult

Compared to their perception of a typical male, boys scored themselves as lower with respect to masculinity (t=10.718, p=.000, df=274), with respect to the typical female, girls rated themselves as lower both for masculinity (t= 7.705, p=.000, df=314) and for femininity (t=19.318, p=.000, df=318).

3.2. Effects of gender, grade and condition on the dependent variables

The results of the 2x4x2 MANOVA are shown in table 3. For the main effects, as expected, girls show higher scores in femininity, while boys rate higher in masculinity. Girls also have more Facebook friends and rate the typical female's masculinity and femininity as higher than boys do. As for the effects of grade, the number of Facebook friends and connection time increases. Additionally, the participants' perception of a typical female's masculinity increases with age. For the combined effect of gender and grade, it is noteworthy that the girls' femininity as well as their well-being decreases with age. There was no effect of the interaction of gender*condition or grade*condition, and for the interaction of all three sources there was only an effect for well-being. The finding of no combined effects for condition with respect to the respondents' masculinity and femininity indicates that there is no difference in self-perception and self-presentation on Facebook. Therefore, for subsequent analysis, the scores of both conditions were taken together.

3.3. Correlations

Psychological well-being correlated positively with masculinity (r=.142, p<.01). Both masculinity and femininity also correlated with number of Facebook friends (r=.119, and r=.138, respectively, both with

Table 3.Results of the 2x4x2 MANOVA				
Source	Variable	F	p	ἠ
Gender				
	Facebook friends	4.421	.036	.008
	Connection time	3.389	.066	.006
	Psychological well-being	1.947	.164	.004
	MasTM	1.804	.180	.003
	FemTM	3.650	.057	.007
	MasTF	9.516	.002	.018
	FemTF	8.356	.004	.016
	mas RES	18.073	.000	.035
	fem RES	82.588	.000	.136
Grade				
	Facebook friends	8.846	.000	.048
	Connection time	2.760	.042	.015
	Psychological well-being	1.804	.145	.010
	MasTM	2.203	.087	.012
	FemTM	.976	.404	.006
	MasTF	3.991	.008	.022
	FemTF	.718	.541	.004
	mas RES	2.135	.095	.012
	fem RES	1.242	.294	.007
Gender x grade				
	Psychological well-being	3.356	.016	.019
	fem RES	3.557	.016	.019
Gender x grade x condition				
	Psychological well-being	2.274	.008	.022

Note. As there were no significant effects for condition, the corresponding section is omitted to save space. For the same reason, in the combined effects (gender x grade; gender x grade x condition), only the significant results are given.

p<.01), while frequency of Facebook connection showed a correlation with femininity (r=.133, p<.01).

3.4. Additional analyses

To explore the reasons for the girls' decreasing well-being, an additional MANOVA for gender and grade with respect to the individual items of the PWI was run. For the interaction, there were significant effects, i.e. a decrease in satisfaction in girls with respect to their health (F=3.580, p=.014, ἠ2=.017), to their feeling of safety (F=2.797, p=.039, ἠ2=.013), to their group relationships (F=4.010, p=.008, ἠ2=.019, and to their future (F=3.252, p=.021, ἠ2=.016).

4. Discussion

In this study we assessed the degree to which adolescents continue to define themselves in terms of gender stereotypes and whether their online self-presentation differs from their face-to-face self-presentation. Our results show that adolescents are aware of traditional gender stereotypes, but that they view themselves in a less stereotyped and more sexually undifferentiated way than their perception of a typical adult of their sex. These findings confirm our first hypothesis and are in line with other studies that show a change

in traditional gender stereotypes among Spanish adolescents (García-Retamero, Müller, & López-Zafra, 2011; García-Vega, Robledo-Menéndez, García-Fernández, & Rico-Fernández, 2010). However, girls continue to have higher femininity scores than boys and vice versa, as found in other studies (López-Sáez & al., 2008). While García-Vega & al. (2010) found that a majority of adolescents characterized themselves as androgynous (high masculinity, high femininity), in our study there is a tendency toward a more undifferentiated profile (low masculinity, low femininity), especially for females.

The second hypothesis is partially confirmed: Participants' perception of a typical adult also varies with sex and age: as adolescents grow older, they perceive a typical female (but not a typical male) as having more masculine attributes, i.e. it is confirmed that gender role typification increases during adolescence (Galambos, Almeida, & Petersen, 1990). Girls have a more androgynous view of a typical female than boys (higher masculinity and higher femininity). However, the girls' own femininity decreases with age. These results suggest a tendency of girls to endorse less feminine and more masculine attributes for themselves as future adults, both in self-perception and in online self-presentation.

With respect to hypothesis 3, our results also confirm earlier findings that people present an accurate image of themselves on SNSs. The fact that there was no condition effect leads us to the conclusion that adolescents' self-presentation on their Facebook profiles does not differ from their self-perception. This finding indicates that the participants perform honest self-presentation not only with respect to personality (Back & al., 2010), but also with respect to other dimensions related to personal attributes. We conclude that adolescents not only consider themselves to be more sexually undifferentiated with respect to gender typicality, but also want to be seen as such (Kapidzic & Herring, 2011).

Finally, the well-established finding of girls' decreasing well-being has also been confirmed in our study, and this seems to be related to increasing concerns about their health, safety, relationships, and future (hypothesis 4). Well-being correlated positively with masculinity, whereas femininity showed no influence, a finding that confirms hypothesis 5. Thus, perceiving oneself as having more masculine (desirable?) traits is a source of well-being. The case of femininity is not so clear. It has been argued (Renau & al., 2012) that high femininity has a negative effect, i.e. a more feminine self-presentation on Facebook is related to less psycho-logical well-being. In our study, as girls grow older they score lower in femininity but nevertheless their well-being scores also decrease.

5. Conclusions

Our results confirm tendencies in gender role changes described in earlier studies and extend these results to online profile self-presentations. Teens show congruency between their face-to-face self-perception and how they want to be seen by others online. Traditional gender stereotypes seem to blur; both sexes offer self-presentations on Facebook that are less masculine and less feminine than what they perceive to be typical people of their own sex. Our results reveal a sex difference in this area, as females' self-presentation is even less feminine than males' self-presentation is masculine. Also, traditional masculine attributes are more related to well-being and boys score higher for both well-being and the masculinity of their self-presentations.

Social media such as Facebook produce more opportunities for social comparison than face-to-face contexts, and thus impression management is an important aspect of online representations. SNSs foster self-promotion and narcissistic self-representation (Mehdizadeh, 2010), in addition to a need for popularity (Christofides, Muise, & Desmarais, 2009). Girls achieve these self-portrayals by strategically selecting their profile pictures (Krämer & Winter, 2008) and by displaying attractiveness (Manago & al., 2008), familial relations and emotional expressions (Tifferet & Vilnai-Yavetz, 2014).

The profile that people make public on an Internet social network acts like a mirror —a mirror that we ourselves manage— and with it we design our self-presentation (Gonzales & Hancock, 2010). Social comparison is another mechanism, since when we find ourselves in an ambiguous situation, we turn to the immediate environment for the information that we need; for example, the behavior of others. Social comparison is inevitable on online social networks. In fact, according to some authors, it is one of the reasons why users maintain profiles on such networks, because doing so helps to shape personality (Manago, Graham, Greenfield, & Salimkhan, 2008). Each time we open our profile we encounter an image of what we are projecting about ourselves, which becomes a reminder and a reaffirmation of what we are (Gonzales & Hancock, 2010). Future studies of SNSs and gender should bear this in mind. Institutional efforts, such as educational programs for promoting safer use of Facebook among adolescents in school settings (Van-

derhoven, Schellens, & Valcke, 2014), should also teach adolescents about what to disclose on their profiles and how to present themselves in order to prevent possible harmful effects.

6. Limitations

This study presents some limitations. Gender stereotypes depend to a great extent on the cultural context and therefore sampling was restricted to Catalonia in order to achieve a culturally homogeneous sample. However, this might be a limitation for the generalizability of the results.

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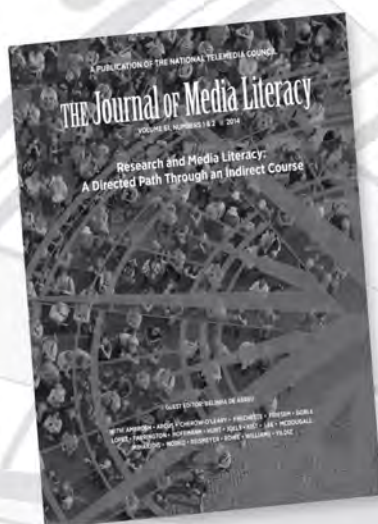
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Youth and the Third Sector Media in Spain: Communication and Social Change Training

Jóvenes y tercer sector de medios en España: Formación en comunicación y cambio social

🆔 Isabel Lema-Blanco is Researcher in the People-Environment Research Group, Faculty of Educational Sciences at the University of A Coruña (Spain) (isabel.lema@udc.es) (http://orcid.org/0000- 0003-2965-8052)

🆔 Eduardo-Francisco Rodríguez-Gómez is Researcher in the Department of Journalism and Audiovisual Communication at the University Carlos III of Madrid (Spain) (edrodrig@hum.uc3m.es) (http://orcid.org/0000-0002-1788-2412)

🆔 Dr. Alejandro Barranquero-Carretero is Professor in the Department of Journalism and Audiovisual Communication at the University Carlos III of Madrid (Spain) (abarranq@hum.uc3m.es) (http://orcid.org/0000-0002-9264-9389)

ABSTRACT

The aim of this paper is to examine the role of community, free and university media in Spain as tools for media literacy and as instruments for creating a more critical and communicative citizenry. After a conceptual section, we analyse training processes in this area with regard to the general population and their reference communities, devoting particular emphasis to the involvement of young people. The triangulation research method was based on quantitative (a survey) and qualitative (focus groups) techniques. The results show that the third sector media in Spain act as invaluable tools for the acquisition of skills and competences that are transferable into young people's professional and experiential sphere, given the ability of these media outlets to identify with their interests, aspirations and difficulties. In a broad sense, these initiatives contribute to expanding the right of communication in two different ways: on the one hand, because they are open to citizen participation in both management responsibilities and content programming; and, on the other, because their decentralized practices provide a laboratory for creative journalism which, in turn, is linked to social movements and other means of expression for citizens (NGOs, associations, etc.).

RESUMEN

El siguiente trabajo tiene por objeto acercarse al papel de los medios comunitarios, libres y universitarios del Estado español como instrumentos para la alfabetización mediática y en tanto que espacios para la conformación de ciudadanía crítica y comunicativa. Tras el apartado conceptual, se analizan los procesos de aprendizaje que se implementan con respecto a la ciudadanía en general y a las comunidades de referencia en particular, prestando especial atención al rol y a la participación de la juventud. A partir de la triangulación de técnicas cuantitativas (encuesta) y cualitativas (grupos de discusión), los resultados demuestran que los medios del tercer sector actúan como valiosas herramientas para la adquisición de habilidades y competencias críticas que pueden transferirse a la esfera profesional y vivencial de los jóvenes, dada la identificación de estos medios con los intereses, problemáticas y aspiraciones juveniles. En un sentido amplio, estas iniciativas contribuyen a la expansión del derecho a la comunicación en dos direcciones: por un lado, porque están abiertas a la participación ciudadana en las tareas de gestión y programación de los contenidos; y, por otro, porque sus prácticas descentralizadas constituyen un laboratorio de creatividad periodística que, a su vez, está vinculado al devenir de los movimientos sociales y otras formaciones de la ciudadanía organizada (ONG, asociaciones, etc.).

KEYWORDS | PALABRAS CLAVE

Community media, community radio stations, third sector, media literacy, media training, non-formal education, social learning, long-lasting learning.

Medios comunitarios, radios comunitarias, tercer sector, alfabetización mediática, educomunicación, educación no formal, aprendizaje social, aprendizaje permanente.

1. Introduction and state of affairs

The aim of this paper is to examine the role that community, free and university media[1] play as teaching and learning entities for citizens in general and youth in particular. This role seems to have been reinforced recently by the shaping of new synergies with organized civil society, which encounters in third sector communication a vital ally for its struggles. Furthermore, these initiatives grow, to a large extent, with the progressive and innovative use of low-cost digital technologies (webs, social networks, blogs, etc.), which make information, participation and organization on the web easier, as seen in the anti-globalization movements in the early years of the twenty-first century or the so-called «take the square movements» arising in 2011 –15M, Arab Spring, «Occupy», etc.– (Cammaerts, Mattoni, & McCurdy, 2013; Gerbaudo, 2012). A correlate to this latest wave of social outbursts, the communication third sector is a booming media system compared to the public and private/commercial media pairing (Barranquero & Meda, 2014). Unlike the above, its management is in the hands of non-profit-making organizations, associations and social movements which appropriate technologies and media within their reach (Rodríguez, 2009) in order to make their voice heard (Couldry, 2010) and obtain symbolic recognition in the public sphere (Fraser, 2003). Its ultimate aim is to effectively achieve the «right to communication» (Hamelink & Hoffmann, 2008), which involves active participation by citizens in the various stages in the life of a communication project (both in programming content and day-to-day running or decision-making about editorial aims and values), and which is aimed at providing a public service in a predominantly local context (Brevini, 2014: 991).

Third sector media have a bearing on the achievement of social justice, participatory democracy and the promotion of pluralism and in this sense they have the recognition of the UN (La-Rue, 2010), the European Parliament (2008) and the Council of Europe (2009). Likewise, these projects are instances of media literacy (Lewis & Mitchell, 2014) and lifelong learning about what being a citizen means (Kejval, 2006), becoming genuine «communication schools», given that they contribute to the acquisition of a critical conscience on the communication system and they develop abilities to «be in a position to broadcast messages and operate in the media» (Kaplún, 1983: 43). However, and despite its long experience of more than sixty years in the North –Europe, USA, Canada, etc.– and in the South –South America, Asia, Africa– (Gumucio & Tufte, 2006), community media have had to wait until the beginning of the new millennium to break free from academic exclusion and become a legitimate object of study. Approaches to the subject have focused on the conceptualization and description of classic and contemporary experiences (Atton, 2015; Gumucio, & Tufte, 2006; Downing, 2010) and the study of the regulatory context (Atton, 2015; Meda, 2015, Milan, 2010). From a social educational perspective, its values for social cohesion (Lewis, 2008; Lewis & Mitchell, 2015), the inclusion of minorities and vulnerable groups (Correa, 2010; Contreras, González-Mairena, & Aguaded, 2014) and educommunication (Aguaded & Contreras, 2011; Contreras & al, 2014; Fedorov & Levitskaya, 2015) have been tackled.

In Spain, there is a long tradition of community media since the beginning of the transition to democracy, especially in the Autonomous Communities with a strong partnership tradition such as in Catalonia, Andalusia or the Basque Country (Meda, 2013). Since the early 80s there have also been media which define themselves as «free» and try to ensure their independence by rejecting any form of public or private funding (Pérez, 2012), whilst, in the first decade of the millennium, university broadcasting burst on to the scene which had as referents the third sector media, rather than public or commercial ones (Aguaded & Martín-Pena, 2013). The evolution of all these initiatives has been held back by a plethora of obstacles which have been to the detriment of their consolidation, especially in matters such as «frequencies, funding, public demand and political will» (Lewis, 2015: 6). In this sense, the General Law on Audiovisual Communication (LGCA, 2010) for the first time recognizes the existence of non-profit-making audiovisual and community services, but ignores university media and, to date, has not evolved specific regulations for the concession of licences and State promotion of the third sector. The absence of a regulatory framework for audiovisual media (radio and television) –digital ones act, for the time being, without such restrictions– goes against their economic and political sustainability and leaves them in an extraordinarily weak position compared to many of their European counterparts (Meda, 2013; Meda, 2015).

In an adverse and conflictive framework like the one described, the third sector has not ceased in its efforts to shape educommunicational spaces in which the hegemonic senses of social communication are being thrashed out (Kejval, 2006; Lucas, 2014; Scifo, 2009). If media literacy is understood as the learning obtained in, with and from the media and for the acquisition of media skills (Ferrés & Piscitelli, 2012),

the third sector fulfils an educational role, at least, on three levels. Firstly, it extends the right to communication by giving priority to citizen sources, agendas and approaches, a fact that flies in the face of the trend towards commercial exploitation of the news agenda which predominates in the corporate media[2] (Díaz-Nosty 2013; Nichols & McChesney, 2010). Secondly, these projects educate for participation in public life and contribute towards the extension of the right to citizenship, this latter understood, not as «a status that is granted or denied», but as a kind of political identity that is built when citizens set in motion «communication processes which contribute to shaping their local communities» (Rodríguez, 2009: 18-19). Thirdly, the alternative media presuppose a source of abilities and skills for both the critical reception of media messages and the creation of audiovisual products by communities themselves (Kaplún, 1983; Prieto & van de Pol, 2006). In turn, they provide technical, communication and social skills that boost confidence and motivation in the participants (Lewis & Mitchell, 2015) and raise the level of awareness about the power of the media as shapers of social reality. In all cases, it is essentially learning by doing, a long-lasting learning that is respectful of the subject's prior knowledge, that goes beyond the limits of traditional educational institutions and is based on cooperative and supportive processes of knowledge building.

In the field of educommunication in Spain, a collection of recent research has explored the integration of media skills in the curriculum of communication professionals (Buitrago, Ferrés, & García-Matilla, 2015; Tucho & al., 2015) or in the teaching sphere of disciplines such as communication and education (López-Romero & Aguaded, 2015), besides systematizing a set of dimensions and indicators for analysis (Ferrés & Piscitelli, 2012). However, and for the time being, progress towards configuring educational curricula within community media has been scant, something which is seen both in the European context (Lucas, 2014) and in the Spanish one. Nevertheless, the historic course of community media shows its educational capacity as informal areas of media training, besides being instigators of social learning via interest communities such as the case of networks around which the third sector is organized in Spain: the Network of Community Media-ReMC; the Association of University Radio Stations-ARU, the Association of Municipal and Citizen Radio and Television Stations of Andalusia-EMA-RTV, etc.

> The definition of people's media skills ought to have wide participation not just from the academic community, professionals and experts, but also from social organizations (NGOs, movements, etc.) and, in particular, from the communication third sector itself. This study shows the enormous educational possibilities of these media which, as yet at their consolidation stage, appear to be gaining ground on both academic agendas and communication policies of several European and Latin American states.

2. Material and methods

The study has combined quantitative and qualitative research methods (Denzin, 1978). In the first place, based on information on websites and previous listings (García-García, 2013), a census of 345 community, free and university media was drawn up for the whole of Spain, except La Rioja, Ceuta and Melilla, where no initiatives were found. Subsequently, the sample was compiled using an exploratory sample by quotas on the basis of strata of heterogeneity depending on the format of the medium (table 1), the Autonomous Community (table 2) and typology (university, community, free, etc.). Between February and May 2015 a digital survey was sent containing 35 questions divided into three blocks (identification of projects; organization, content and participation; and relationship to young people), from which 94 valid questionnaires were obtained. For a confidence level of 95% and assuming pq=50, a sample error of 8.6% was achieved. The results, which are shown in percentages, were analysed using «LibreOffice Calc» and «SPSS statistical software».

As a qualitative method, a focus group was used (Murillo & Mena, 2006) which looked into motivation, experience and perceived learning by young people in these media. A total of 28 people between 18 and 35 years of age –in accordance with the delimitation of youth by the Spanish Centre for Sociological Research (CIS)– took part in four discussion groups held in Andalusia (FG01: 7 persons), Madrid (FG02: 7 persons), the Basque Country (FG03: 10 persons) and Catalonia (FG04: 4 persons). By sector, the groups represented thirteen radio stations (two of them university ones), four press projects (print and digital) and two audiovisual production associations. All were audio and video recorded and transcribed literally.

Table 1. Proportion of the sample according to media format			
	Radio	Digital and Analogue Press	Television
Universe (345)	61%	35%	5%
Sample (94)	55%	34%	10%

Table 2. Proportion of the sample according to Autonomous Community							
	Andalusia	Madrid	Basque Country	Catalonia	Valencia	Galicia	Rest of Communities
Universe (345)	9%	13%	9%	36%	6%	3%	23%
Sample (92)	11%	17%	10%	27%	10%	3%	18%

The analysis of the data content was carried out manually following a descriptive coding method (given the exploratory nature of the focus groups) and an interpretative one (Miles & Huberman, 1994) focusing on the interactions between participants and their agreements/disagreements about the various topics. Besides the random procedure, the reliability criteria (Valles, 1997: 103-104) were reinforced by data triangulation (arising from the focus groups and the questionnaire) and peer review (the discussion groups were classified by at least two researchers).

3. Analysis and results
3.1. Motivation of youth sectors for taking part in the third sector

The participants in the focus groups clearly differentiated two reasons for taking part in a citizens' communication project: on the one hand, the desire to acquire professional skills and practical experience with regard to academic training and, on the other, their aspirations relating to voluntary work and social commitment. In the first case, they were young students and graduates in journalism, audiovisual communication and similar (e.g. Vocational Training), seeking an opportunity to acquire experience and freely develop their profession, without the usual restrictions found in commercial media: «I wanted to do things outside uni-

versity because I didn't get enough personal development there. When you see that you can do something more than what they have taught you and that it isn't complicated, you are keen to stay» (FG02_free radio Madrid).

In the second case, comprising a more numerous group, young people approach the media motivated by their interest in communicating content that reflects their interests and identities, not always represented in the agenda of conventional media: «My motivation is threefold: one, to make radio programmes, I don't care what they are about; two, to make radio programmes on specific topics, cinema, literature, etc.; and three, to belong to a group and make its information known» (FG01_community radio in Andalusia). An example of it are the frequent allusions to the new currents of opinion and demands to participate and the deliberative democracy that emerged after the mobilizations of 15M and neighbouring movements: Mareas, Platform for those Affected by Mortgages, etc.

However, the influence of these movements is not similar throughout the whole country nor constant over time, since the study shows a greater impact in areas such as Madrid and Catalonia. Despite the fact that its contribution to the revitalization of the third sector has not been uniform –only exceptionally such as the emergence of new radio stations (e.g. Ágora Sol) and digital media linked to 15M itself (Barranquero y Meda, 2014)–, the message has got through to young people, who highlight their role as sounding boards for social movements. In any event, the prior link is frequent (even before 15M) among youth and social groups of different kinds: «I took part in social movements in my neighbourhood and that's how I got to know about the radio station. I joined in 2007, I did a project on mental health, linked to my job (I'm a psychologist) and now it's my eighth year. Militancy in radio is across the board» (FG02_community radio in Madrid).

3.2. Training processes and acquisition of abilities and skills in communication

If earlier mention was made of the link between community media and young graduates in the communication field, it must be pointed out that this sector represents a minority of participants. The questionnai-

re shows that the majority of people who are involved in the sector do so without having prior professional training or experience, consequently their learning, almost always self-taught, arises from daily practice, knowledge exchange with more senior colleagues, and the training workshops themselves driven by some of these media. It must be stated that it is in the radio sector where a greater effort to set up formal media education can be seen, compared to sectors such as the press or television (figure 1).

The studio shows three basic types of training activities: workshops that teach how to produce, design and undertake a radio programme, both from a creative and a technical point of view; guidance for new members and programmes; and, to a lesser extent, external training actions which, besides making the medium known in its environment, offer a didactic or ludic service to the surrounding community. In larger community media and/or in ones with a longer history, and in particular in university broadcasters, training seems to be more systematic and there is a series of training programmes throughout the year. Media with fewer resources usually compensate the lack of standardized training with guidance processes, tutoring and peer to peer knowledge transfer. However, young people agree that practice itself involves the most effective learning, since, in their own words, it is best «to jump in at the deep end» and learn by your own mistakes: «We are completely self-taught. You join and you go to other people's programmes, you see how it is done, you learn and then you do it on your own» (FG03_community radio in the Basque Country). As far as training content is concerned (figure 1), those that stand out are teaching to do with the handling of technical equipment, ahead of production, voice and audiovisual content develop-
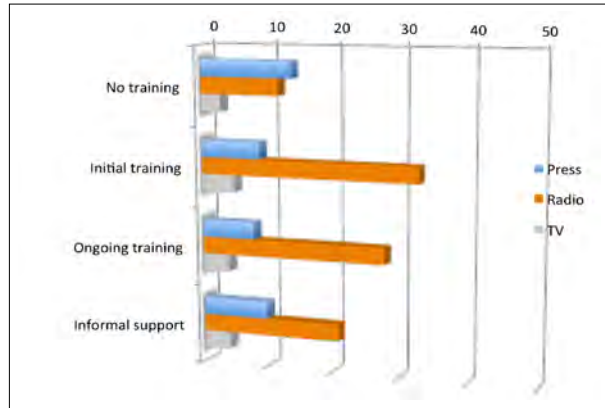
Figure 1. Type of training offered by the media.

ment, and, to a lesser extent, theory teaching about the philosophy of the third sector, legal matters or the right to communication.

A small percentage of media also offers training to people from outside, aimed at attracting new members or promoting participation in the nearby community: «At our workshops we teach understanding of how media works and how to cope in social networks. In fact, they are workshops for citizens in general» (FG-04_digital media in Catalonia). On the other hand, the study shows growing collaboration between the third sector and various public entities, in particular the education sector (figure 2) and usually secondary schools and universities. However, only 5% of the media polled have set up formal agreements with other institutions such as NGOs, civic associations or public administrations.

In general, young people highlight the acquisition of cooperative values and a sense of community: «Radio has given me a lot on all levels: personal, professional, cultural, etc. Although I would highlight the professional level, because I have discovered a way of doing journalism that I thought didn't exist and that was the one I was looking for» (FG02_community radio Madrid). It may be concluded that the training offered and the abilities acquired through taking part in community media give rise to three kinds of learning: a) cognitive or conceptual, linked to the acquisition of new knowledge about social communication and audiovisual production; b) attitudinal: perception of new values and attitudes arising from taking part in a social group; and c) procedural: relating to the development of social skills, the assumption of responsibilities and the acquisition of participatory methodologies such as team working methods, group dynamics, conflict management or decision-making in an organization.
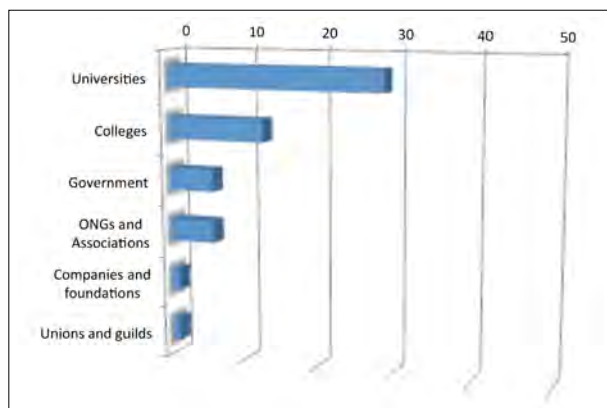

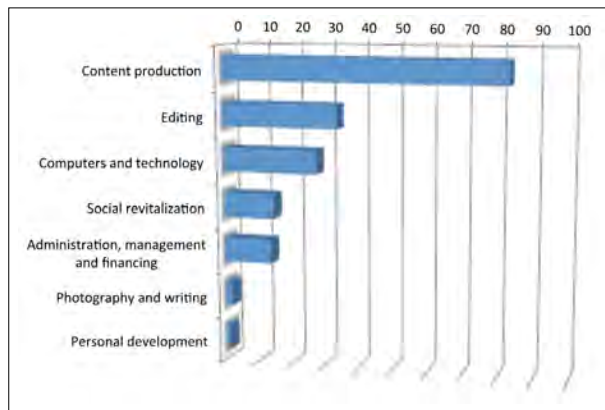Figure 2. Training agreements set up by the media..

Figure 3. Activities undertaken by young people

3.3. From developing specialized content to communication for social change

The study showed that young people mainly become involved in content development (including presenting programmes) and, to a lesser extent, in production tasks, editing and computing, participation in management and administration being scant (figure 3). Likewise, young people assign an important role to those actions that put them in contact with their reference community, «with people in the street», a heterogeneous context in which social movements and organized civic groups are permanently present as content creators in which they can «develop across the board their skills in management, dynamic agents for social groups or local development itself» (FG02_community radio in Madrid).

According to those interviewed, young people do not only work on content aimed specifically at youth, although it is common for them to address very specific interest groups (minority or specialist ones), to look at issues not usually present in the commercial media (alternative music, social and cultural issues, etc.) and to analyse the social and political context from a critical perspective and using innovative and creative formats. In this way, there are frequent allusions to the role of spokesperson that the media assume in relation to groups that are discriminated against in the media sector: «I've only been doing this three months and I can choose the topic I want, although the radio station encourages us to report about the neighbourhood, which is highly stigmatized. So we try to take people from around here, neighbourhood associations, small retailers, mainly lots of life stories» (FG01_community radio in Andalusia). Recognition by the community of the work that the media do reinforces the perception of their usefulness and effectiveness, feeding

back, at the same time, their social commitment to the group that manages the media: «In the cover of the last general strike, the unions and the pickets approached our microphones before they did those of SER radio station, because they knew that SER did not broadcast live. For us feedback is very encouraging, to know that people want to tell you their stories and that what we do has some worth, despite our not appearing in the General Study of the Media» (FG01_community radio in Galicia).

At the same time, young people have learnt to use social networks and Internet as means of boosting their communication activities, so they usually take on jobs like web enhancement, streaming and podcast production: «This year there are ten of us in the news office and we are still growing, a couple of weeks ago we started broadcasting on Saturdays. We also use social networks and we are extending a lot into Ivoox, Twitter and Facebook» (FG01_community radio in Andalusia).

As far as the responsibility for coordinating, training or sourcing funding, the associates and volunteers with most experience in the media –or people on secondment who are hired on a temporary basis– are the ones who take on these jobs. This is because of the low level of professionalism in the third sector in Spain, which has very few remunerated staff (figure 4) and low participation rates among young people (between 18 and 25 years of age).

Some of the most senior interviewees regret the fact that not all young people are interested in this type of project. In fact, in the Madrid and Vitoria groups there was evidence of the existence of consolidated, and sometimes endogamic, circles that distrusted the arrival of novice collaborators, regardless of the fact that in the philosophy of these media figures its open-
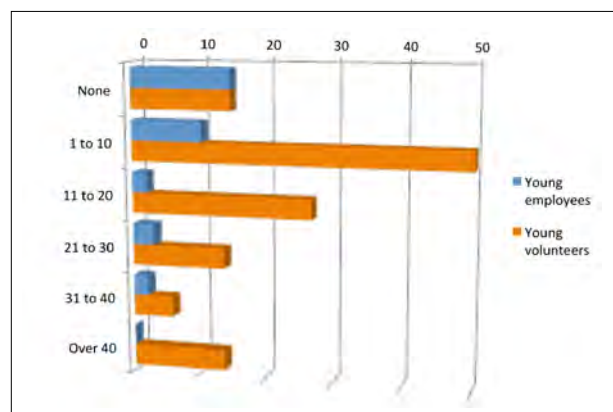

Figure 4. Percentage of media according to number of salaried young people and volunteers.

ness without barriers to citizen participation: «We veterans and administrators believe that our experience is valid for everyone and we tend to demand more or underrate the work of the people that come to make their programmes, pay the fee and go. But the truth is that it enables the rest of us to go on working. The involvement of others is achieved by time and experience» (FG04_ community radio in the Basque Country). Despite this, all the media show a clear disposition to favour horizontal decision-making processes via assemblies or working groups, differing from the hierarchical structures that characterize the public and commercial media: «That takes a lot, participation sometimes is a bit low because out of twenty people, only two turn up, although we are slowly making progress and are still in the running-in period» (FG01_ community radio in Andalusia).

4. Discussion and conclusions

This research has enabled progress to be made in the empirical understanding of the involvement of young people between 18 and 35 years of age in free, community and university media in Spain. The study analyses the motivation and the roles played by youth, as well as the teaching/learning processes that take place among them. It has been seen that young people take part in these projects driven by a desire to communicate alternative content in an environment of freedom and creativity, which contrasts with the disaffection they show towards the conventional media, as this and other studies reveal (Centro Reina sobre Adolescencia y Juventud, 2014). Likewise, young people approach these media not just because they find in them somewhere where they can direct their interests and demands, but also because they consider them to be an essential instrument for taking part in public life.

In spite of the scant financial resources, the lack of legal and institutional support and the situation of legal insecurity (Meda, 2015), third sector media (and very especially, radio and television stations) have managed to implement training schemes which transfer the skills required for active exercise of the right to communication and, in particular, for the acquisition of theoretical knowledge, technical skills (production, presenting, technical broadcasting) and the management of information technologies: social networks, websites, on-line broadcasts, etc. However, this study provides evidence of differences in the formulae with which different media undertake this educommunicative work: from those who have formal workshops for implementing various skills –the case of university radio stations and some community broadcasters (for example:

Unión de Radios Libres y Comunitarias de Madrid (The Free and Community Media Union)-URCM, Onda Merlín Comunitaria (OMC community radio) and Radio Vallekas in Madrid, CUAC FM in Corunna, etc.)-, to those who have no training programmes at all. These limitations may be made up for, in part, by strengthening the synergies with an educational community (primary, secondary, occupational training, universities) which, for the time being, have not been fully involved in the development of the sector.

Along with previous studies (Lewis, 2008), the results show that active participation in community media promotes the development of interpersonal, social and civic skills. However, Spanish alternative media must be more ambitious in instrumenting and planning their training programmes, as their European colleagues (Lucas, 2014; Scifo, 2009) and Latin American colleagues (Kevjal, 2006; Prieto & Van-de-Pool, 2006) have been doing. Likewise, it is advisable to target these plans at the acquisition of the knowledge and skills required to guarantee the social, political and financial sustainability of projects and, especially, skills for creating audiovisual content, coordinating and managing the media, and technological skills (Lema-Blanco, 2015). It is equally advisable that this learning should evolve from the current pragmatic approach to more holistic knowledge and one which relates to the role of the media as facilitators of empowerment and social change (Kaplún, 1983; Gumucio & Tufte, 2006) and theoretical issues concerning philosophy, mission and media values in the third sector. Furthermore, all this will contribute to the construction of a solid discourse for change, as a factor that contributes to the strengthening and institutional recognition of the sector (Lewis, 2014).

Finally, we agree with Fedorov and Levitskaya (2015) in that the definition of people's media skills ought to have wide participation not just from the academic community, professionals and experts, but also from social organizations (NGOs, movements, etc.) and, in particular, from the communication third sector itself. This study shows the enormous educational possibilities of these media which, as yet at their consolidation stage, appear to be gaining ground on both academic agendas (Barranquero & Rosique, 2014) and communication policies of several European and Latin American states (Meda, 2015).

Notes

[1] For reasons of style they have also been defined as community media or media belonging to the third sector, although the meaning of «third sector communication» implies a much wider variety of experiences, such as, for example, those related to the media prac-

tices of NGOs or the cyberactivism of many social movements.

[2] We define corporate media as those which belong to a large national or international media corporation and which, as profit making institutions, diversify their content and services in order to offer mainly news and entertainment.

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A Comparative Study of Handwriting and Computer Typing in Note-taking by University Students

Análisis comparativo entre escritura manual y electrónica en la toma de apuntes de estudiantes universitarios

Dr. Estíbaliz Aragón-Mendizábal is Associate Professor in the Department of Psychology at University of Cadiz (Spain) (estivaliz.aragon@uca.es) (http://orcid.org/0000-0002-0440-5705)

Dr. Cándida Delgado-Casas is Associate Professor in the Department of Psychology at University of Cadiz (Spain) (candida.delgado@uca.es) (http://orcid.org/0000-0003-1012-8676)

Dr. José-I. Navarro-Guzmán is Full Professor in the Department of Psychology at University of Cadiz (Spain) (jose.navarro@uca.es) (http://orcid.org/0000-0002-0738-2641)

Dr. Inmaculada Menacho-Jiménez is Assistant Professor in the Department of Psychology at University of Cadiz (Spain) (inmaculada.menacho@uca.es) (http://orcid.org/0000-0002-0337-0993)

Dr. Manuel-F. Romero-Oliva is Assistant Professor in the Department of Didactics of Language and Literature at University of Cadiz (Spain) (manuelfrancisco.romero@uca.es) (http://orcid.org/0000-0002-6854-0682)

ABSTRACT

Taking notes is a common strategy among higher education students, and has been found to affect their academic performance. Nowadays, however, the use of computers is replacing the traditional pencil-and-paper methodology. The present study aims to identify the advantages and disadvantages associated with the use of computer (typing) and pencil-and-paper (handwriting) for taking notes by college students. A total of 251 social and health science students participated in the study. Two experimental conditions were chosen: taking notes by hand (n=211), and taking notes by computer (n=40). Those that used computer-written notes performed better on tasks based on reproducing the alphabet, writing sentences, and recognizing words (p<.05). However, those using handwritten notes performed better on free recall tasks (p<.05). Differences between the two conditions were statistically significant rejecting the hypothesis of equality between groups (X^2=60.98; p<.0001). In addition, the discriminant analysis confirmed that 77.3% of students were correctly classified by the experimental conditions. Although the computer allowed for greater velocity when taking notes, handwriting enhanced students' grades when performing memory tasks.

RESUMEN

La toma de apuntes es una estrategia generalizada del alumnado de Educación Superior y se ha constatado su influencia en el rendimiento académico. El uso del ordenador está desplazando al método tradicional de lápiz y papel. El presente estudio pretende arrojar luz sobre las ventajas y los inconvenientes derivados del uso de uno u otro método en la toma de apuntes en las aulas universitarias. Un total de 251 estudiantes universitarios de ciencias sociales y ciencias de la salud participaron en el estudio. Se plantearon dos condiciones experimentales: toma de notas de forma manual (n=211) y de manera electrónica (n=40). Se hallaron diferencias a favor del grupo que usó el ordenador en las tareas basadas en completar el abecedario, escribir frases y reconocer palabras anotadas previamente (p<.05). Sin embargo, en la tarea de recuerdo libre los resultados reflejaron un mejor desempeño del grupo que tomó notas manualmente (p<.05). Se rechazó la hipótesis de igualdad entre los grupos (X^2=60,98; p<.0001). Además, el análisis discriminante confirmó que el 77,3% de los alumnos fueron clasificados correctamente según su condición experimental. El uso del ordenador resultó muy útil cuando se trataba de anotar datos con rapidez; sin embargo, en las tareas de recuerdo los alumnos de escritura manual obtuvieron mejores puntuaciones que los de escritura electrónica.

KEYWORDS | PALABRAS CLAVE

Note-taking, handwriting, computer-writing, short-term memory, levels of processing, higher education.
Tomar notas, escritura manual, escritura electrónica, memoria a corto plazo, niveles de procesamiento, educación superior.

1. Introduction

Traditional handwriting is becoming increasingly uncommon as the use of electronic devices increases. Computers are part of the work routines of a large number of professions, and electronic devices are used at all stages of the education cycle as learning tools for academic purposes (to study, to complete assignments, to take classroom notes and to search for information) (Sevillano-García, Quicios-García, & González-García, 2016). Many people record their thoughts by typing in multiple digital settings (blogs, websites, twitter messages, comments on social networks etc.). In fact, it is not uncommon to associate progress and innovation in the teaching and learning process with the use of computerised systems. It seems that in some schools in the USA and Germany, handwriting is no longer part of the curriculum. Students learn the alphabet as it appears on a computer keyboard (Paschek, 2013: 19). In short, handwriting is becoming less common due to the use of computers and smartphones.

Some studies have been very persistent in emphasising the advantages of keyboard typing over handwriting (Rogers & Case-Smith, 2002). This enthusiasm is not new: throughout history, whenever new technological tools have appeared, in one way or another they have moved into the field of education. This was the case, for example, with the now obsolete typewriter, whose educative values were highlighted in several publications of the time (Conard, 1935).

Recently there has been renewed interest in verifying the advantages or disadvantages of writing by hand or with a keyboard. However, results are far from being conclusive (Longcamp, Zerbato-Poudou, & Velay, 2005; Sülzenbrück, Hegele, Rinkenauer, & Heuer, 2011).

Some of these studies have been done with schoolchildren, emphasizing the superiority of handwriting with regard to both the reproduction of letters of the alphabet and the quality of written composition (Berninger, Abbott, Augsburger, & Garcia, 2009; Connelly, Gee, & Walsh, 2007). Others have highlighted the cognitive processes associated with digital writing, such as working memory (Bui & Myerson, 2014; Smoker, Murphy, & Rockwell, 2009), and the «qwerty» effect (Jasmin & Casasanto, 2012). The «qwerty» effect refers to the influence of the position of letters on the keyboard and the meaning of words. What we do know, however, is that taking notes in the classroom facilitates learning. It seems that a positive correlation exists between the amount of classroom notes taken and the amount of information encoded during the class (Bui, Myerson, & Hale, 2013). This advan-

tage can be explained by the word generation effect (Rabinowitz & Craik, 1986), which indicates that when information is re-elaborated by a student it is more easily remembered than when it is only heard or read. However, quality of notes can be much more important than quantity, and this is consistent with the levels of processing theoretical framework (Craik & Lockhart, 1972). Extensive literature exists about this topic, mainly based on studies using handwriting (see meta-analysis in Kobayashi, 2005). As stated by Bui & al. (2013), it is possible that taking notes in class using digital devices changes the balance between quantity and quality. However, more empirical research on its effects on learning is needed.

Nowadays, considering the expansion of new technologies, the number of students taking notes with a computer or tablet is significantly increasing (Cassany, 2012; Weaver & Nilson, 2005), and the old fashioned pen-and-paper method is decreasing. Some studies encourage the use of electronic devices as aids for learning strategies (Hyden, 2005; Tront, 2007), whereas other researchers argue exactly the opposite claiming that these resources hinder and diminish students' academic performance (Fried, 2008; Kay & Lauricella, 2011; Ragan, Jennings, Massey, & Doolittle, 2014).

Bui & al. (2013) designed several experiments to study the relationship between remembering information and different strategies for taking classroom notes. In one experiment, some participants took notes using laptops and others by hand. Those using computers obtained better results in short-term memory tasks, and the conclusion was that participants who used laptops to take classroom notes wrote more content and recalled more information in free short-term recall tasks. Recently, Beck (2014) tried to replicate and expand the experiment by Bui & al. (2013), but obtained considerably different results. He studied the differences between both short-term and long-term memory tasks. Beck's (2014) study found that the computer was a powerful tool for registering quantitative information. Although university students taking notes with a laptop recorded significantly higher amounts of information, they did not reach significant differences in short-term or long-term memory tasks. However, students taking handwritten notes scored higher in memory tasks.

The lack of conclusive research about the advantages and disadvantages of using different approaches to taking classroom notes in different behavioral areas is noticeable, and it motivated us to study the consequences of several learning processes in higher education. Since it is increasingly common to see university students using computers (or tablets) as writing tools

for taking classroom notes, writing assignments, and so on, the aim of our research was to discover the differences in the amount and quality of recalled information according to the notetaking procedure used: traditional handwriting or computer writing. Consequently, particular attention was paid to analysing the effects of information coding and recording methods on memory, in the framework of levels of processing (Cermak & Craik, 2104; Craik & Lockhart, 1972; Lockhart & Craik, 1990). This approach argues that tasks requiring only superficial processing result in lower recall performance than tasks requiring deeper processing. Thus, a hypothesis was formulated stating that the use of a computer, as it allows for a higher speed of notetaking, increases the quantity of classroom notes, but that the lower amount of time that computer-typing students spend processing is detrimental to the memory trace of the information.

2. Method
2.1. Participants

A total of 251 students of the University of Cadiz were evaluated. The students came from social and health science programmes (Psychology n= 134; Pre-school Teacher Education programme, n=57; and Primary School Teacher Education programme, n=60). A total of 54 students were men and 197 women, and their average age was 19.2, SD=1.2. They voluntarily participated in the study. All students were Spanish speakers, 9% were left-handed and 91% right-handed. Participants were distributed into two groups: (1) those who regularly took classroom notes using computer devices (n=40); and (2) those who regularly took handwritten classroom notes (n=211). The size of the groups reflects the sociological reality of students' routine use of computers (or tablets) when taking classroom notes in the university.

2.2. Material and procedure

Participants completed all tasks in groups of approximately 40 students, using their own laptops or pen and paper. All students received information about his/her participation in a general psychology experi-

ment, but they initially did not receive further explanation about the purpose of the study. The experiment was conducted during normal class time. The students participated voluntarily in the experiment, and they did not receive extra credits or any other academic compensation. At least two researchers were present during the experimental sessions in order to supervise students' activities. Three different tasks were administered:

• Task 1. Repetitive surface processing task: write the letters of the alphabet in alphabetical order as many times as you can in 30 seconds. When the time

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was up, the examiner stopped the stopwatch and said loudly, «Time's up», and all participants had to stop writing. Participants who were taking classroom notes by hand were provided with a sheet of paper. Students who used computers were asked to open a new word document, save it as a «.doc» file, and then submit it immediately to an e-mail address provided. The specific verbal instruction for this task was: «Write the letters of the alphabet in alphabetical order as many times as possible». Responses scored one point for each alphabet completed in the correct alphabetical order.

• Task 2. Verbal fluency repetitive task: write all the sentences you can in 2 minutes. The first sentence should start with the verb «write» (for handwriting participants) or with the verb «read» (for computer writing participants). Handwriting students received

the following instruction: «Please write as many sentences as you can in the time given. The first sentence must start with «write» or, in the case of computer writing students, «to read»; all the others can be anything you like». Each correctly written and consistent sentence scored one point. Sentences considered illegible, misspelt, incorrect and/or inconsistent scored zero.

• Task 3. Memory Task. A list of 35 common words was presented. Words were written in the left column of a piece of paper or on the computer screen. Handwriting participants had to copy them in the right column of the paper, and computer typing participants had to copy the list on the right side of the word document. When the task was finished, all assignments were collected, and a «distracting task» was administered on a new piece of paper or document. The distracting task consisted of solving as many 5-figure multiplications as possible during 5 minutes. Immediately after the distracting task, participants were given 5 minutes to write all the words they could recall from the original word list that they had previously copied on a sheet of paper or on the computer (memory task). Next, a 5 minute break was provided. Finally, a word recognition task was administered, which consisted of a list of 40 words (35 true and 5 false) presented on a sheet of paper or on the computer screen. Participants had to indicate which words corresponded to the stimulus words that had originally been presented.

All tasks were administered in one 40-minute experimental session, during the 2014-15 and 2015-16 academic years. Tasks 1 and 2 were designed based on methodology used by Berninger & al. (2009). Task 3 was designed following methodology used by Smoker & al. (2009). Sessions were held in university classrooms where participants usually received their regular teaching. The lighting and sound conditions were acceptable and the students' collaboration was satisfactory. Reliability between two observers was calculated for all students' responses (reliability average was 95.8%).

3. Results

In order to analyse the differences between students' scores on the three tasks proposed, a statistical descriptive analysis was carried out (table 1).

Table 1 shows that the group that worked with a computer wrote the alphabet a greater number of times and achie-

ved a higher number of correct sentences. Moreover, their performance was higher in the recognition task. However, the results were the opposite in the recall task in which participants who were using handwriting obtained better results. The differences between both groups are relevant considering the effect size.

To compare whether the differences between the two groups were statistically significant, a one-way analysis of variance was calculated. In order to do this, the necessary quantitative principles were compared. The Kolmogorov-Smirnov (p<.05) comparison indicated that the sample was not normally distributed. Therefore, the ANOVA calculation as a procedure for hypothesis testing was not appropriate. Consequently, we chose the non-parametric Mann Whitney U test to check the null hypothesis: the differences between the two groups in the three tasks were not significant (table 2).

As can be seen in table 2, the differences between computer writing and handwriting experimental conditions were significant for several tasks. As was expected, students who took classroom notes by computer wrote the alphabet a higher number of times than those who used handwriting (p<.0001). In addition, the number of correct sentences written by the students was higher in the computer writing group (p<.008). Similarly, the number of incorrect phrases was also higher for this group, although non-significant differences between groups were found (p>.05).

With regard to the short-term memory tasks -the recognition and recall tasks- the differences were in function of the experimental conditions (computer writing and handwriting). In the recognition task participants using computer writing scored higher than those using handwriting. Differences were statistically significant for correct answers and errors. Students who used the computer got a higher number of correct responses on recognition tasks (p<.002), while handwriting students obtained a statistically significant higher number of errors (p<.005).

Table 1. Descriptive statistics and effect size for different tasks and experimental conditions (Handwriting and Computer writing)				
	Computer writing	Handwriting		
	M (SD)	M (SD)	d	r
Alphabet rate	2.00 (.14)	1.39 (.04)	5.92	.94
Correct sentences	11.10 (.99)	8.23 (.28)	3.94	.89
Incorrect sentences	.52 (.13)	.32 (.04)	2.07	.72
Recognition correct	31.52 (.64)	29.97 (.33)	3.04	.83
Recognition errors	8.47 (.64)	10.71 (.34)	-4.37	-.90
Recall correct	7.22 (.38)	8.71 (.25)	-4.63	-.91
Recall errors	1.40 (.36)	.95 (.11)	1.69	.64

In the free recall task, the handwriting group achieved a better result. The number of recalled words was higher and statistically more significant for this group than for the computer writing group (p<0.021). The handwriting group made fewer errors, but the differences were not statistically significant (p>.05).

In addition, a discriminant analysis was performed between the two experimental conditions in order to obtain a mathematical function to classify students according to the discriminating variables, namely their scores in the three tasks. This technique provided a supervised statistical analysis data-vector classification procedure of the two categories (handwriting and computer writing conditions). The analysis was based on a mathematical decision-boundary-hyperplane able to statistically categorise both groups of participants, reducing the probability of misclassification. This distribution was compared to the data obtained in the experiment and a scattering matrix was constructed. This matrix was able to corroborate a diagonal line with the total proportion of correctly-classified participants. Moreover, the extra-diagonal data points represented the false positive and false negative classification process (table 3).

According to the discriminant analysis, 82.5% of participants from the condition «computer writing» were correctly classified. In addition, 76.3% were classified as belonging to the condition «handwriting». As a result, the data suggested that there was a characteristic pattern addressing the differences in the memory task achievement as a function of the information-recording approach. Because the number of participants in both conditions was dissimilar, it was concluded that a total of 77.3% of the original groups were correctly classified by the discriminant analysis.

At the same time, an equal group contrast using the Wilks' Lambda test statistic was carried out. Then the result was calculated by Chi-square estimation. This multivariate analysis of variance rejected the equality between groups hypothesis (Wilks' Lambda =.780; X^2=60.98; p<0.0001). Consequently, it was concluded that the differences between participants of both experimental conditions were statistically significant, supporting the results shown in table 3.

4. Discussion and conclusions

This paper analyses how taking classroom notes by hand or computer is related to academic performance and immediate recall. Nowadays, digital keyboarding is very common in university classrooms, and there is a huge variety in the way that university stu-

Table 2. Results of the Mann Whitney U test comparing computer writing and handwriting groups		
	Z	p
Alphabet Rate	-4.65	.000*
Correct Sentences	-2.66	.008*
Incorrect Sentences	-1.75	.080
Recognition Correct	-3.16	.002*
Recognition Errors	-2.82	.005*
Recall Correct	-2.31	.021*
Recall Errors	-.89	.371

*p<.05

dents take notes and in what devices they use. Therefore, studies are being carried out to establish which procedures may increase significant information recall, and how students interpret content.

The activity in which higher education students usually spend most of the time during traditional lectures is taking notes (Moin, Magiera, & Zigmond, 2009). According to some studies, this activity involves cognitive processing and offers a higher probability for later recovery of content than when students only pay attention to the lecturer's information without taking notes (Dunlosky, Rawson, Marsh, Nathan & Willingham, 2013). Notetaking is a multidimensional process because the students must pay attention to the explanation, select the relevant information and then translate it into specific phrases (Steimle, Brdiczka, & Mühlhäuser, 2009; Stefanou, Hoffman, & Vielee, 2008). Several higher order cognitive processes are involved in taking classroom notes, such as attention and memory. Considering the memory process, it seems that taking notes facilitates recall of information both qualitatively and quantitatively (Einstein, Morris & Smith, 1985; Fisher & Harris, 1973). This is one of the reasons why taking classroom notes is a very common student activity.

The results of this experiment suggest that the computer is an efficient tool for recording information because students using the computer could write the alphabet a greater number of times than those writing by hand. This data coincides with Beck's (2014) study, which also found an improvement in the quantitative registration of information. Computer writing users also wrote more sentences than handwriting students did, which could be because these types of surface processing tasks can be enhanced by new technologies. However, the results we found in memory tasks significantly differed from those obtained by Bui & al. (2013), and are coincident with the data found by Beck (2014) in that handwriting students performed statistically significantly better than computer writing

Table 3. Results of discriminant analysis to predict in which experimental conditions (Computer writing and Handwriting) participants were grouped				
		Predicted group membership (*)		
		Computer writing	Handwriting	Total
Frequency	Computer writing	33.0	7.0	40
	Handwriting	50.0	161.0	211
%	Computer writing	82.5	17.5	100
	Handwriting	23.7	76.3	100

(*) 77.3% original grouped cases correctly classified.

participants in the short-term free recall task. However, in the recognition task, computer writing students scored significantly higher results.

How can we explain these results? One possible explanation can be found in the levels of processing framework (Cermak & Craik, 2014; Craik, 2002). Performing a task that involves considering words as objects or sets of letters, as happens in taking classroom notes using computer devices, leads to very superficial processing. This kind of processing consequently affects the encoding and recall of content. The superficial processing may be successful in tasks that do not require deep processing, such as a recognition task involving short-term memory encoding. This explanation would support some results of our experiment. However, when a task involves processing words as semantic units, processing at a deeper level of analysis is required, making it more likely that the words will be remembered and that students will obtain better results in a free recall task. Using the computer as a tool for notetaking involves an initial advantage by increasing the amount of information recorded, as can be seen in the results for Tasks 1 and 2, but this efficiency is lower when the task demands a deeper coding level: this is more efficiently achieved using handwriting. The computer writing achievement is higher in those tasks where the retrieval of information requires a lower level of processing, whereas handwriting students' performance is higher when the task requires a deeper encoding (Mueller & Oppenheimer, 2014; Treisman, 2014). When the information input needs to be «translated» to specialised codes, it leads to the formation of more complex mnemonic representations. For example, listening to a lecture requires a phonological processing, but writing the ideas heard also requires their «translation» into orthographic processing, which can facilitate information recall. The advantage of computer writing is clear as to the amount of notes that can be taken; however, this is not automatically transferred to the quality of the information collected. We can process information more deeply when we can organise it more significantly,

and this can lead to longer-term learning (Bui & al., 2013).

There is still extensive room for research in this area, but it is possible that to progress from an automatic repetition of letters or words (Tasks 1 and 2 of our experiment) to writing full semantic and grammatically meaningful sentences (as happens when taking classroom notes in university settings) can be more efficiently done by hand. This way of taking notes increases memory processing because it appears to encourage more complex and stable memory links (Smoker & al., 2009). The Spanish writer Rafael Sánchez Ferlosio said that «in order to struggle against the secondary effects of amphetamine abuse, I spent a lot of time practising calligraphic tasks» (El País Semanal, 25-10-2015: 62). There is no data to support his intuition. However, in the face of current controversy, teachers could be making a mistake in suppressing handwriting from the school curriculum (Clayton, 2015): «Those who are skilled at handwriting will always have an advantage over those that just use computer writing as the only means of written communication. Technological advances could progress backwards and it is not unlikely that handwriting will replace keyboards in the future as the best way to interact with computers» (Clayton, 2015: 65). The current study suggests a research topic, linking the way university students take classroom notes to levels of information processing, and the possibilities of semantically coding the information. The differences that exist between handwriting and computer writing registering procedures should be analysed for tasks that require deeper levels of processing than simple transcription. Similarly, both short-term and long-term recall differences should be assessed.

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