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Pathological publishing: A new psychological disorder with legal consequences?

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ABSTRACT

The present study deals with an important problem that currently affects scientists and society, namely, the falsification and manipulation of research and researchers' CVs, which has considerably increased in recent years. This is shown by some studies, the authors of which have found high percentages of researchers who falsify their CV or manipulate data. We analyze the system used to evaluate science and researchers, which is almost exclusively based on the impact factor. We review the main critiques on the inappropriate use of the impact factor to assess researchers and argue that this has generated a new style of thinking in which the only goal is to obtain publications with an impact factor. Over the last few years, the pressure to publish has led to an obsession among researchers to disseminate the multiple indicators of their scientific publications over the Internet, to the extent that such initiatives look like marketing campaigns where researchers advertise themselves. For all these reasons, we propose that this may be a new psychological disorder, given that several criteria indicating maladaptation are clearly met: falsification and/or manipulation of data, falsification of publication indicators, distortion of reality, belief in manipulated data, and an obsession to conduct marketing campaigns of oneself. We address the important ethical and legal implications of such falsifications. Finally, we discuss the need to change the system used to evaluate science and researchers, which undoubtedly promotes these dishonest behaviors or this psychological dysfunction.

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La publicación patológica: ¿un nuevo trastorno psicológico con consecuencias legales?

RESUMEN

En este trabajo se aborda un importante problema actual que afecta a los científicos y la sociedad, esto es, el problema de la falsificación y manipulación de las investigaciones y de los currículos de los investigadores, lo cual ha aumentado considerablemente en los últimos años, llegándose a encontrar en algunos estudios altos porcentajes de investigadores que falsifican sus currículos o manipulan datos. Se analiza el sistema de evaluación de la ciencia y de los investigadores y como éste se basa casi de manera exclusiva en el factor de impacto. Se hace un repaso de las principales críticas sobre el mal uso del factor de impacto para evaluar a los investigadores y cómo esto ha generado un nuevo estilo de pensamiento en el que el único objetivo es conseguir publicaciones con factor de impacto. Esta presión por publicar se ha transformado en los últimos años en una conducta obsesiva por difundir, a través de internet, los múltiples indicadores de las publicaciones científicas hasta tal punto que parecen campañas de marketing de sí mismo. Por todo ello se plantea la discusión de si esto se trata de un nuevo trastorno psicológico, pues se dan varios criterios claramente desadaptativos: falsificación o manipulación de datos, falsificación de indicadores de las publicaciones, distorsión de la realidad creyéndose los datos manipulados y obsesión por hacer campañas de marketing sobre sí mismos. Se comentan las importantes implicaciones éticas y legales que suponen estas falsificaciones. Por último, se discute sobre la necesidad de cambiar el sistema de evaluación de la ciencia y de los investigadores, lo cual sin duda es lo que propicia estas conductas deshonestas o disfunción psicológica.

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Consecuencia éticas y legales

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The classification of mental and behavioral disorders has a long history. Yet, a review of the classifications made in recent decades by the American Psychiatric Association (APA) and the World Health Organization (WHO) and the reactions and critiques received by every new classification shows that there is still no clear definition of a psychological disorder. In the areas of Psychiatry and Clinical Psychology, the scientific community has yet to reach consensus on the best classification of such disorders (Obiols, 2012; Reed, Anaya, & Evans, 2012). The recent publication of the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) (American Psychiatric Association [APA], 2013) has elicited a great controversy: thousands of psychiatrists and psychologists have reacted against this classification because, among other reasons, they argue that it includes disorders that should not be considered as such. Although there is some truth in this, the main reason for such a controversy is that no agreement has been reached yet on what a psychological disorder is and which disorders are dimensional or categorical. In fact, there is not even agreement on which term should be used to refer to them. The various terms currently used include mental disorders, psychological disorders, psychiatric disorders, behavioral disorders, psychopathological disorders, behavioral problems, and psychological problems, among others. Moreover, these terms do not always mean the same depending on the researcher, author or clinician that uses them. Their meaning is mainly determined by the theoretical model used, which varies a lot between biological, psychometric, or behavioral approaches.

Historic and cultural perspectives are not less important. In fact, they have influenced and often even determined whether certain behaviors are considered disorders or not. In short, the key problem is that there is no consensus over what constitutes a psychological disorder and which term should be used. For this reason, every new classification of psychological disorders will always have advocates and critics. As a result, not only classifications of mental disorders but also the concept of mental disorder itself are currently being questioned (see Timimi, 2014).

One of the main criticisms made every time a new classification is published is that it increases the number of disorders. An analysis of the classifications of the DSM since its creation in 1952 shows that the number of disorders has continually increased from its first edition, which included 106 disorders, to the current DSM-5, which includes 266 disorders. In other words, the number of disorders has grown by more than 100% in six decades. In the latest edition, this increase also applies to the overall categories of disorders included in the manual, which have increased from 16 to 21 (Rodríguez-Testal, Senín, & Perona, 2014).

There are many reasons to argue that everyday life is being 'psychopathologized.' Nevertheless, it is also true that developed societies are increasingly complex. This leads to new dysfunctions, such as addiction to the Internet (Block, 2008), cell phones (Ahmed, Qazi, & Perji, 2011), and video games (Carbonell, Guardiola, Beranuy, & Bellés, 2009); there is currently a debate over whether such dysfunctions should be considered disorders or not. Therefore, criticizing new editions of the DSM for including an increasing number of disorders may not be appropriate. In fact, it is logical to expect the number of disorders to grow with the complexity of developed societies. In addition, diagnostic instruments and systems are increasingly better at discriminating between different disorders, which also explains the higher number of disorders in new classifications.

The proposal for a new psychological disorder can be made in different ways. Sometimes a new disorder is proposed by one or several authors and the scientific community evaluates it and ratifies the new diagnostic entity or not. On other occasions, clinicians highlight that something does not match the official classification according to diagnostic systems.

The objective of this article was to propose an analysis and reflection about whether the manipulation and falsification of

research data and the compulsive behavior of displaying and advertising publication indicators constitutes a psychological disorder or dysfunction.

The first reference to a 'controversial diagnosis for dishonest scientists' was proposed by Gullo and O'Gorman (2012). Their article was a satirical piece written for the special issue of Perspectives on Psychological Science, on research practices in psychology. When the fifth edition of the DSM was being developed, the chair of the task force said the new diagnosis would help combat the emerging epidemic of scientists engaging in questionable research practices. In an ironic tone, the authors went as far as to propose the following diagnostic criteria:

"The essential feature of *pathological publishing* is the persistent and recurrent publishing of confirmatory findings (Criterion A) combined with a callous disregard for null results (Criterion B) that produces a 'good story' (Criterion C), leading to marked distress in neo-Popperians (Criterion D)" (p. 689). However, the concept of *pathological publishing* used in such article differs from that used in the present paper, which focuses on behaviors related to false publications and falsifying one's CV. Although a lot has been written on the use or abuse of the impact factor, little attention has been paid to the underlying causes of 'impact factor mania' (Casadevall & Fang, 2014).

Definition of Pathological Publishing

Possible criteria for pathological publishing:

- Having an excessive eagerness to show, disseminate, and advertise one's articles. This is reflected in a compulsive behavior that consists of including one's publications and indicators of one's publications in numerous devices that are listed below.
- Falsifying articles including false or manipulated data in articles to obtain more publications or publish in journals with a higher impact factor.
- Falsifying one's CV including records of papers that are not such or duplicating articles.
- Distorting reality believing the data that one has falsified or manipulated.
- Distorting reality believing that something is an article when it is not (e.g., book reviews, meeting abstracts, editorial material, proceeding papers, notes).

Internet devices where indicators of publications are advertised:

- ResearchGate
- Scopus Author Identifier
- WoS ResearcherID
- Google Scholar profile
- ORCID (Open Researcher and Contributor ID) profile
- Twitter profile
- Facebook profile
- LinkedIn profile
- Mendeley profile
- Delicious profile
- Microsoft Academic Search profile
- Academia.edu profile
- CiteULike
- Author Resolver™ (from Scholar Universe)
- INSPIRE, the High Energy Physics information system
- RePEc (Research Papers in Economics)
- IraLIS (International Registry of Authors-Links to Identify Scientists).
- Vivoweb profile
- Blogger profile
- Having blogs
- Signing up for citation alerts
- Really Simple Syndication (RSS)
- Having e-mailing lists such as IweTel or Incyt
- Calculating one's h-index and updating it frequently

- Counting citations to one's work and updating the number frequently.
- Counting article downloads
- Calculating the cumulated impact factor and updating it frequently.
- Publishing anything to increase the number of publications
- Continuously updating one's CV
- Including one's CV and various indicators of the CV in a personal web page.
- Including ResearcherID or other indicators in web pages that include the production of colleagues.
- Using Web 2.0 to increase the number of citations
- Others

Some authors use many of the above-mentioned devices, which requires a significant investment in terms of time. It is also worth noting that it takes time to update the data every month. In fact, this is just continuous marketing to try to be better known and obtain more citations. We should ask ourselves what the merit of citations obtained is thanks to marketing and what this has to do with research and progress in a given area of knowledge.

Last, we should reflect on whether it is a new or different disorder or it could be just a possible expression of the so called compulsive personality (or anancastic personality disorder, according to CIE and obsessive-compulsive personality disorder, according to DSM) given the behavioral and clinical connection of this proposal. A similarity could in fact be searched to what happens with the traditional type A personality pattern (actually an expression of hostility and competitiveness characterizing compulsive personality) or the more recent type D personality pattern (other expressions of cluster C personality disorders). In a nutshell, this proposal could be considered to be integrated into the different pathological expressions of the obsessive-compulsive personality disorder or it could be deemed as a different disorder.

Distorting Reality

The obsession for publishing a large number of articles leads some authors to distort reality and forget what a scientific article is. Databases such as WoS and Scopus clearly establish what an article is and distinguish between articles and other products they contain. There are documented cases of authors that include the following types of publications in their ResearcherID under the category of articles: meeting abstracts, proceeding papers, editorial material, book reviews, notes and letters (see, for example, the cases described in Olivas-Ávila and Musi-Lechuga, 2012, 2013, 2014). Some authors seem convinced that any product that appears in the WoS is an article. This is a distortion of reality whose causes and consequences should be considered from a psychological (i.e., pathological) and legal approach. Let us look at the example of an author who falsified his ResearcherID and justified it by saying "in my opinion, they are not publisher's notes but articles for the following reasons: a) they have the format of an article (i.e., different headings, ... tables and references) and they have also undergone a review process and are cited by other authors" (personal communication of a Spanish professor). According to these arguments, various documents included in the WoS such as proceeding papers could be considered articles. Applying the same rationale, articles published in journals that are not indexed in the Journal Citation Reports but are cited in the WoS would also meet these criteria. In short, the criteria used to determine what an article is should not depend on the judgment of every individual author, since the motivation to have more and more records can eventually distort individuals' perception of reality, as happened in the above-mentioned example. It appears that this author and many others do not realize that articles have very different standards and review processes from those of other products (e.g., meeting abstracts, proceeding papers, editorial material, book reviews, notes, letters).

Contextualizing the Disorder

Many cases of false research have been documented throughout the history of science and scientific publications. This phenomenon has become part of the history of scientific research and has affected very prestigious journals. Every year there are scandals involving new publications based on false data, which unfortunately are no longer considered surprising. In fact, nobody knows how many published studies include false data, as only those that have been identified are known. This suggests that the real number of studies containing false data must be much larger.

There are several ways of publishing false studies. A few examples are manipulating the data to eliminate certain elements in order to obtain better results, manipulating the research designs or protocols, directly fabricating the data, being listed as a co-author in publications without justification, violating ethical rules, breaching or manipulating informed consent, adjusting the results to favor the interests of funding bodies and using sophisticated statistical analyses to give a scientific appearance to unscientific studies. There are many examples of such dishonest procedures in the history of science, and Psychology is no exception.

One of the reasons why it is easy to falsify research is related to the policy of scientific journals. Specifically, there is a major trend to only publish studies that provide a new contribution to the state of knowledge. This obviously makes it difficult to publish studies that replicate previous research. Another of the biases caused by the editorial boards of scientific journals is the tendency to publish studies with positive results (i.e., those in which the starting hypotheses are confirmed). This is particularly important in the areas of Psychology and Psychiatry, which have shown to be the disciplines most affected by this bias (Fanelli, 2010b; 2012).

There is a great interest in promoting replicability to ensure the reliability of the findings of studies. A good example of this is the Open Science Collaboration project (2012), which involves more than forty institutions and over seventy researchers. Its aim is to replicate several studies published in prestigious Psychology journals. Yet, replicability differs between the various sciences and is rather complex in the area of Psychology (Pashler & Wagenmakers (2012)). In addition, the fact that some studies cannot be replicated does not necessarily imply that they are fraudulent, although the impossibility to replicate studies facilitates the discovery of scientific fraud. However, replicating scientific studies is not the only way to consolidate or verify scientific knowledge. It is also necessary to conduct critical and systematic analyses of the articles published. An example of this is the study conducted by Brown, Sokal and Friedman (2013), which proved that the well-known 'positivity ratio' has no justification but also contains major errors from a conceptual and mathematical point of view. Meta-analyses are not less important, as they can highlight articles with effect sizes that are disproportionately higher than those usually obtained in specific areas of research (Perugini, Gallucci, & Costantini, 2014). For this reason, studies should be published in such a way that they can easily be replicated. In this regard, Asendorpf et al. (2013) made important recommendations for researchers, publishers and reviewers that should be taken into account, as they also facilitate the discovery of publications with false or manipulated data. Along the same lines, Stroebe, Postmes, and Spears (2012) suggested a number of strategies that may reduce the risk of scientific fraud.

According to the scholars who are interested in these issues, the falsification of research may be a consequence of the pressure to publish that exists in many countries and that has led to the expression "publish or perish." This expression has become usual among scientists, particularly since the last decades of the last century. Although this phenomenon is not new, the pressure to publish has increased in recent years, to the extent that for many researchers publishing has become a goal in itself. Publishing the

findings of research has shifted from being the natural result of research to becoming its only goal.

Over the last few decades, a “culture of scientific publication in impact factor journals” has developed in several countries. Scientific books in general and textbooks in particular are losing importance even in the training of undergraduate students, and reading and discussing scientific papers is increasingly valued. The format of doctoral dissertations has also changed, and more and more of them include a compilation of articles published in impact factor journals. Moreover, in the processes used to select and promote lecturers and researchers, the most important aspect is the number of articles they have published in journals with a high impact factor. This culture based on publication in journals with a high impact factor has recently been referred to as “The ‘impact factor style of thinking’: A new theoretical framework” (Fernández-Ríos & Rodríguez-Díaz, 2014) and “the tyranny of the impact factor” (García, 2014), and as seemingly irrational behavior referred to as “impact factor mania” (Casadevall & Fang, 2014).

In this context of worship of the impact factor, the proliferation of bibliometric indicators seems unstoppable. Such indicators are used in all the areas of science to assess researchers, articles, journals (Buela-Casal, 2003; 2010; Wouters, Costas, 2012), research projects (García, 2014), and institutions and countries (Bengoetxea & Buela-Casal, 2013; Butler & McAllister, 2011). There is currently an obsession to create and use indicators and every time a new indicator is created a proliferation of variations are quickly developed, to the extent that one may wonder whether this is pathological. An example of this is Hirsch’s h-index (2005), of which about forty different variations had been proposed only five years after its creation (Bornmann, Mutz, Hug, & Daniel, 2011).

There is an excessive eagerness to quantify scientific production in all spheres. Yet, most of the indicators used measure quantity rather than quality and, although both types of indicators are related to each other, they are not the same (Buela-Casal & Zych, 2010; Graczynski, 2008; Simons, 2008; Vale, 2012). In addition, citations are an indicator that is very sensitive to the language of publication and even to the country where research is published (González-Alcaide, Valderrama-Zurián, & Aleixandre-Benavent, 2012; Jaffe, 2011). Hence, it would be absurd to argue that a publication has higher or lower quality depending on the language or the country in which it was published. In fact, publications have been found to contain considerable biases as a function of the country of origin of their authors (see, for example, Fanelli, 2010a; Fanelli & Ioannidis, 2013).

For all these reasons, it is not surprising to note that there are movements against using and abusing this way of evaluating science. For example, the European Association of Science Editors (EASE) (2007) published a manifesto stating that the impact factor was developed to measure the impact of scientific journals but started to be used to measure the quality of scientific journals as well; later, it was also used to measure the quality of individual articles and eventually became a tool to measure the productivity of researchers themselves (based on the cumulated impact factor of the journals where they publish their research). It is currently used in any assessment of academic merit or eligibility for research funding. The EASE recommends that the impact factor should be used only to compare journals, not to assess researchers. In short, the idea is to return to the beginning and use the impact factor for the purpose originally intended by Garfield (1955) and Gross and Gross (1927) when they developed the predecessor of the impact factor, that is, as an index to compare journals.

Another important criticism of the abuse of the impact factor to assess research has been made by the American Society for Cell Biology (2013). It affects even the most prestigious journals such as *Nature*, *Science*, *Cell*, whose publishing policies have been questioned by Nobel Prize laureates (Lawrence, 2003; Schekman, 2013). Numerous scientists and heads of scientific journals and associations

have signed the San Francisco Declaration on Research Assessment (DORA). Similarly to the EASE manifesto, the DORA proposes that the impact factor should not be used to select or promote researchers or to make decisions on allocating funding for research. Along the same lines, Fernández-Ríos and Rodríguez-Díaz (2014) and García (2014) recently published critical analyses of the abuse of this way of understanding the evaluation of science. These approaches are consistent with the results of a study on the opinion of a sample of over 1,700 scientists from 86 countries with studies published in journals indexed in the Web of Science (WoS). The study revealed that, the higher the number of articles they had published, the more critical respondents were about the use of the impact factor to assess the quality of research (Buela-Casal & Zych, 2012).

Internet-based Technologies and Marketing of CV

In recent years, partly as a result of the progress made in Internet-based technologies, for many researchers this eagerness to publish in impact factor journals has largely become an obsession to obtain, exhibit, and showcase the indicators of their production in such journals. There are websites in which researchers can display their ResearcherID profile and other indicators of their publications (e.g., number of papers, number of citations, documents cited, average citations per document, h-index). The promoters of these websites use slogans such as “ResearcherID increases your visibility and recognition”, “this Web application has been developed to promote knowledge of researchers and their publications” or “it will only take you ten minutes to create your ResearcherID profile if you follow the instructions.” This seems like a modern version of the anthropometric laboratory established by Francis Galton in 1884 at the South Kensington Museum in London, where visitors paid three pence each to be tested and measured for a number of physical characteristics. Francis Galton built and published a table of scores where visitors could compare their measures with those of others. Today, the measurement of physical variables has been replaced with the measurement of scientific production.

For authors who advertise themselves on the above-mentioned websites, the quality of published articles and whether they contribute to learning is no longer important. What is important is the numbers they can provide on their scientific production and being able to display them publicly so that their colleagues are continually informed of how “their numbers” increase and at the same time to try and obtain more citations through marketing so that their indicators continue to increase. This has led to a new obsession in the form of “quantophrenia or an obsession to measure” with its corresponding Internet-based marketing campaign (for more information, see Kousha & Thelwall, 2014; Mas-Bleda, Thelwall, Kousha, & Aguillo, 2014a, 2014b; Shema, Bar-Ilan, & Thelwall, 2014; Thelwall, Haustein, Larivière, & Sugimoto, 2013).

The authors affected by *quantophrenia* resort to many strategies to advertise their publications. For example, they use Really Simple Syndication (RSS), a system that allows them to insert contents in various web pages and disseminate contents. They also use ‘wikis,’ that is, websites with collaborative content that can be edited continuously (see, for example, Peset-Mancebo, Ferrer-Sapena, Coronado-Ferrer, González-de-Dios, & Aleixandre-Benavent, 2011a, 2011b). Web 2.0 technology can undoubtedly contribute to making progress in science, which is essentially collaborative, provided that this tool is well used (Aleixandre-Benavent & Ferrer-Sapena, 2010) (for more information, see Thelwall, 2012; Thelwall & Kousha, 2014; Zahedi, Costas, & Wouters, 2014; Zang, 2012).

Prevalence

It is difficult to determine the prevalence of this possible disorder or dishonest behavior, first of all because nobody knows how many

publications contain false data. Given that only the cases that have been discovered are known, the true figure is likely to be significantly higher. There are bodies that assess possible cases of fraudulent publications, such as the Office of Research Integrity (ORI) of the Department of Health and Human Services in the United States and the Committee on Publication Ethics (COPE) in the United Kingdom. However, this does not provide information on the number of cases, as such bodies only explore cases reported or under suspicion and tend to focus on disciplines related to health sciences. Although a greater number of fraudulent studies has been discovered in recent years, this may be due to the fact that awareness about fraudulent research has increased among researchers and measures against misconduct have been strengthened (Fanelli, 2013).

The number of researchers who falsify their CV – intentionally or not – is not known either. However, some studies can provide guidance on this. For example, an article recently published by Olivas-Ávila and Musi-Lechuga (2014) has shown that 70% of researchers analyzed included a high number of articles that were not such in their ResearcherID. Such publications included meeting abstracts, editorial material, book reviews and several duplicated articles, among others. Similar results were obtained by Fang, Steen, and Casadevall (2012) when they reviewed over two thousand life-science and biomedical research articles indexed by PubMed as retracted. Their analysis revealed that only 21% of retractions were attributable to error. By contrast, 67% of retractions were attributable to misconduct, including fraud or suspected fraud, plagiarism, and duplicate publication; according to these authors, such fraudulent practices have increased tenfold since 1975.

In some studies, researchers have explored data falsification and other dishonest behavior focusing on scientists themselves. Results vary depending on whether participants are asked about falsification or manipulation of data. Respondents reported significantly higher rates of such behaviors when they are asked about their colleagues. A meta-analysis conducted by Fanelli (2009) revealed that scientists admitted to have fabricated, falsified or modified data or results at least once – a serious form of misconduct by any standard – and up to 34% admitted other questionable research practices. In surveys asking about the behavior of colleagues, admission rates were 14% for falsification and up to 72% for other questionable research practices. Similar results were found by John, Loewenstein, and Prelec (2012). This is consistent with the findings of Olivas-Ávila and Musi-Lechuga (2014), who found that 70% of researchers manipulated their ResearcherID.

The most concerning finding is that the increase in such fraudulent practices has been exponential in the last decade (Brumback, 2012). This indicates that this behavior is frequent among researchers and does not constitute a series of isolated events. Therefore, it is important to analyze the psychological aspects and legal consequences of this possible disorder or dishonest behavior.

Possible Causes

There are multiple reasons why researchers falsify studies or their CV. Unfortunately, this is not easy to explore, since not many scientists are willing to explain why they carry out such dishonest behaviors. According to Wouters and Costas (2012), one of the reasons is the high level of narcissism of some researchers. According to Fernández-Mondéjar and Ceraso (2011), other reasons include the need to maintain one's prestige and ego, the need to have a good CV to obtain funding and the involvement of companies with financial interests, among others. Further reasons include having had a traumatic experience in a competitive selection process because of not having enough publications in scientific journals, an excessive motivation to obtain a higher salary or a higher position as fast as possible, having started to publish late in journals indexed in WoS and Scopus and becoming obsessed with the fact that younger

colleagues have more publications, and the eagerness to have national and/or international personal recognition. It should be noted that it is relatively easy to falsify data and the chances of being discovered are low. This, along with the high pressure to publish and the international context in which “you are nobody if you don't publish” has created a breeding ground for such dishonest practices.

Legal Consequences

Falsifying data and/or claiming that certain documents are articles when they are not in applications for a promotion as a lecturer/researcher or to apply for a research project is a fraud that involves falsifying a public document. This has consequences for the individual researcher but also for the institution where he or she works, which is also responsible for his or her work in legal terms. Depending on the legislation of each country, there are administrative, civil and/or penal consequences. It is necessary to determine the relationship between psychological dysfunctions and the exemption of penal and civil responsibility (Anckarsäter, 2010). The consequences for readers are no less important given that, in health sciences, for example, fraudulent results may lead to changes in medical practice and cause damage to patients' health.

Ethical Consequences

The ethical consequences of such practices are as relevant as the legal implications, given that the credibility of the system of scientific publications is based on the belief that researchers are honest. Thus, every time a scientific fraud is discovered, the belief in science is jeopardized, particularly when researchers themselves falsify their own CV. It is obvious that the credibility of the studies conducted by such researchers is extremely low, as anybody who falsifies their CV is suspicious of falsifying their research. In short, this affects the scientific community and the society for which such authors work.

Conclusions

It is a fact that the falsification of data in research or CVs is an important problem, since it affects both science and scientists in general. What is most concerning is that this phenomenon has increased tenfold in the last four decades (Fang et al., 2012). This is clearly due to the way in which scientific production is evaluated. Because of this, it seems obvious that there needs to be a change in the system used to assess and select researchers and science in general (Schekman & Patterson, 2013; Simons, 2008). More and more institutions are advocating a change of the model used in scientific evaluation. As mentioned above, to what extent are citations the product of the quality of research? Do they really represent progress in a given area of knowledge or are they just the result of marketing in the dissemination of articles? Along the same lines, to what extent is it acceptable for scientists to spend time calculating the multiple numbers and indicators of their publications and continuously advertising them rather than conducting research, which should be the main objective of their work?

In addition, it is necessary to increase scrutiny to avoid and detect scientific fraud. This can be achieved by changing the policies of journals to avoid causing biases by publishing results with positive results and facilitating the publication of replication studies, and even using methods that enable detection of data manipulation, such as that used by Simonsohn (2013) to analyze the replication of results. It is also important for professional associations to provide oversight and guidelines for ethical behavior in research and publications (see, for example, those proposed by the European Federation of Psychologists' Associations (EFPA) (2013).

Data falsification and manipulation affects the credibility of science and its applications (Krull & Silvera, 2013; Lilienfeld, 2012).

This also applies to the falsification of publication indicators. This has a catastrophic impact on science and society. Therefore, it is necessary to determine whether the above-mentioned disorder exists or not and, if so, to what extent it affects researchers who carry out dishonest behaviors in their publications. This will be key to determine whether a reduction of or exoneration from responsibility should apply to such researchers. However, it is well known that the fact of having a disorder does not necessarily imply a reduction or exoneration regarding legal responsibility for one's behavior (APA, 2013; Wortzel, 2013). The decision should be made by appropriate specialized experts.

To conclude, individuals who conduct dishonest behaviors regarding scientific publications should be advised to follow the recommendations of the publication entitled *Self-sabotage in the academic career: 15 ways in which faculty members harm their own futures, often without knowing it* (Sternberg, 2013): "You are guilty of any form of academic dishonesty. If you are caught in any form of academic cheating, there is a single word to describe your career: over. It is very difficult to recover from verified academic dishonesty. Don't go down that road."

Conflict of Interest

The author of this article declares no conflict of interest.

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