Why publication ethics is relevant to information management: experience from the Committee On Publication Ethics

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Abstract
Although misconduct in research and publishing is not a new phenomenon, developments in information technology have had important effects. Computer software not only makes it easier to commit some types of misconduct (such as plagiarism and image manipulation) but also provides tools that can detect such misconduct. Electronic publishing also allows corrections and retraction statements to be directly linked to the affected articles, thus making it easier to alert readers to problems. Despite the availability of powerful tools, handling cases of suspected misconduct requires careful judgement. Journals and institutions should therefore have good policies and procedures for such situations. The Committee on Publication Ethics (an international body with over 9000 member journals) is one source for advice on these topics and its work is described. It is also important for journals and institutions to cooperate over cases of suspected and proven misconduct. A recent case provides a good example of effective investigation and cooperation by Japanese institutions.

1 Introduction
Misconduct in research and publishing is not a new phenomenon. One of the earliest recorded cases of plagiarism was noted by a Roman poet around 80 AD. The poet (Martial) complained that another poet had recited his work and claimed it was his own. So it is clear that ethical issues pre-date the technology of information management and even printing. However, developments in information technology may affect the ease with which some frauds are committed, offer tools for detecting some types of misconduct, and also provide systems that can minimise the harm caused by fraudulent publications. Therefore, there are strong links between information management and publication ethics.

This article is based largely on experience gained through my involvement with the Committee On Publication Ethics (COPE) where I was a member of its governing Council from 2006-2012 and, from 2009-2012, its Chairperson. I developed an interest in publication ethics from working first in the publishing industry and then as a medical writer in the pharmaceutical industry. This gave me a special interest in the topics of authorship and competing interests. In 2001, I set up my own company which provides training for researchers, editors and publishers, and consultancy to journals, institutions and companies.

2 How information technology makes some types of misconduct easier to commit, but also easier to detect
Plagiarism (which is copying another person's work without proper attribution and claiming it as your own) has occurred for centuries, even before the invention of printing (as we see from the anecdote from ancient Rome). However, word processing software makes the act of

"copy / paste" easier than before. It now requires almost no effort to copy words, images or data between documents. This not only facilitates deliberate plagiarism, by people who wish to deceive readers, but also increases the risk of inadvertent copying without proper attribution if documents are assembled from computer-based notes and the compiler loses track of the sources. A senior American academic (chairman of the Department of Medicine at the prestigious Stanford University, Dr Kenneth Melmon) was forced to resign in 1984 after it was found that he had incorporated sections of text from a well-known textbook into a chapter he had prepared for another book. He told an inquiry that 'when he cut-and-pasted the material into his manuscript, he added handwritten notations detailing where the text came from.' He also stated that the notations were supposed to have been printed in his own chapter but were accidentally omitted [1].

It is therefore important that students and junior researchers are taught the conventions of correct citation and paraphrasing, especially if copying material from the internet has been permitted or even encouraged for school projects. When students reach university, they will be expected to produce original material and must learn that copying from existing documents is only permissible if the copied sections are clearly marked (for example, by putting text into quotation marks) and the source is correctly cited.

However, although information technology has made plagiarism easier to commit, it has also made it easier to detect. Faced with high levels of plagiarism in students' work and submitted articles, many institutions and academic journals, especially in English-speaking regions, now use text matching software. Commercial software (from iThenticate) has been coupled with a large database of published academic work, supplied by publishers, to create a system called CrossCheck which is used by many journals to screen for plagiarism and redundant (or duplicate) publication. While many of the early systems only worked on text written in Roman script, at least one system (Turnitin, which is widely used in universities) can now screen work in other scripts including Japanese, Chinese, Korean and Thai [2]. The increased use of such software is illustrated by the recent announcement from Waseda University that it would check all graduate dissertations for plagiarism [3].

However, one limitation of such text-matching tools is that they can only screen words and therefore cannot detect plagiarism of illustrations or data. Also, although the tools are powerful, it is surprisingly difficult to define plagiarism in terms of the number of words copied, since what is acceptable varies depending on the context [4]. Journal editors therefore need to apply careful judgement to interpret text similarity reports and should avoid setting arbitrary limits.

While text-matching software only checks the text, other tools are available to detect falsification of images. The development of digital imaging (including photography, microscopy and other imaging techniques such as CT scans), like the development of word processing software, made the manipulation of images easy. For example, whole sections can be moved, duplicated or altered to give a false impression of the findings. This is considered a form of data falsification. However, the tools used to adjust the images can also be used to detect unacceptable manipulation. Many journals now provide guidelines to researchers on what is and is not acceptable and researchers need to understand these since some processing of images (for example, simply to increase brightness across the whole plate) is permissible [5]. Journals that publish large numbers of digital images may also screen images for falsification, such as changing the position of objects [6].

Information technology has therefore created both new opportunities for misconduct and new tools for detecting it.

3 Correcting the literature

Editors and publishers have another important duty relating to misconduct: that is to alert readers to problems and correct or retract published work that is unreliable. In the days of print, this was difficult to achieve, since corrections could only be published in later editions and it was almost impossible to link retraction notices to affected articles (unless librarians manually inserted erratum slips into their copies of the journal). However, electronic publishing and indexing has simplified this task. Since readers now usually access articles via an electronic search, it is easy to add notes to journal Tables of Contents, indexes and even the articles themselves. Therefore, corrections and retractions can be directly linked to the affected articles. Bibliographic databases and journal websites can also indicate related material such as comments and letters. An excellent example of the use of technology to alert readers to changes to articles is CrossMark [7]. This system provides a link to the most current version of a published article, with information on the publication history, alerting readers to any corrections or retractions. The link is available even if readers have stored a PDF version of an article on their own computer. Such technology greatly facilitates the publishers' responsibility for alerting readers to important changes to publications. It is hoped that this may reduce the well-documented phenomenon of retracted publications continuing to be cited long after they have been retracted [8].

The examples just described show the important role of information technology and management in the field of publication ethics. However, the tools available to editors, publishers and librarians, as with any technology, must be used wisely and carefully. Text matching software can produce 'false-positive' results, for example if a review is updated, or if a standard method is described. The tools, by themselves, cannot solve all the problems of research and publication misconduct, and it is therefore important that journals, publishers, and academic institutions have effective policies on these topics and good procedures for handling cases of suspected misconduct.

4 COPE

The Committee on Publication Ethics (COPE) was set up in 1997 in response to the needs of journal editors for guidance. Since then, COPE has grown from a handful of mainly medical editors, largely from the UK, to a global organization covering all academic disciplines with over 9000 member journals from around the world [9]. COPE's main purpose is to provide advice and guidance to editors and publishers of peer-reviewed, academic journals – it has sometimes been called a 'self-help group' for editors, and this is a good description. COPE is not a regulatory body and it does not undertake investigations into cases of suspected misconduct. The advice it provides is usually informal, often arising from discussion among editors at the regular COPE Forum meetings (which are now held virtually by telephone conference to enable global participation). COPE members can bring cases for discussion to these virtual meetings. The cases are always anonymised and they are entered onto a searchable database, together with the advice given at the meeting, which is freely available on the COPE website (www.publicationethics.org).

4.1 The COPE flowcharts

As a result of discussing cases for several years, COPE has developed flowcharts which give practical advice to editors in a step-by-step format on how to handle the most common types of problem. The flowcharts have been translated into Japanese and are available at

http://www.ronbun.jp/flowcharts/.

4.2 Retraction guidelines
COPE has also produced detailed guidelines on retractions, explaining when these should be used and when corrections or "expressions of concern" are more appropriate. This appears to be an area that continues to cause difficulties for journal editors. Although the COPE retraction guidelines were published in 2009, a study in 2013, analysing journals' responses to a series of cases of research misconduct by the German anaesthetist, Joachim Boldt, found that only 5 out of 88 articles (6%) had been properly retracted according to the COPE criteria and 9 had not been retracted at all. [10] An earlier study of a case of proven misconduct in the United States also showed delays and failure to retract the fraudulent articles [11]

4.2.1 Interest in retractions
The phenomenon of retraction has received increasing interest both from researchers and the media. Several studies have examined the causes of retractions [12-15]. This interest may be related to the fact that the number of retractions (both in absolute terms and as a proportion of the total number of articles being published) has increased dramatically in the last 10 years. It is impossible to tell if this increase represents a true increase in the number of cases of research and publication misconduct, since it might simply reflect the fact that journals now have more powerful tools for detecting misconduct (especially plagiarism, redundant publication and image manipulation) and are using them increasingly. However, there is undoubtedly greater public interest in retractions and there is even a popular blog devoted to this topic, called Retraction Watch [16].

4.3 Cooperation between journals and institutions
One problem that journal editors face is that, although they are responsible for what they publish, and therefore need to know if any published material is found to be unreliable, it is often difficult, and sometimes impossible, to get the information they require from institutions [17]. Investigations into suspected misconduct are generally kept confidential so that if a researcher is found "not-guilty" their reputation will not be unfairly affected. However, if an investigation finds that misconduct has occurred, it is important that any affected articles are retracted so that readers are not misled by fraudulent findings.

Another cause of tension is that journal editors also need to be informed if publications prove to be unreliable because of honest error (when a correction may be required, or even a retraction if the entire work is affected), or when there is insufficient evidence to find a researcher guilty of deliberate misconduct but clear evidence that there are problems with the work (in which case they may want to publish an 'Expression of Concern'). In these cases, institutions may be unwilling to inform journals, or may simply tell them that the researcher has been found "not-guilty", without answering questions about whether the publication can still be relied on. While the institution is interested in whether their employee committed misconduct, the journal is more interested in discovering whether material published in the journal could mislead readers, therefore the interests of the institution and the journal do not coincide.

Given the problems, both with journals failing to retract articles despite clear information that they were affected by misconduct, and with institutions being unwilling to pass information onto journals, COPE has produced guidance on this important relationship [18]. Liaison between journals and institutions was the topic of a series of sessions at the 3rd World Conference on Research Integrity in Montreal in 2013. The COPE guidelines were used as a

starting point for discussion, and the issues raised, and areas where further guidance is needed, will be published soon in the conference proceedings [19].

4.4 COPE guidelines
Another product of an earlier World Conference on Research Integrity (in Singapore in 2011) was a set of international guidelines for authors and editors that were developed with the help of COPE [20]. These guidelines were developed by a large, international group of researchers representing all academic disciplines and are designed to be adapted by journals or used as a link from their Instructions to Authors. COPE also promotes a Code of Conduct for Editors, and one for publishers, and expects all its members to follow this. More recently, COPE has produced guidelines for peer reviewers. All these documents are freely available (in English) on the COPE website (www.publicationethics.org), so it contains guidance for journal editors, publishers, authors, and peer reviewers on all aspects of publication ethics.

4.5 COPE discussion documents
Many questions of publication ethics require careful judgement and consideration of the particular circumstances. Although deliberate and serious cases of fraud are uncontroversial, some problems arise not through deliberate misconduct but because of ignorance or carelessness. Both academic institutions that employ and teach researchers, and academic journals that publish their work, need to respond proportionately, in other words, the type of response should depend on the seriousness of the misconduct. Therefore, it would be helpful not only to have clear definitions of different types of misconduct, but also consistent ways of measuring severity. For example, most people would agree that there is an important difference between senior researchers who take an article published by somebody else, put their own names on it and submit it to a new journal as if the work was their own, and a junior researcher who omits a single reference and fails to paraphrase a short passage of text in the Discussion section of an original article, yet both these actions might fall under the general category of plagiarism. In the case of the complete article, deliberately plagiarised, the correct response by the journal (if it had published the stolen work) would be to retract it. In the second case (of a short passage of unattributed text in the Discussion section), the correct response for the journal would probably be to issue a correction. Similarly, any disciplinary action by the authors' institution should depend on the severity of the case. These extreme cases (that is, the most serious and the most minor) are relatively easy to define, but those in between are often more difficult to handle.

The COPE flowcharts describe clear steps that editors should take when faced with different types of ethical problem. However, since many types of ethical problem require careful judgement, it is not always possible to describe exactly what an editor should do, and the response should depend on a careful assessment and understanding of the case. In such areas, where it is not possible to formulate exact policies, COPE produces discussion documents, to help editors and publishers understand the complexities of a subject. Recent discussion documents have focused on citation manipulation, authorship, and dealing with anonymous whistleblowers.

5 Authorship
One area of publication ethics that is associated with many problems is authorship [21]. Omitting a deserving author's name from an article may be considered similar to plagiarism (since this person is deprived of the credit for their work, which is taken by other people). Including somebody as an author who did not make sufficient contribution to deserve this is also dishonest and unfair, since authorship brings academic rewards (and sometimes even

direct monetary bonuses). However, journal editors must take authorship declarations on trust, since they usually have no way of knowing who actually contributed to the work being reported and submitted to their journal. Therefore, if there is a disagreement about authorship (for example, if somebody contacts the journal, after publication of an article, claiming that he or she deserved to be listed as an author), the editor must refer the dispute back to the authors' institution(s). Deciding who deserves to be an author, and the order in which they should be listed, can be difficult, and there are different conventions (especially about ordering) in different academic disciplines. As in most things, prevention is better than a cure, so training researchers about authorship conventions, encouraging good communication at all stages of a research project, and advising researchers on the importance of discussing authorship at an early stage are helpful, and institutions can help prevent problems by supporting such actions.

6 Responses to misconduct cases in Japan
No country is immune from research misconduct. Cases have occurred at prestigious institutions all over the world. It is probably unrealistic to believe that research and publication misconduct could ever be totally abolished. It is therefore important that institutions and publishers have good systems for handling suspected and proven cases. One encouraging sign is that some universities appear to be becoming more open and transparent in their proceedings and prepared to liaise with journals to ensure that faulty work is corrected or retracted. It is understandable that universities (and individual researchers) should wish to avoid bad publicity associated with misconduct cases, therefore it is especially creditable when they react correctly, investigate suspected cases thoroughly but promptly, and issue helpful public statements about their findings. Such correct handling of cases should be viewed, not as an embarrassment for the institution concerned but a sign that it has good procedures for research governance and responds appropriately when problems arise.

In the case of Dr Yoshitaka Fujii, an anaesthetist found to have fabricated data in a large series of publications, the six Japanese universities to which he had been affiliated swiftly assessed almost 300 papers after being alerted to suspected problems by a group of journal editors [22]. While it is unfortunate that the problems were not identified earlier, it is encouraging that the Japanese institutions reacted so constructively to the concerns of the journal editors so that the fraudulent publications could be retracted. In another case involving a Japanese researcher (Dr Naoki Mori), close cooperation between his institution (the University of Ryukyus in Okinawa) and the journal (Infection and Immunity) has been described. The editor noted 'The careful review performed by Dr. Mori's institution greatly facilitated our analysis', leading to the researchers' publications being retracted and Dr Mori being banned from publishing in journals published by the American Society for Microbiology for 10 years [23].

While no country would wish to have scandals relating to research misconduct, the resulting focus of attention on research integrity may bring benefits. In South Korea, following the highly publicised case of Dr Hwang Woo Suk involving cloning, the government and universities have placed greater emphasis on research integrity and one commentator described the incident as 'a wake-up call for many journals to police fraud more seriously' [24].

7 Conclusions
Information technology has had important impacts, both positive and negative on research and publication ethics. While some advances in technology have made it easier to commit

misconduct, such as "copy-paste" plagiarism, specific tools have also been developed that can be used to detect such problems. Journals are increasingly using software to screen submitted articles for plagiarism and image manipulation. Electronic publishing and indexing systems also make it possible to link corrections and retractions with affected publications, therefore alerting readers to problems in ways that were impossible in the print era. Despite advances in technology, publication ethics remains a complex and challenging area. Therefore journals and institutions need good policies and procedures. The Committee on Publication Ethics provides advice for journal editors, publishers, authors and peer reviewers. While journals are responsible for what they publish they are not equipped (either legally or physically) to investigate possible misconduct, therefore it is important that institutions inform journals about the findings of their investigations and cooperate with them to ensure that unreliable publications are retracted. While institutions (and journals) may be embarrassed by media reports of cases of misconduct, increased public attention may also bring benefits in terms of increased transparency and a wider understanding of the importance of research integrity.

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