Chapter 2. Ethics in Research

Table of Contents

Why does unethical research behaviour arise?

It happens, though very rarely, that researchers are tempted to falsify results or to steal ideas because of pressure to achieve more, or better, or faster. Another reason is for monetary gain, where the researcher has a financial interest in a particular product or company that will be affected by the research results. Lastly, unethical conduct can be a result of ignorance – for example, failing to prepare participants in an experiment appropriately, failing to negotiate agreements with external bodies, etc.

Unethical conduct in research

The worst type of unethical behaviour is deliberate deception - reporting experimental results which are fabricated or altered (falsification), or reporting others work or words as one's own (plagiarism). There are many other forms of unethical or unprofessional conduct in research, which can arise while doing the research, when performing experiments, in publishing results, or in handling misconduct. Unethical behaviour during research:

- Undertaking work despite a conflict of interest
- Ignoring proprietary rights
- Misuse of research funds
- Sexual harassment
- Incorrect reporting of publications in a curriculum vitae, funding request, etc.
- Malicious interference with the research of others
- Stealing data when permission to use it was refused

Unethical conduct in experiments:

- Compromising the privacy or confidentiality of subjects
- Secret observation or recording of the activities of others
- Risking harm to others
- Accessing confidential data in secret or otherwise breaching security
- Using inaccurate or unreliable data
- Destroying data or results so others cannot access them

Unethical publication:

- Stealing ideas
- Plagiarism
- Incorrectly attributing work/ideas to people not involved
- Claiming untrue, distorted or non-existent results
- Concealing known problems with the work reported
- Presenting work in an overly complex way
- Publishing the same idea(s) in multiple places

Inappropriate behaviour concerning accusations of misconduct:

- Failure to report unethical behaviour by others
- Malicious accusation of others
- Cover-ups of unethical practice
- Lack of due process when handling complaints of unethical
- behaviour
- Reprisals against those who identify unethical conduct

Plagiarism

Plagiarism is the stealing of words and ideas from others. This can take several forms - presenting research solutions, models, techniques and results as one’s own when they are taken from another source; repeating the words of others as if they were one’s own; duplicating paragraphs or sentences from another text but changing the actual words to make it appear different; etc. One way of knowing whether you are plagiarizing a document or not, is to check whether you are typing in your own text while looking at that work (rather than typing your own thoughts or your own notes); if so, you are directly or indirectly using their material and presenting it as your own. Once research has been published, it becomes part of the body of knowledge and can be used and referred to by others – who must acknowledge the source by an appropriate citation. Before that, if ideas are taken from work seen in privileged grant applications, research proposals or manuscripts, to use the idea is to steal intellectual property. Research remains private property until publicly published or disseminated.

Multiple publications

It is unethical to publish the same paper in two different places, or to publish two very similar papers. It is equally unethical to submit the same, or very similar papers, to more than one journal/conference

at a time (even if acceptance rates are low or slow). If more than one paper is published as a result of a single piece of research, each should have a unique idea not present in any of the others, and each should reference the others to make the connection explicit. Multiple publications that cover virtually identical material are unethical, and can perhaps also be attributed to pressure to build up a certain number of publications. Many funding agencies and academic institutions now focus on applicants' best three to five recent papers, and pay less attention to the sheer volume of publications.

Accusations of unethical conduct

Unethical research practice places one's entire research career at risk, and also the reputation of one's institution. Such mistakes become known outside the research community, can involve the press or even civil courts, and thus adversely affect the entire discipline.

When a researcher is accused of unethical behaviour, this can potentially damage not only the individual(s) concerned but also their institution, students, team members, sponsors, collaborators and clients, as well as journals/proceedings where the work was published, and the person(s) making the accusation. The process whereby such accusations are handled needs to ensure fair treatment of all these parties. They should only be informed of the potential problem after a preliminary investigation has been conducted that indicates that a valid case may indeed exist. The outcome of the preliminary investigation should determine which parties might be affected and should be informed.

During a preliminary investigation the accused has the right to protection and due process (e.g. reviewing the evidence). The identity of the person making the accusation should be confidential, and the accused individuals should be informed in writing before any investigation, even preliminary checks, are instigated.

Since the impact of misconduct is so great, anyone who becomes aware of such behaviour has a duty to report it. This can be very difficult, as it is difficult to guarantee anonymity. It is best to discuss the issue with a colleague before putting any accusation in writing – once it is in writing, authorities are obliged to act and to act publicly. Many institutions appoint an official or committee to be in charge of research ethics, who are the best people to approach.

Institutional responsibilities

Universities and other research institutions need to frame codes of conduct for research practice, to safeguard against such situations. These must also provide protection for individuals accused of unethical conduct, to ensure they are justly able to address such accusations and avoid prejudicial treatment, with proper procedures set up to deal with complaints. This will also reduce the risk of the institution needing to resort to the courts to settle such problems.

An institution where research is undertaken needs to appoint a body to give confidential advice in cases of suspected misconduct, and an individual/group to whom formal accusations are submitted. Should the accusation be considered plausible by this group, they take over the responsibility of setting in motion appropriate procedures to handle the allegation and to safeguard the rights of all involved.

If an accusation of unethical conduct is found, after due process, to be invalid then the individuals accused should be informed immediately and their record should reflect this outcome in a way agreed to by the institution and the individuals, so as to be as satisfactorily dealt with as possible from the viewpoint of those wrongly accused. If an allegation of unethical behaviour is upheld after a fair and thorough investigation, then innocent people who have been affected should be assisted as much as possible, and financially compensated where appropriate.

Three places to give credit in a publication

In the world of research, it is crucial to give credit wherever credit is due. In a paper, credit is given in three places – the list of authors, the acknowledged contributions from others, and the list of references. It is generally accepted that the earlier a name appears in the list of authors, the more prominent the role

of that person in the research, and equal contributors are listed in alphabetical order. Where people or organisations have assisted in lesser ways, including acquisition of data or funding, their input should be stated in the acknowledgements section. This includes those paid for their contribution, such as technical officers and the like. References place a piece of research in context, by relating it to work that supports the same or alternative views, and acknowledging others' ideas that have been used or modified. These citations are important for researchers, as citation counts have a strong influence on, for example, an individual's access to funding, promotion, or appointment to an academic/research post.

Who should be credited

Modern research projects have grown in size and complexity, and it is common for large teams to work together, and thus for several authors to be named on a paper. Authorship of papers should be discussed by a research team early in a project, and reviewed when there are changes to the project plan, to make sure that the correct people are acknowledged as contributors for each output. If a senior researcher has defined and initiated a project in which a junior has subsequently participated, the senior researcher gets the major credit for their discoveries. At the same time, where a junior makes an important research contribution in their own right, the senior researchers with whom that person works must recognize them as major contributor in those publications.

Undeserved credit

An author should at least be involved in the conception, design, implementation or analysis of the work presented in the paper, have played a part in writing or revising the article, and have agreed to its publication in that form under their name. Participation by virtue of position alone (as group leader or supervisor for instance) is not an acceptable reason for naming someone among the authors or a paper; doing so is deliberately misleading others and falsely giving the individual recognition that is undeserved. Yet in some research groups, the leader's name appears on every paper published by the group; and in many departments the supervisor's name appears on every paper produced by students s/he supervises. Sometimes a person is added to a list of authors when they had little if any involvement with the work being reported there (but it is politic to include them for extraneous reasons).

When listing their publications in a CV, grant proposal or the like, researchers must make clear distinctions between submitted, accepted and published works; and between refereed and non-refereed publications. Similarly, correctly distinguishing between applications and grants is essential when referring to current or planned research.

Agreement from authors

When the work of a research team is reported, a primary author (sometimes called an "executive author" or "chief author") must be selected, and given the role of ensuring that the correct authors are listed, that all authors agree to submitting the final draft under their name, and that all necessary acknowledgements are included. A letter to this effect should be signed by all authors and kept on file, to guard against possible future disputes. Some journals require all named authors to sign a form stating that they contributed substantially to the work and are (jointly) accountable for what appears in the paper. Someone who is willing to take part of the credit for a publication must also be prepared to take responsibility for the mistakes, and should not try to hide behind an excuse that they were not involved in the section at fault. If this is indeed the case, a footnote indicating involvement in different sections should have been included in the paper from the outset.

Ethical conduct for researchers

Consideration of possible ethical issues is an essential part of research. Researchers must be aware of and adhere to sound ethical practice in their work, with respect for honesty and truthfulness, privacy and confidentiality. It is assumed by all institutions conducting research that their staff are aware of

their responsibility towards the profession and the public to be ethical in their experimentation and reporting. Researchers should only participate in work which they are competent to do; they should seek out criticism and debate, should publish and present their work widely, so that the research can benefit from scrutiny and elaboration by their peers. Professional bodies like the Association for Computing Machinery and others provide a code of ethics for their members. Most institutions have policies governing such conflicts of interest, to protect their integrity and public confidence in their research.

Peer review safeguards

The process of review and revision that precedes publication is critical in preventing an individual's subjectivity from influencing accepted knowledge. It is also a powerful way of ensuring that researchers are more thorough and careful in the conduct and presentation of their work. The use of identical or similar techniques to prove conclusions give rise to accepted standards for research methods and methodologies.

Until well into the seventeenth century, scientists were reluctant to advertise their findings because others would claim to have had the idea first. Then Henry Oldenburg, secretary of the Royal Society of London, pioneered the practice of peer review and scientific journals – he guaranteed rapid publication in the society's Philosophical Transactions, and the support of the society if priority came into question. Irrespective of who discovers a result, idea or technique first, it is the first to publish it who is recognized as its originator, and who gets the credit in all subsequent citations.

Research results and the general public

The consequences of research are impossible to foresee. Nevertheless, the team has a duty to consider the possible social implications of their technique/results and to draw the community's attention to these if they are cause for concern. One possibility is to arrange a public debate or discussion panel, and to use this to find a consensus view.

Research results should not be disclosed to the public via the media, on the Internet, or at gatherings before they have been accepted by peer review. It is irresponsible to broadcast findings without having them screened by some quality-control mechanism. Releasing controversial results in this way risks misinterpretation and over-reaction to results that may prove incorrect. Where issues of concern make such prior notice advisable, the unpublished nature of the results must be clearly reported at the same time; and appropriate public authorities should be approached rather than the general press. It is only where public authorities fail to react that the media should be informed of such results, and again it is imperative that the unpublished, unvetted nature of the work be indicated at that time.

Data Availability

Once research has been published, scientists are expected to make available their data and results for others to share. Someone who fails to do so should not be trusted or respected. Data used in published work should be available for other researchers to use or to discuss. It should also be kept for a suitable period (depending on the project, typically about 5 years) for examination in the event of any complaints or accusations following publication. Institutions should provide guidelines on ownership and access rights to databases, particularly where confidential information is concerned. Researchers are responsible for enforcing security.

Unlike other fields, such as medicine, computer science does not have widely accepted standards for recording experiments [Zobel97]. In any science, records should include the purpose of the experiment, descriptions of the apparatus and any modifications to it before or during the experiment, the date(s) it was conducted, data collected including rough notes, analysis performed and conclusions drawn. Records are important because they are the only lasting evidence of the experiment, and because the discipline of maintaining these properly generally introduces greater rigour and reproducibility. Records will vary depending on the type of experiment, e.g. whether human factors

are being assessed or execution timings. Recording the latter reliably for example requires knowledge of hardware, operating systems and cache behaviour. Appropriate choice of hardware and software platform, test data sets and system parameters for running such experiments can be critical and must be documented. And of course in computer science the program code is typically an essential part of the experiment - yet it is often lost, or if it exists then either it is only the final version that was kept, or else several versions exist and it is not known which was used in which experiment. In addition to researchers' notes, all code versions should be kept, as well as logs or audit trails of outputs (along with corresponding inputs) [Zobel97]. This is useful to the researcher in any event, e.g. for later writing up the work for publication or for performing new analyses.

Patents and Agreements

Research which has the potential to be financially rewarding can be safeguarded through application for patents. This enables the researchers or their institution to profit from the idea while at the same time introducing it into the public domain. Those doing patentable work can be required to take extra measures, such as having their notes validated and dated, to ensure that discoveries are timeously reported to the patent official of the institution sponsoring the work. Where research sponsored by industry or the military cannot be publicly disclosed at all, summaries may be publishable and if so should be scrutinized in privacy by visiting committees.

Where research is conducted in collaboration with an external body, agreements regarding intellectual property rights, confidentiality and any limitations on publication need to be made at the outset, and endorsed by the researcher, their university/institution, the external groups and funders.

Ethics in observations

If participants in an experiment are being observed by others, they should be informed about this beforehand. In most cases, any reticence this causes falls away once the subject becomes immersed in the task at hand. The Internet has given rise to a new form of hidden observation. There is now an increasing number of systems that log Internet activities such as user interactions, site navigation, chatroom and bulletin board conversations, etc. Individuals can be unaware that this information is being collected, which raises new problems regarding confidentiality and privacy. Such systems should notify users of the logging in advance, just as in other user studies.

Confidentiality

Since much of research involves gathering information, it is important that this activity respects the privacy of individuals. Anonymity should be assured wherever possible; i.e. no data collected that can identify individuals; however this can be impractical e.g. where studies involve tracking individuals over time. Data collected about people should never be disclosed without their prior consent. The identity of an individual should also not be deducible from reports (e.g. by referring to a personal characteristic that is unique in the sample).

Contracts in experimentation

The principle of informed consent ensures that participants understand in advance what procedures they will be involved in. Participants should be guaranteed that they will not be physically or psychologically harmed. By the principle of voluntary participation, people should not be forced into participating in research experiments, as is sometimes the case with “captive audiences” at educational institutions, prisons and the like.

Ethical research requires being clear about the agreement between researcher and participant, and then adhering to this. Contracts are useful in clarifying this and in obtaining proper consent from participants in surveys, interviews, experiments and case studies, and from those providing you with data of any kind. It is best to ensure that people participating in a research experiment first sign a consent form which states the purpose of the project, the tasks they will be performing and the

confidentiality/anonymity guaranteed. Adding that a subject can withdraw from the experiment at any time is also advisable.