

# Understanding Scientific Misconduct and Ethics in Research and Publication

Technical  
Communication

Week 6

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- Part 1: Ethics in Research and Publication
- Part 2: Paraphrasing, summarising and quoting

# Part 1: Ethics in Research and Publication

# Preface

- The importance of ethical conduct and its awareness is relevant, whether:

You are just starting out in your career

or

You are a more seasoned researcher

- Plagiarism, research fraud, undisclosed competing interests

Just a few of the issues that can threaten not only the integrity of the science,

but

Also one's standing in the scientific community

# Preface

- An understanding of the ethical boundaries and "rules" is paramount  
to ensuring your work and career get off to the best start possible
- It is with this in mind that the enquiry into Ethics in Research & Publication  
is relevant for both early-career researchers

# Overview

- Authorship
- Competing Interests
- Plagiarism
- Simultaneous submission
- Research fraud
- Salami Slicing

# Authorship

- Naming authors on a scientific paper ensures  
that the appropriate individuals get credit  
and are accountable for the research
- Deliberate misrepresentation of a scientist/researcher's relationship to their work  
is considered to be a form of misconduct that undermines confidence in the reporting of the work itself
- While there is no universal definition of authorship,  
an “author” is generally considered to be an individual who has made a significant intellectual  
contribution to the study

# Authorship

Four criteria must all be met to be credited as an author:

- Substantial contribution to the study conception and design, data acquisition, analysis, and interpretation.
- Drafting or revising the article for intellectual content.
- Approval of the final version.
- Agreement to be accountable for all aspects of the work related to the accuracy or integrity of any part of the work.



# Authorship

- The following are some general guidelines, which may vary from field to field:
  - The order of authorship should be "a joint decision of the coauthors".
  - Individuals who are involved in a study but don't satisfy the journal's criteria for authorship, should be listed as "Contributors" or "Acknowledged Individuals"
    - Examples include: assisting the research by providing advice, collecting data as assistants paid for their services, providing research space, departmental oversight, and obtaining financial support.
  - For a large team, it is typically published, along with a statement of the individual contributions made.
  - Some groups list authors alphabetically, sometimes with a note to explain that all authors made equal contributions to the study and the publication.

# Authorship

Three types of authorship are considered unacceptable:

- "Ghost" authors, who contribute substantially but are not acknowledged (often paid by commercial sponsors);
- "Guest" authors, who make no discernible contributions, but are listed to help increase the chances of publication;
- "Gift" authors, whose contribution is based solely on a tenuous (negligible) affiliation with a study

# Authorship

- When not appropriately addressed, authorship issues can lead to dispute.
  - Some disputes are based on misconduct (such as lying about one's role);
  - Some stem from questions of interpretation, such as the degree to which a person's contribution can be considered "substantial," and if authorship is justified.
- Other potential issues could include:
  - being involved in a study, but not listed as an author or contributor;
  - someone taking your idea and publishing a paper claiming full authorship;
  - and finding your name on a publication without your permission.
- If a complaint is filed over a dispute,
  - an investigation may be conducted with the journal editor and author's institution to reach a resolution.

# Authorship

- Because of the potential for ambiguity and confused expectations,
  - it is strongly advised that before the research begins,
  - a meeting take place to document how each person will be acknowledged.
- Issues around authorship can be complex and sensitive
  - Early career researchers who encounter such situations may fear they will jeopardise their reputation and career if they speak up
  - Take the time to fully understand each journal's guidelines for authorship, and industry requirements
  - If you find yourself in a challenging situation that you are not sure how to handle, consult with a trusted mentor or supervisor

# Competing Interests

**Transparency and objectivity are essential in scientific research and the peer review process.**

When an investigator, author, editor, or reviewer has a financial/personal interest or belief that could affect his/her objectivity, or inappropriately influence his/her actions, a potential competing interest exists.

Such relationships are also known as dual commitments, competing interests, or competing loyalties.

The most obvious competing interests are financial relationships such as:

- Direct: employment, stock ownership, grants, patents.
- Indirect: honoraria, consultancies to sponsoring organisations, mutual fund ownership, paid expert testimony .

Undeclared financial interests may seriously undermine the credibility of the journal, the authors, and the science itself.

An example might be an investigator who owns stock in a pharmaceutical company that is commissioning the research.

# Competing Interests

Competing interests can also exist as a result of personal relationships, academic competition, and intellectual passion. An example might be a researcher who has:

- A relative who works at the company whose product the researcher is evaluating.
- A self-serving stake in the research results (e.g. potential promotion/ career advancement based on outcomes).
- Personal beliefs that are in direct conflict with the topic he/she is researching.

Some considerations that should be taken into account include:

- whether the person's association with the organisation interferes with their ability to carry out the research or paper without bias; and
- whether the relationship, when later revealed, make a reasonable reader feel deceived or misled.

# Plagiarism

One of the most common types of publication misconduct is plagiarism

—when one author deliberately uses another's work without permission, credit, or acknowledgment.

Plagiarism takes different forms, from literal copying to paraphrasing some else's work and can include:

- Data
- Words and Phrases
- Ideas and Concepts

Plagiarism has varying different levels of severity, such as:

- How much of someone's work was taken—a few lines, paragraphs, pages, the full article?
- What was copied—results, methods, or introduction section? .

When it comes to your work, always remember that crediting the work of others (including your advisor's or your own previous work) is a critical part of the process.

You should always place your work in the context of the advancement of the field, and acknowledge the findings of others on which you have built your research.

Action	What is it?	Is it unethical?	What should you do?
<b>Literal Copying</b>	Reproducing a work word for word, in whole or in part, without permission and acknowledgment of the original source.	<p><b>Yes.</b></p> <p>Literal copying is only acceptable if you reference the source and put quotation marks around the copied text.</p>	<p>Keep track of sources you used while researching and where you used it in your paper.</p> <p>Make sure you fully acknowledge and properly cite the original source in your paper.</p> <p>Use quotation marks around word-for-word text and reference properly.</p>
<b>Substantial copying</b>	This can include research materials, processes, tables, or equipment	<p><b>Yes.</b></p> <p>"Substantial" can be defined as both quantity and quality of what was copied. If your work captures the essence of another's work, it should be cited.</p>	<p>Ask yourself if your work has benefited from the skill and judgment of the original author?</p> <p>The degree to which you answer "yes" will indicate whether substantial copying has taken place. If so, be sure to cite the original source.</p>



<p><b>Paraphrasing</b></p>	<p>Reproducing someone else's ideas while not copying word for word, without permission and acknowledgment of the original source.</p>	<p><b>Yes.</b></p> <p>Paraphrasing is only acceptable if you properly reference the source and make sure that you do not change the meaning intended by the source.</p>	<p>Make sure that you understand what the original author means.</p> <p>Never copy and paste words that you do not fully understand.</p> <p>Think about how the essential ideas of the source relate to your own work, until you can deliver the information to others without referring to the source. Compare your paraphrasing with the source, to make sure you retain the intended meaning, even if you change the words.</p>
<p><b>Text-recycling</b></p>	<p>Reproducing portions of an author's own work in a paper, and resubmitting it for publication as an entirely new paper.</p>	<p><b>Yes.</b></p> <p>See our separate factsheet on duplicate submission.</p>	<p>Put anything in quotes that is taken directly from a previously published paper, even if you are reusing something in your own words. Make sure to reference the source accordingly.</p>

# Simultaneous Submission

Authors have an obligation to make sure their paper is based on original

—never before published—research.

Intentionally submitting or re-submitting work for duplicate publication is considered a breach of publishing ethics.

- Simultaneous submission occurs when a person submits a paper to different publications at the same time, which can result in more than one journal publishing that particular paper.
- Duplicate/multiple publication occurs when two or more papers, without full cross-reference, share essentially the same hypotheses, data, discussion points, and/or conclusions.
  - This can occur in varying degrees: literal duplication, partial but substantial duplication, or even duplication by paraphrasing.

One of the main reasons duplicate publication of original research is considered unethical,

- is that it can result in "inadvertent double- counting or inappropriate weighting of the results of a single study, which distorts the available evidence".

# Simultaneous Submission

## Points to remember:

- articles submitted for publication must be original and must not have been submitted to any other publication.

At the time of submission,

- authors must disclose any details of related papers (also when in a different language), similar papers in press, and translations.

While the boundaries around duplicate publication may vary from field to field,

- all publishers have requirements for submitting papers.

It's a good idea to make sure you fully understand them to avoid violating the process.

Action	What is it?	Is it unethical?	What should you do?
<b>Simultaneous submission</b>	Submitting a paper to two or more journals at the same time.	<p><b>Yes.</b></p> <p>Submission is not permitted as long as a manuscript is under review with another journal.</p>	<p>Avoid submitting a paper to more than one publication at a time.</p> <p>Even if a submitted paper is currently under review and you do not know the status, wait to hear back from the publisher before approaching another journal, and then only if the first publisher will not be publishing the paper.</p>
<b>Duplicate publication</b>	When an author submits a paper or portions of his or her own paper that has been previously published to another journal, without disclosing prior submission(s)	<p><b>Yes.</b></p>	<p>Avoid submitting a previously published paper for consideration in another journal.</p> <p>Avoid submitting papers that describe essentially the same research to more than one journal.</p> <p>Always provide full disclosure about any previous submissions (including meeting presentations and posting of results in registries) that might be regarded as duplicate publication.</p> <p>This should include disclosing previous publication of an abstract during the proceedings of meetings</p>

<p><b>Duplication by Paraphrasing or "Text-recycling"</b></p>	<p>When an author writes about his or her own research in two or more articles from different angles or on different aspects of the research without acknowledgment of the original paper.</p>	<p><b>Yes.</b></p> <p>Creating several publications from the same research, is considered manipulative.</p>	<p>Put anything in quotes that is taken directly from a previously published paper, even if you are reusing something in your own words. Make sure to reference the source accordingly.</p>
<p><b>Translations of a paper published in another language</b></p>	<p>Submitting a paper to journals in different languages without acknowledgment of the original paper.</p>	<p><b>Yes.</b></p> <p>Translated articles are acceptable when all necessary consents have been obtained from the previous publisher of the paper in any other language and from any other person who might own rights in the paper.</p>	<p>If you want to submit your paper to journal that is published in a different country or a different language, ask the publisher if this is permissible. At the time of submission, disclose any details of related papers in a different language, and any existing translations.</p>

# Research Fraud

Research fraud is publishing data or conclusions that were not generated by experiments or observations, but by invention or data manipulation.

There are two kinds in research and scientific publishing:

- Fabrication. Making up research data and results, and recording or reporting them.
- Falsification. Manipulating research materials, images, data, equipment, or processes.

Falsification includes changing or omitting data or results in such a way that the research is not accurately represented. A person might falsify data to make it fit with the desired end result of a study.

Both fabrication and falsification are serious forms of misconduct because they result in a scientific record that does not accurately reflect observed truth.

Action	What is it?	Is it unethical?	What should you do?
Manipulating data	Intentionally modifying, changing, or omitting data.	Yes	<p>Never tamper with or change data.</p> <p>Keep meticulous records of your data.</p> <p>Records of raw data should be accessible in case an editor asks for them-even after your paper has been published.</p> <p>Understand the publisher's policies on data before you submit a paper.</p>
Manipulating Data Images	This can include research materials, processes, tables, or equipment.	<p><b>Yes.</b></p> <p>Your manuscript may be rejected if the original data are not presented or misrepresented.</p>	<p>If you need to adjust an image to enhance clarity, make sure you know what is considered acceptable before submitting your paper.</p> <p>Even if the image manipulations are considered acceptable, report it to the publication prior to submitting your paper.</p> <p>Review any data images used to support your paper against the original image data to make sure nothing has been altered.</p>

# Salami Slicing



Image taken from wikipedia commons

- The “slicing” of research that would form one meaningful paper into several different papers is called "salami publication" or "salami slicing".
- Unlike duplicate publication, which involves reporting the exact same data in two or more publications, salami slicing involves breaking up or segmenting a large study into two or more publications.
  - These segments are referred to as "slices" of a study.
- As a general rule, as long as the "slices" of a broken up study share the same hypotheses, population, and methods, this is not acceptable practice.
  - The same "slice" should never be published more than once.



Action	What is it?	Is it unethical?	What should you do?
Breaking up or segmenting data from a single study and creating different manuscripts for publication	Publishing small 'slices' of research in several different papers is called 'salami publication' or 'salami slicing'.	<p><b>Yes.</b></p> <p>Salami slicing can result in a distortion of the literature by leading unsuspecting readers to believe that data presented in each 'slice' is derived from a different subject sample.</p>	<p>Avoid inappropriately breaking up data from a single study into two or more papers.</p> <p>When submitting a paper, be transparent. Send copies of any manuscripts closely related to the manuscript under consideration.</p> <p>This includes any manuscripts published, recently submitted, or already accepted.</p>

## Part 2: Paraphrasing, summarising and quoting

# Paraphrasing, Quoting, and Plagiarism

## Paraphrasing

- Paraphrasing means expressing information or ideas from other sources in your own words in a similar number of words as the source text.
- Paraphrasing is NOT simply replacing words with synonyms or rearranging the structure of sentences.
- It involves rephrasing a text substantially while retaining the original meaning.
- Paraphrasing involves acknowledging the original source with proper referencing

A paraphrase is particularly useful:

- when you are dealing with facts and definitions
- when you need to refer to a chunk of information from one particular part of a source (e.g. a paragraph in the introduction of a journal article).

## Why Should You Paraphrase?

“Paraphrasing” is expressing the meaning of someone else’s words in your own words instead of quoting directly.

By paraphrasing effectively, you can:

save space and keep your study more focused

distill complex information into language that general readers can understand

avoid plagiarism and provide your own authorial voice in your paper

## How to paraphrase?

The first step in paraphrasing is to read the original text and get a full grasp of it.

You may need to read the original text a few times and check the meaning of key words to fully understand it.

While you are reading, think about the overall meaning of each paragraph or section  
just don't just focus on the individual words and sentences.

After each paragraph or section, put the reading aside and state it in your own words.

When you can do this, you are ready to write your paraphrase.

Finally, proofread, revise and edit your paraphrase as necessary.

Please include a proper citation when paraphrasing and be careful not to change the author's meaning.

## Incorrect Paraphrasing

Incorrect paraphrasing is another way plagiarism can be present in an author's writing.

Incorrect paraphrasing is usually when an author replaces just a word or two of a source's phrasing with synonyms.

This type of paraphrasing does not show enough understanding and engagement with the text.

Instead, the author needs to strive to take ideas and information and place them in his or her own words.

Two common characteristics of incorrect paraphrasing includes when the paraphrased version:

- Has the same sentence structure as the original and

- Has key words from the original that the author simply rearranged or replaced.



## **Changing Source Text into a Paraphrase**

**Step 1:** Read important parts of the source material until you fully understand its meaning.

**Step 2:** Take some notes and list key terms of source material.

**Step 3:** Write your own paragraph without looking at the source material, only using the key terms.

**Step 4:** Check to make sure your version captures important parts and intent of the source material.

**Step 5:** Indicate where your paraphrasing starts and ends using in-text citation.

## **Paraphrasing Checklist**

Write the paraphrased statement in your own words.

Always include a citation with a paraphrase—you are still using someone else's ideas

When you use a direct quote, be sure to clarify the quote to show why you have included it.

Avoid using blocks of quoted text, especially in papers on the natural sciences.

You can almost always use a paraphrase/quote combination instead.

Overall, focus on *your* study first—any extra information should be used to enhance your arguments or clarify your research.

Here is the original source an author might use in a paper:

Differentiation as an instructional approach promotes a balance between a student's style and a student's ability. Differentiated instruction provides the student with options for processing and internalizing the content, and for constructing new learning in order to progress academically.

Thompson, 2009

Differentiation as an instructional approach promotes a balance between a student's style and a student's ability. Differentiated instruction provides the student with options for processing and internalizing the content, and for constructing new learning in order to progress academically.

Differentiation is a way to encourage equality between the approach and talent of the student (Thompson, 2009). This type of instruction gives students different ways to deal with and grasp information, and for establishing new learning to move on in education (Thompson, 2009).

- How is the paraphrasing done?
- An example of bad paraphrasing of the source.
- Even though the author is citing correctly, underlined words are simply synonyms of words used in the original source.
- You can also see how the sentence structure is the same for both the original source and this paraphrase.

Differentiation as an instructional approach promotes a balance between a student's style and a student's ability. Differentiated instruction provides the student with options for processing and internalizing the content, and for constructing new learning in order to progress academically.

Differentiation is a way to encourage equality between the approach and talent of the student (Thompson, 2009). This type of instruction gives students different ways to deal with and grasp information, and for establishing new learning to move on in education (Thompson, 2009).

Teachers use differentiated instruction to help students learn, allowing the teacher to cater lessons to the way each student learns and each student's skill (Thompson, 2009).

So, why is this an example to note a better way to paraphrase the source:

- In this example,
  - the author has taken the essential ideas and information from the original source,
  - but has worded it in her/his own way, using unique word choice and sentence structure.
- 
- The author has condensed Thompson's (2009) information,
  - including what is relevant to her/his paper,
  - but leaving out extra details that she does not needed.

You should paraphrase...	You should use direct quotes...
<ul style="list-style-type: none"> <li>• to show you understand the main ideas/arguments of the author</li> <li>• to help explain difficult concepts or terminology</li> <li>• to highlight original <i>ideas</i> that are interesting when the original <i>language</i> is not as interesting</li> <li>• to change the <i>emphasis</i> of information to match your own arguments</li> <li>• to provide a clear “voice” in your paper that isn’t directly connected to other works</li> </ul>	<ul style="list-style-type: none"> <li>• when the original wording is strong and engaging</li> <li>• if the quote is very well-known or difficult to paraphrase well</li> <li>• where the exact words of an authority would lend support to your own ideas</li> <li>• when you want to present the author’s detailed methods or findings or exact stated position</li> </ul>



Quoting means repeating the author's exact words.

In some disciplines, such as literary studies and history, quoting is used frequently to support an argument. In most others, especially science and technology, it is used sparingly, if at all.

Make sure you understand how quoting is used (with respect to the referencing style).

Keep the quote as brief as possible, and integrate it into the development of your argument or discussion.

This means commenting on the quote to show how it connects to your point.

All quotes require page numbers in the citation.

Some situations which might justify direct quoting could be:

- the author has devised and named a new theory, model, concept, technique or scale
- the author has provided a definition of a concept
- the author's words have unusual impact and would be difficult to express in any other way
- the author is a notable authority on the subject and their words will lend weight to your argument
- you are expected to use examples to justify your interpretation or analysis of a literary work

There are two broad types of citation; information-prominent and author-prominent.

**Information-prominent citation** is used when **what** (i.e. the information) you want to convey is more important to your purpose than telling the reader **who** (i.e. the author) wrote that information. In this case the citation follows the content.

For example:

In this case the citation follows the content.

For example:

By focusing on the observable manifestations of mental processes, natural science is at risk of being defined too narrowly as the “science of meter reading”, thereby diminishing the importance of the underlying cognitive processes that behaviour is based on (Chomsky, 2006, p. 57).

**Author-prominent citation** is used when the primary importance is given to **who** (i.e. the author) has written the information, findings or opinion you are presenting in your writing rather than **what** is presented. In this case the author is usually mentioned in the subject of the sentence. Instances when author-prominent citation are useful include:

- when the author is a noted authority on the topic
- when tracing the historical or chronological development of new thinking or discoveries
- when comparing differing expert opinions.

For example:

The eminent linguist, Noam Chomsky has warned that a narrow definition of the natural sciences as the ‘science of meter reading’, fails to acknowledge the complex cognitive processes that observable behaviour is based on (2006, p. 57).

## **General Formatting Rules for Quoting and Paraphrasing**

**Direct Quote:** simply a “copy-and-paste” of the original words and/or word order.

In all research papers with formatting guidelines (APA, AMA, MLA, Harvard etc.), quoted text must be accompanied by quotation marks and in-text citation.

**Paraphrasing:** Can include some key terms from the original work, but must use new language to represent the original work—DO NOT COPY THE ORIGINAL WORK.

When you paraphrase, you do not need to include quotations marks, but you must still cite the original work.

## Summarising

Summarising means briefly outlining the main points of a reading in your own words without adding your own ideas or changing the author's meaning.

Summarised information must be accompanied by a citation.

A summary is particularly useful if you need to refer to the main idea/argument presented in a source (e.g. a book/chapter/article, etc.).

How to summarise?

Similar to paraphrasing, the first step in summarising is to read the original text and get a full grasp of it.

You may need to re-read the original source a few times and look up the meaning of key words to fully understand it.

When reading, ask yourself: What is the overall message? What are the key points?

Concentrate on the essentials and leave out details and examples.

Put the source aside and state its key points in your own words.

When you can do this, you are ready to write your summary.

Finally, proofread, revise and edit your summary as necessary.

Don't forget to include a proper citation when summarising and be careful not to add new points or change the original meaning.

## Select References

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