RESEARCH ETHICS

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AGENDA

- Definition & Background

- Principles of Research Integrity

- Types and Examples of Scientific Frauds

- In-Class Activity (No submission): Case Study Examples

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What is Ethics???

What is Research Ethics???

Research Ethics

Research ethics are the set of ethics that govern how scientific research is performed at research institutions such as universities, and how it is disseminated.

Doctors Trial: 1946-1947

- Segment of the Nuremberg Trials for Nazi war criminals

- 23 German Nazi physicians were accused of conducting torturous "experiments"

- Experiments involved gathering scientific information about the limits of the human body by exposing victims to extreme temperatures.

Ref: University of Minnesota Center for Bioethics. "A Guide to Research Ethics." (2003).

Milgram Experiment: 1961

BASED ON MILGRAM SHOCK EXPERIMENT DONE IN THE EARLY 1960's
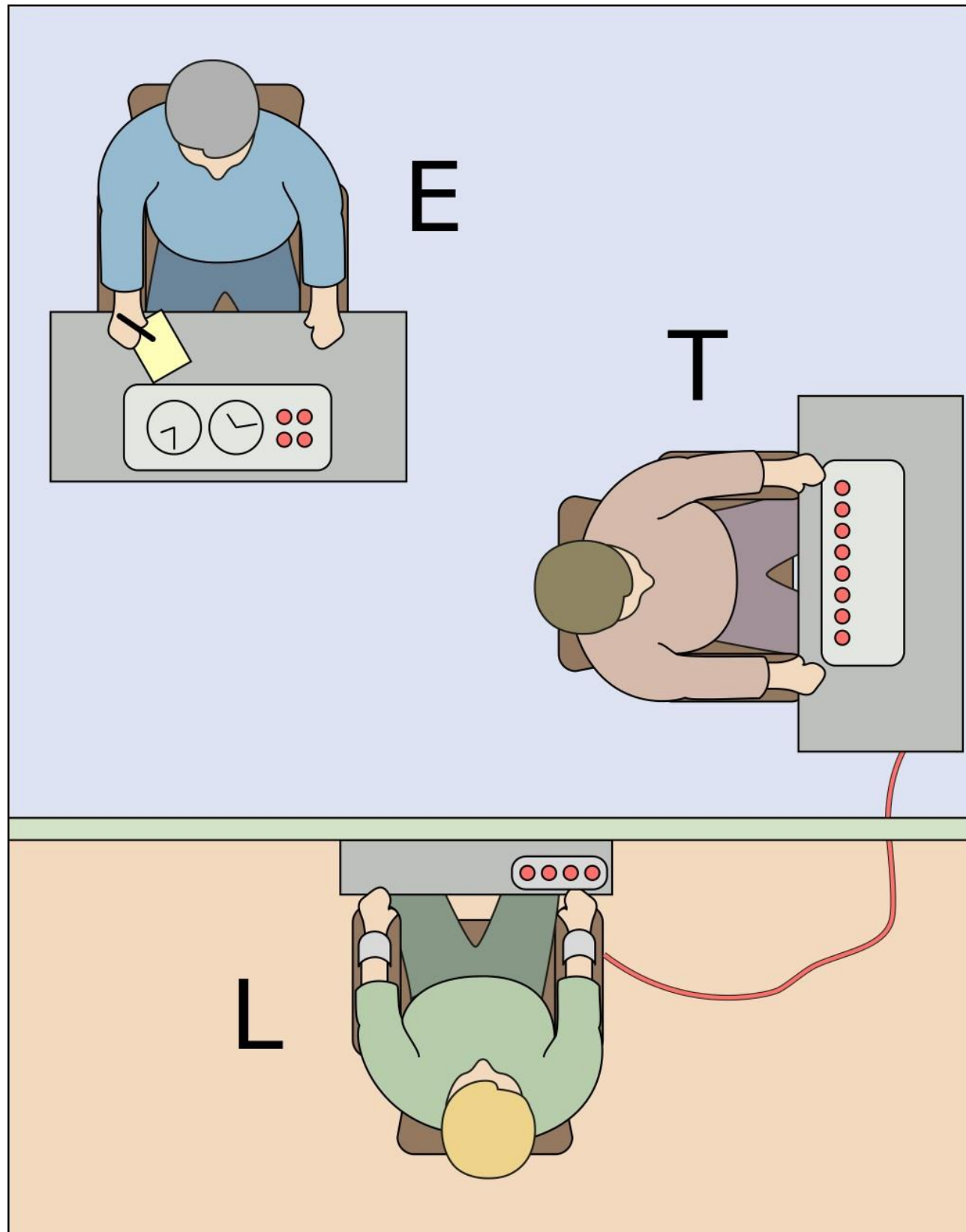
THE EXPERIMENT AIMED TO TEST HUMANS' WILLINGNESS TO OBEY ORDER FROM A SUPERIOR EVEN IT'S HARMING SOMEONE ELSE

THE EXPERIMENTER (E) ADMINISTERS THE SESSION. PARTICIPANT/TEACHER (T) IS ASKED TO PROVIDE PAIRS OF WORDS THAT THE LEARNER (L) NEEDS TO MEMORISE. WHENEVER L MAKES A MISTAKE T ADMINISTERS ELECTRIC SHOCK.
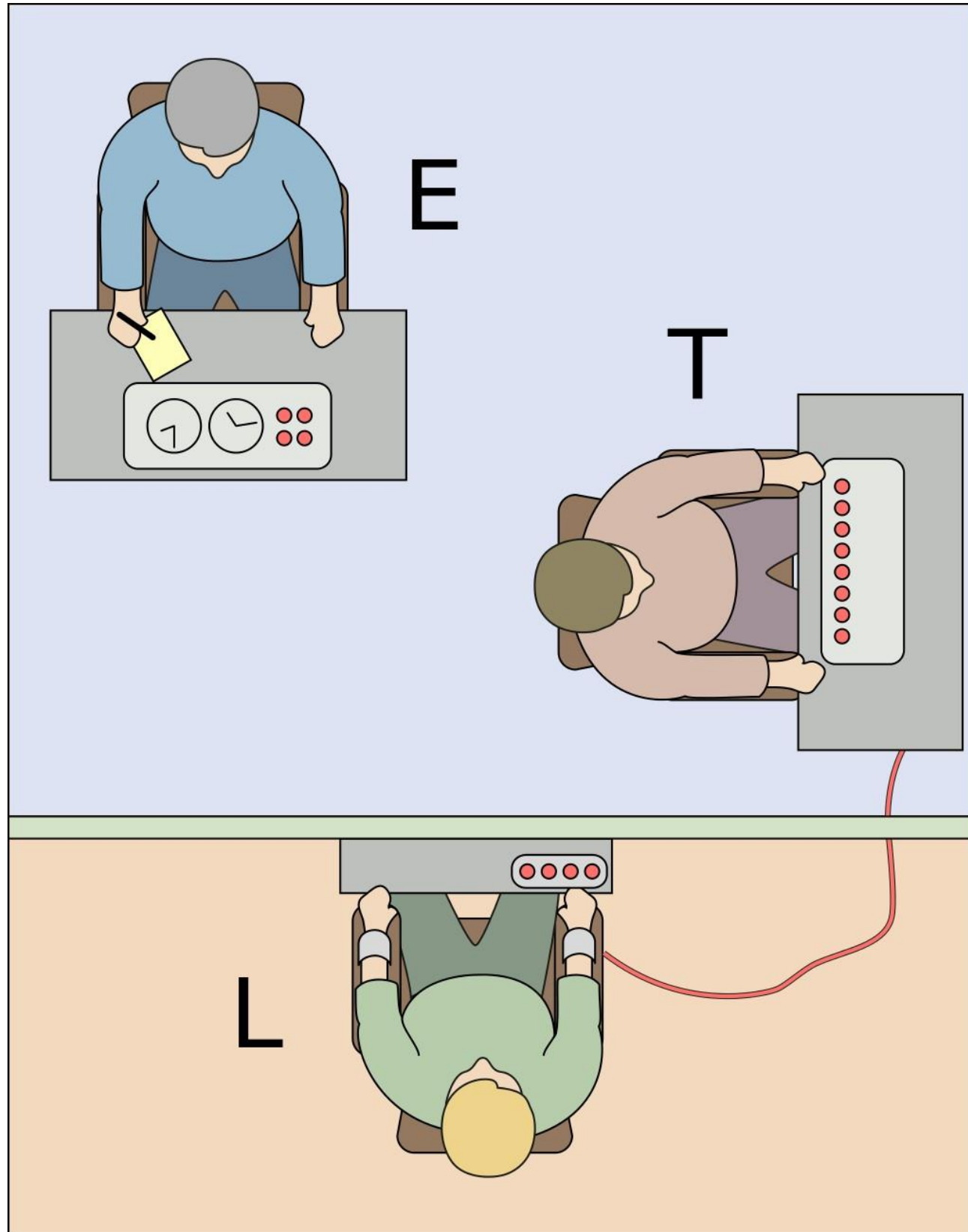
- A number of participants showed signs of distress, e.g., trembling, sweating, vomiting, uncontrollable seizures.

- Many pleaded to stop, but the experimenter asked them to keep going.

- The purpose of the study is not revealed to the participants.

Do you find any ethical issues in this experiment?

Ref: University of Minnesota Center for Bioethics. "A Guide to Research Ethics." (2003).

ETHICAL CONCERNS

▸ Needs to be considered since you plan your research.

  ▸ Must adhere to institutional, local, or national ethical review committee

  ▸ SDU's Research Ethics Committee

▸ Needs to be embedded into your research design and data collection strategy.

▸ Needs to be embedded into how you present your results.

PRINCIPLES OF RESEARCH INTEGRITY

- ▸ Honesty

- ▸ Transparency

- ▸ Accountability

PRINCIPLES OF RESEARCH INTEGRITY

▸ **Honesty** - ensures trustworthiness of research, requires accurate reporting when:

  ▸ Presenting, interpreting research results.

  ▸ Making claims based on findings

  ▸ Reviewing research

  ▸ Acknowledging the work of others, i.e., (authorship)

▸ Transparency

▸ Accountability

PRINCIPLES OF RESEARCH INTEGRITY

▸ Honesty

▸ **Transparency** - ensure credibility of research, require openness regarding:

▸ Planning of research

▸ Applied research method

▸ Results and conclusion

▸ Conflict of interest

Example: An academic holds a position (for example as a consultant, director or advisor) in an enterprise that may also have an interest in influencing government or other policy

▸ Accountability

Example

PRINCIPLES OF RESEARCH INTEGRITY

- Honesty

- Transparency

- **Accountability -** to ensure all parties involved in the research should be   accountable, researchers need to accept responsibility, regarding:

    - Accuracy and reliability of the results

    - Adherence to regulation:

        - SDU's Review Ethics Committee

        - Danish Research Code of Conduct and Integrity

    - Taking appropriate action in case of breach.

Types of Scientific Frauds

BURDEN OF MISCONDUCT

The burden of misconduct

The majority of retractions have involved scientific fraud (fabrication, falsification, and plagiarism) or other kinds of misconduct (such as fake peer review).

2000   **2005**   **2010**   **2015** *

Legend:
- Fraud
- Other misconduct
- Possible misconduct
- Reliability
- Error
- Miscellaneous

Retracted papers, by publication year

1997
All retractions: **62**
Fraud: **29**

2007
All retractions: **419**
Fraud: **252**

2014
All retractions: **946**
Fraud: **411**
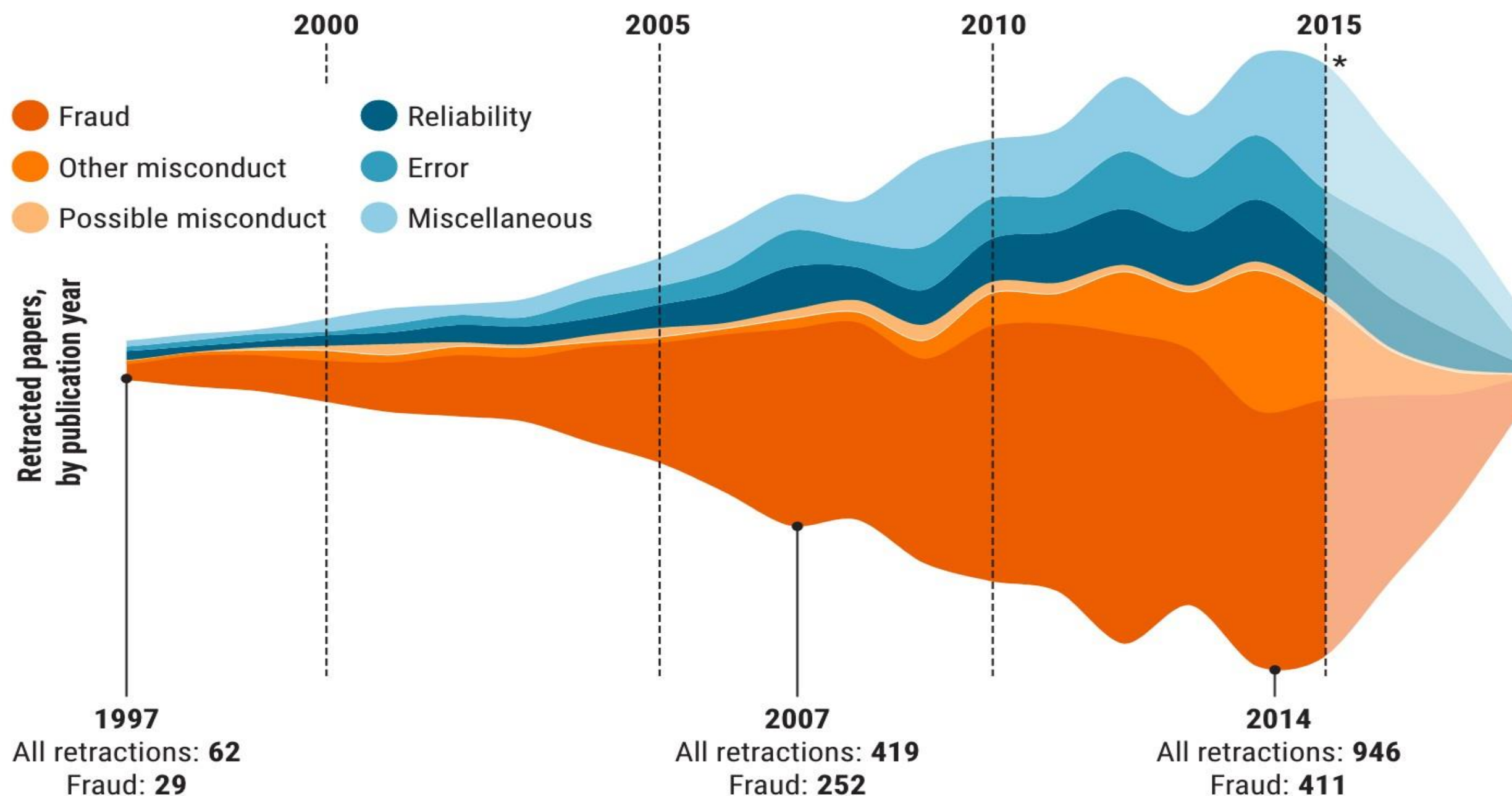
Retraction

What should you do if a paper you've cited is later retracted? (<mark>Self Study</mark>)

- Retraction Watch, the **influential website and database that tracks retractions in scholarly literature**

- They posed this question to several members of their parent non-profit organization's board of directors. These experienced individuals, with a wealth of experience at journals and organizations like the Committee on Publication Ethics (COPE), provided valuable guidance and insights in response.

SCIENTIFIC FRAUD

- Fabrication

- Falsification

- Plagiarism

SCIENTIFIC FRAUD

Fabrication

- Fabrication is the construction and/or addition of data, observations, or characterizations that never occurred in the gathering of data or running of experiments.

- Fabrication can occur when "filling out" the rest of experiment runs, for example. Claims about results need to be made on complete data sets (as is normally assumed), where claims made based on incomplete or assumed results is a form of fabrication.

SCIENTIFIC FRAUD

Falsification

- Falsification is the changing or omission of research results (data) to support claims, hypotheses, other data, etc.

- Falsification can include the manipulation of research instrumentation, materials, or processes.

Example Scenario:

Imagine a software engineer conducting research on the performance of two programming languages, Language A and Language B, with respect to memory usage. The researcher develops a custom benchmarking tool to measure memory consumption in various scenarios.

Manipulating the Instrumentation: The researcher intentionally modifies the benchmarking tool to favor Language A. They may introduce a bug that artificially inflates the memory usage measurements for Language B while reducing those for Language A.

SCIENTIFIC FRAUD

Plagiarism

- Using or representing the work of others as your own work constitutes plagiarism, even if committed unintentionally.

- When reviewing privileged information, such as when reviewing grants or journal article manuscripts for peer review, researchers must recognize that what they are reading cannot be used for their own purposes because it cannot be cited until the work is published or publicly available.

Forgetting to cite is still plagiarism.

Example: Is this plagiarism?

In order to communicate effectively with other people, one must have a reasonably accurate idea of what they do and do not know that is pertinent to the communication. Treating people as though they have knowledge that they do not have can result in miscommunication and perhaps embarrassment.

Nickerson, R. S. (1999). How we know - and sometimes misjudge - what others know: Imputing one's own knowledge to others. *Psychological Bulletin, 125*(6), 737-759.

Student's own work

Effective communication depends on a generally accurate knowledge of what the audience knows. If a speaker assumes too much knowledge about the subject, the audience will either misunderstand or be bewildered.

Example: Is this plagiarism?

Original source

In order to comm
reasonably accu[...] to
the communicati[...]ney
do not have can[...]

Nickerson, R. S. (1[...]
Imputing one's ow[...]

Student's ow[...]

Effective comm[...]dge
of what the au[...]
knowledge abo[...]nd
or be bewildered.

Yes, this is plagiarism.

Although the student paraphrased from the original source, **a citation must be provided** in text and a reference at the end of their assignment.

e.g. …or be bewildered (Nickerson, 1999).

Break (15 min)

SELF PLAGIARISM

Common forms of self-plagiarism by academics include:

- Using a dataset from a previous study (published or not) without making the reader aware of this.

- Submitting a manuscript for publication containing data, conclusions or passages that have already been published (without citing your previous publication).

- Publishing multiple similar papers about the same study in different journals.

Example: Is this plagiarism?
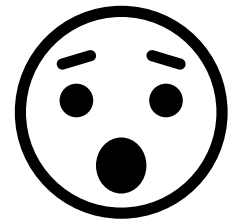
Article 1

Sometimes we have to write long papers, but most of the time, it is unnecessary: the papers often contain long introductions more suitable for doctoral dissertations or review "state of the art" papers apparently designed to provide evidence that the author is well-read.

Krashen, S. (2012). A short paper proposing that we need to write shorter papers. *Language and Language Teaching*, *1*(2), 38-39.

Article 2

Sometimes we have to write long papers to treat a topic adequately, but much of the time, it's unnecessary: Papers often contain long introductions more suitable for doctoral dissertations, apparently intended to provide evidence that the author is well-read…

Krashen, S. (2013). Reading and vocabulary acquisition: Supporting Evidence and some objections. *Iranian Journal of Language Teaching Research*, *1*(1), 27-43.

Example: Is this plagiarism?

Article

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Article

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Yes, this is self-plagiarism.

Even your own previously submitted work must be cited and referenced appropriately. You could either quote, paraphrase or summarise, providing a citation to the original source.

Plagiarism in Graphs, Charts, Figures, or Images

- Using graphs, charts, figures, or images from a source without acknowledging that another person developed them is considered plagiarism.

- If you have a figure or a table from an external sources (scientific papers, wikipedia, or other online sources), you need to provide a proper citation (as you do with text). You add the reference in the caption.

- Also, you should not copy and paste the table. You should recreate the table.

https://www.niu.edu/academic-integrity/faculty/committing/examples/plagiarism-in-graphs.shtml

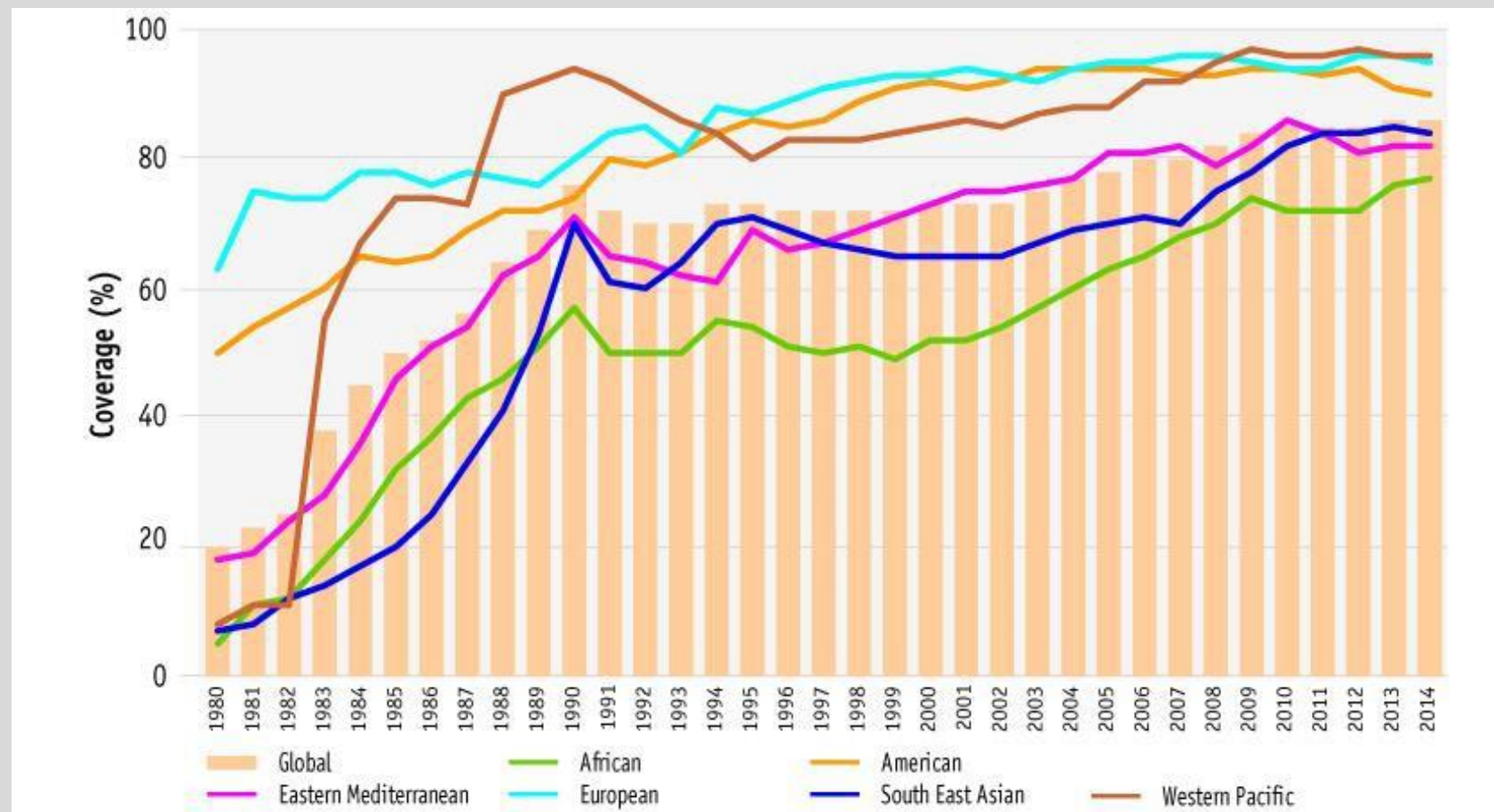# Example: Is this plagiarism? 😮

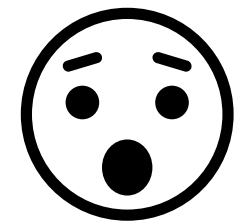**Figure 5**. DTP3 % immunisation coverage (WHO, 2015).

Reference list

WHO. (2015). *Immunization*. Retrieved from:

www.who.int/gho/immunization/en/

Example: Is this plagiarism?
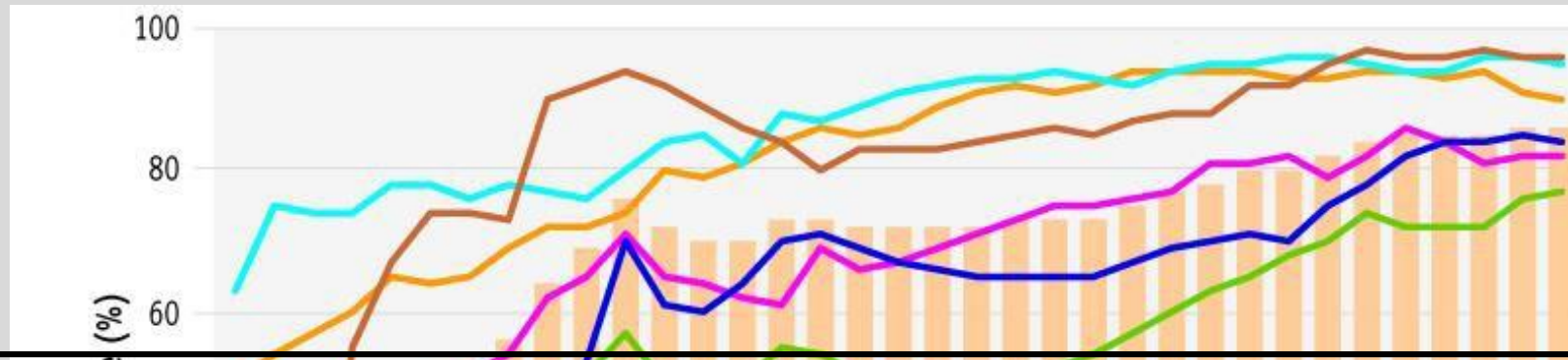
No, not plagiarism.

As long as you provide a citation and a reference, you can reuse tables, diagrams and images.

Refere

WHO. (2015). *Immunization*. Retrieved from:

www.who.int/gho/immunization/en/

OTHER KINDS OF MISCONDUCT
FAKE PEER REVIEW

- Peer-review process is compromised

Example: The paper is accepted based on recommendations

from fake reviewers

SOME EXAMPLES OF SCIENTIFIC FRAUDS

SCIENTIFIC FRAUD

thebmj   Research ⌄   Education ⌄   News & Views ⌄   Campaigns ⌄ | Archive

Feature » Secrets of the MMR scare

How the case against the MMR vaccine was fixed

Article | Related content | Metrics | Responses

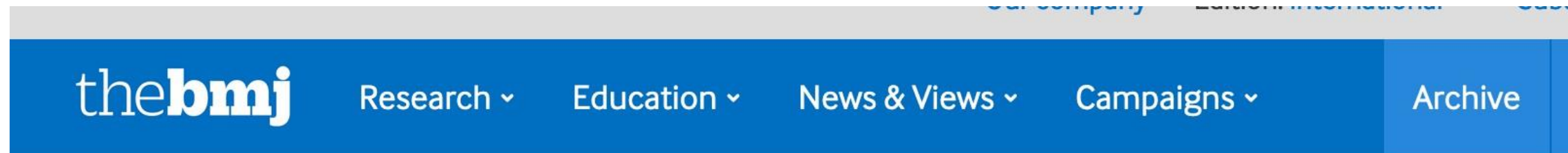*Brian Deer, journalist*

Author affiliations ⌄

briandeer.com

In the first part of a special *BMJ* series, **Brian Deer** exposes the bogus data behind claims that launched a worldwide scare over the measles, mumps, and rubella vaccine, and reveals how the appearance of a link with autism was manufactured at a London medical school

SCIENTIFIC FRAUD

thebmj   Research ⌄   Education ⌄   News & Views ⌄   Campaigns ⌄   Archive

Feature » Secrets of the MMR scare

How the case against the MMR vaccine was fixed

BMJ 2011 ; 342 doi: https://doi.org/10.1136/bmj.c5347 (Published 06 January 2011)
Cite this as: *BMJ* 2011;342:c5347

Article | Related content | Metrics | Responses

Brian Deer, journalist

Author affiliations ⌄

briandeer.com

IN 1998, THE STUDY WAS PUBLISHED. RETRACTED IN 2010

In the first part of a special *BMJ* series, **Brian Deer** exposes the bogus data behind claims that launched a worldwide scare over the measles, mumps, and rubella vaccine, and reveals how the appearance of a link with autism was manufactured at a London medical school

STILL HAS IMPACT EVEN TODAY!
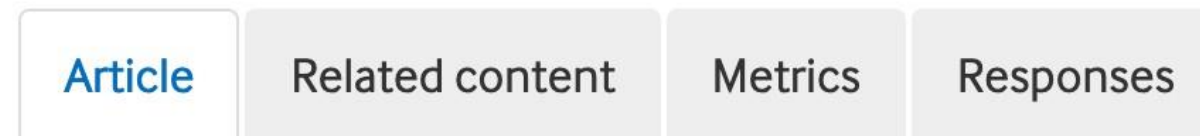
https://www.bbc.com/news/health-47417966

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Health

Vaccination deniers gaining traction, NHS boss warns

🕐 1 March 2019

GETTY IMAGES

PLAGIARISM

This article is more than **6 years old**

German education minister quits over PhD plagiarism

Annette Schavan's resignation over plagiarism ahead of election is second case to hit Merkel's government in two years

YOU WILL GET CAUGHT. DON'T DO IT!

▲ German chancellor Angela Merkel announces she has accepted the resignation of education minister Annette Schavan (left) in Berlin. Photograph: John Macdougall/AFP/Getty Images

YOUR RESPONSIBILITY AS RESEARCHERS

- You must not inflict harm.

- Do not cause physical, psychological pain.

- Maintain privacy.

  - Be cautious with where you store your data.

- You must not deceive.

- Honest to your participants.

- Honest to your audience.

- Make sure you don't break any law.

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THIS APPLIES EVEN IF YOUR STUDY DOES NOT INCLUDE HUMAN SUBJECTS

EXAMPLE OF TRANSPARENCY

DECLARATIONS

Availability of data and materials Not applicable

Competing interests The authors declare that they have no competing interests.

Funding (for both the study and the publication fees) Not applicable

Authors' contributions Conceptualization: Aisha Umair, Anders Clausen, Yves Demazeau, Bo Nørregaard Jørgensen; proposed approach: Aisha Umair, Anders Clausen; implementation: Aisha Umair, Anders Clausen; acquisition of results: Aisha Umair, Anders Clausen; initial draft preparation: Aisha Umair; critical revision: Anders Clausen, Yves Demazeau, Bo Nørregaard Jørgensen; supervision: Anders Clausen, Yves Demazeau, Bo Nørregaard Jørgensen; camera ready paper preparation: Aisha Umair. All authors have read and agreed to the final version of manuscript.

Umair, Aisha ; Clausen, Anders ; Demazeau, Yves ; Jørgensen, Bo Nørregaard. / **Agent Based Coordination Protocol for System of Cyber-Physical Systems**. In: Energy Informatics. 2021.

In Class Exercise: No Submission Required

EXAMPLE CASE STUDY: Authorship

Jamal is a graduate student working under the supervision of professor, Dr. Kerry. Dr. Kerry is conducting research on software security and has collected data from various software systems. Jamal uses Dr. Kerry's data to investigate a research question he formulated independently, focusing on software vulnerability analysis rather than general software security. His question is his own idea, but is still based on his understanding of software security gained through Dr. Kerry. Jamal's friend, Darcie, helped Jamal design a specialized software tool for vulnerability detection, but did not contribute in any other way to the research. When writing up his results, Dr. Kerry helped Jamal write the methods section of his manuscript and reviewed his final results and conclusions, as well as the final draft of the entire manuscript.

How should authorship be decided in this case?

EXAMPLE: Data Privacy and Informed Consent

Students are conducting a study on user behavior in a mobile app. They want to collect user data, including personal information and usage patterns, without explicitly informing the users.

- **Ethical Concerns?**
- **How will you address them?**

Which of the following is an example of plagiarism?

a. quoting a sentence verbatim and citing the author with page number

b. copying and changing a few words in a paragraph without citing the author

c. borrowing an idea from another author and citing them

d. paraphrasing your own previous work with a citation of yourself

EXAMPLE CASE STUDY: Plagiarism

Belinda is publishing her first article that builds on the research of a similar project she did three years prior with her colleague, Isaiah. In Belinda's current article she has placed a graph from the article she and Isaiah co-authored about their previous research. Isaiah created the original graph.

Does Belinda have to cite the previous article?

EXAMPLE: Fair Treatment of Participants

Students are conducting a user study to evaluate a new software application. They intentionally select participants who are likely to give positive feedback to validate their hypothesis.

- **Ethical Concerns?**

- **How will you address them?**

EXAMPLE CASE STUDY: Conflict of Interest

Dr. Garrath is a gynecological physician and an investigator on a research project for a pharmaceutical company testing a new topical treatment for a "xyz" disease that must be administered frequently and can cause itching and irritation. The company is paying her a rate of $2,000 per person enrolled.

Does she have a conflict of interest?

EXAMPLE CASE STUDY: Research misconduct

Marcus and Clay are game developers collaborating on a research project focused on user feedback for a new mobile game they've created. Clay is responsible for conducting user interviews to gather valuable insights on gameplay and user experiences. One day, Marcus learns that while Clay is interviewing research participants, if he does not elicit an answer, he invents one and passes it off as truthful data collection. Marcus questions Clay and he denies the allegation.

What should Marcus do?