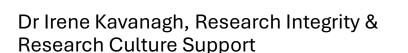


## Research Integrity for Research Staff

### UCC Research, Office of the Vice President for Research and Innovation



Irene.Kavanagh@ucc.ie

Research Integrity | Research and Innovation | University College Cork (ucc.ie)









UCC HR Research: Online sessions for Research Staff

#### **Topics**

- Research Integrity overview
- Research Misconduct overview
- High Profile Cases
- Concerns of the Research Community
- The 'grey-zone' scenarios
- Research Integrity your roles & responsibilities
- Training & Further Information





### What do we mean by Research Integrity? Your thoughts...





https://www.mentimeter.com/

Type in code displayed





# Research Integrity - overview



### Research is the quest for knowledge obtained through systematic study, thinking, observation, and experimentation

Different disciplines may use different approaches, but share the motivation to increase our understanding of ourselves and the world in which we live

#### The research community

individual researchers
research teams
research support staff
research performing organisations
research funders
academies & learned societies,
editors and publishers,
other relevant bodies
wider society



**Research integrity is an integral part of the research ecosystem:** [it] is crucial to preserving the trustworthiness of the research system and its results.

### Research Integrity is an integral part of research and research excellence



Research Integrity is also termed Responsible Conduct of Research (RCR)

Applies to all disciplines and to researchers at all career stages, research leaders, senior academic staff, and all research support staff (technical, administrative) and research/project managers/coordinators.

Research Integrity relates to the performance of research to the highest standards of professionalism and rigour, and to the accuracy and integrity of the research record in publications and elsewhere.

National Policy Statement on Ensuring Research Integrity in Ireland (2019)

Research Integrity is an integral

part of excellence and proper

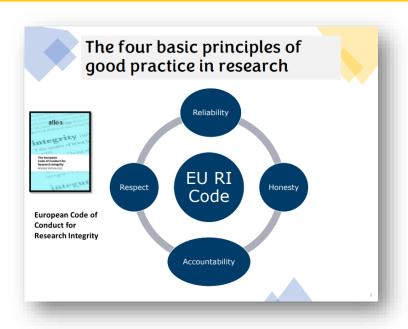
standards in the research

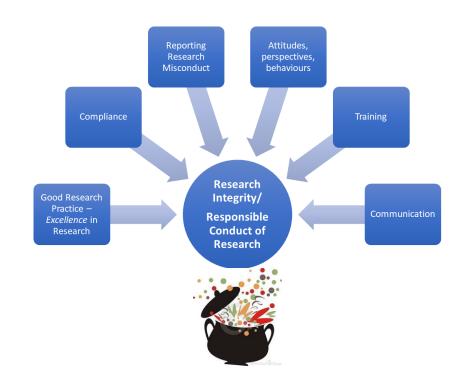
process and outputs

The principles of Research Integrity are not separate to your research

#### Ingredients of Research Integrity







### Your role & responsibility as a researcher and a member of the wider Research Community, is to...

- Ensure your research is conducted responsibly, ethically and with integrity
- Ensure Good Research Practice
- Comply with policy, frameworks and guidance
- Ensure you undertake the necessary and appropriate training in Research Integrity and skills to ensure Good Research Practice

#### Research Integrity & Good Research Practice



Applying the principles and processes of Research Integrity/Responsible Conduct of Research is synonymous with Good Research Practice and excellence and trustworthiness of your research



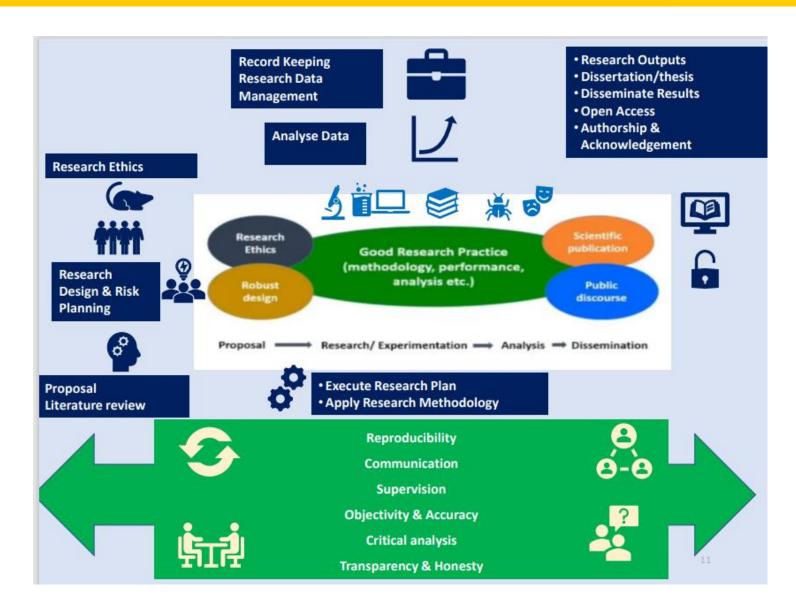


CODE OF RESEARCH CONDUCT

UNIVERSITY COLLEGE CORK ["UCC" or "the University"]

UCC Code of Research Conduct v2.4 Sept 2021





### Research Misconduct overview



#### RESEARCH MISCONDUCT

Unacceptable Research Practices relate to where an individual deliberately, dangerously or negligently deviates from accepted Responsible Conduct of Research practices that are expected to be followed

European Code for Research Integrity (2017); Resnik et al. (2015); Science Europe (2015)





The three major breaches of Responsible Conduct of Research are **FFP**:

Fabrication of data i.e. making up results and recording them as if they were real

Falsification of data i.e. manipulating research materials, equipment or processes, including changing, omitting or suppressing data or results without justification

**Plagiarism** i.e. using other people's work and ideas without giving proper credit to the original source, thus violating the rights of the original author(s) to their intellectual outputs

But there are others...



#### CONFLICTS OF INTEREST

• Conflicts of interest represent circumstances in which professional judgments or actions regarding a primary interest, such as the responsibilities of a researcher, may be at risk of being unduly influenced by a secondary interest, such as financial gain or career advancement

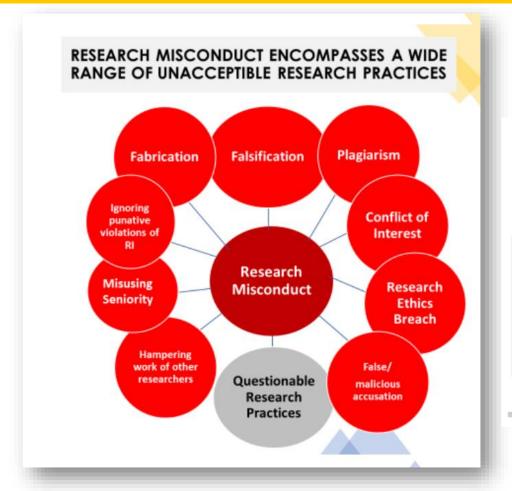
mbassy of Good Science (https://embassy.science/wiki/Theme:2f1668e3-c46b-44b0-bf6a-fc4698b671ca): Emanuel & Thombson (2008)

#### ETHICAL MISCONDUCT

- Failures to follow accepted procedures or to exercise due care in carrying out responsibilities for avoiding unreasonable risk or harm to humans; animals used in research; and the environment
- Failures to follow procedures relating to the proper handling of privileged or private information on individuals collected during the research

UK Research Integrity Office (UKRIO), 2016.





# Questionable Research Practices (QRP) "50 Shades of Grey" RCR QRP FFP

- QRPs are actions that concern trespassing methodological principles that threaten the relevance, validity, trustworthiness, or efficiency of the study at issue
- QRPs sit on the continuum between what is truly correct and truly deceptive.

From: McCarthy J, UCC PhD Pilot Seminar Series 2017

69





### High Profile Cases

#### · Warner

#### Coping with Chaos: How Disordered Contexts Promote Stereotyping and Discrimination





"I failed as a scientist. I adapted research data and fabricated research. Not once, but several times, not for a short period, but over a longer period of time. I realize that I shocked and angered my colleagues, because of my behavior. I put my field, social psychology in a bad light. I am ashamed of it and I deeply regret it"

University College Cork, Ireland

https://www.youtube.com/watch?v=c-bemNZ-lqA (to 2.46min)

14



French professor faces disciplinary case over hydroxychloroquine claims

Didier Raoult stands accused of touting drug as a coronavirus treatment without evidence



At the beginning of the pandemic Raoult claimed that hydroxychloroquine, a derivative of the antimalarial drug chloroquine, could cure covid-19

Elizabeth Bik raised concern wrt methodolology, the way the data was handled, the peer review process and ethical issues...

Methodology: researchers had failed to control for confounding factors. For instance treatment and placebo groups in Raoult's study differed in important ways that could have affected the results.

Missing data: Six patients enrolled in the treatment group at the beginning of the study were not accounted for by the end, missing from the data.

Peer review: the paper was submitted and accepted within 24 hours

# Unacceptable and questionable practices



Ethical Misconduct

#### Ethical issues:

2022, France's Agency for the Safety of Health Products (ANSM) is filing criminal charges against the institute led by Didier Raoult: "...serious breaches and (cases of) non-compliance with the rules on research involving humans, notably as regards ethics...[S]hortcomings involved patient consent and information, as well as the collection and use of patient samples"

Scientists rally around misconduct consultant facing legal threat after challenging COVID-19 drug researcher

Lawyer for microbiologist Didier Raoult has accused Elisabeth Bik, who analyzes scientific papers for image manipulation, of harassment, blackmail



Unité de Recherche sur les Maladies Infectieuses et Tropicales Emergentes, (Infectious and Tropical Emergent Diseases Research Unit Raoult has published prolifically with over 3200 papers indexed on PubMed to date.

Retraction Watch database has shown that to date Didier Raoult has had 18 papers retracted with a further 218 papers with "an Expression of Concern" notice.

### Retraction Watch

Tracking retractions as a window into the scientific process





https://retractionwatch.com/



In a recent investigation into Raoult's research activities by the French newspaper *Médiapart*, a researcher who had been a member of the evaluation committee of Raoult's laboratory said: "What struck her was Didier Raoult's obsession with his publications. A few minutes before the evaluation of his unit began, the first thing he showed her on his computer was his hindex." Raoult had also said in *Le Point* magazine in 2015 that "it was necessary to count the number and impact of researchers' publications to assess the quality of their work."

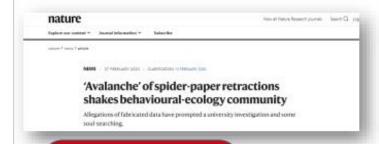
#### The h-index: Raoult vs. Einstein

**H-index-**number of articles *N* by an author that have each received at least *N* citations, the h-index is limited by the total number of published articles.

**Raoult:** has 2,053 articles published between 1979 and 2018, having received a total of 72,847 citations: **h-index calculated for this period is 120.** 

**Einstein**, has 147 articles listed in the Web of Science database between 1901 and 1955, the year of his death and received 1,564 citations during his lifetime: **h-index** of 56

Jonathan Pruitt, a behavioural ecologist and rising star in the field of spider behaviour. His research looked at how different personalities form within communities of social spider species that live in groups - emerging ideas on how animal behaviours evolve in the context of their environment.



Data irregularities
- fabricated and
falsified data

After >2 years of allegations, at least 13 of Pruitt's papers have been retracted, and 6 others have been labelled with expressions of concern. He resigned from McMaster in July 2022 after receiving confidential settlement terms



When colleague & co-author Laskowski dug into data sets that Pruitt had provided for the study, she was shocked to find stretches of data that seemed to have been duplicated, to represent findings for multiple spiders.





# Concerns of the Research Community



### The complexities of Responsible Conduct of Research & Good Research Practice!

- · Research is becoming more complex
- Increase in volume
- · Research Culture 'the system', e.g. competitiveness



- Increased requirements around compliance
- Bureaucracy
- · Information tsunami!

#### Why care about Research Integrity?



#### SCIENCE EUROPE







- Safeguards the foundations of Science and Scholarship
- 2. Maintains public confidence in researchers and research evidence
- Underpins continued public investment in research
- Protects the reputation and careers of researchers
- Prevents adverse impacts on patients and the public
- 6. Promotes economic advancement
- 7. Prevents avoidable waste of resources

#### **Consequences of Research Misconduct**

- Negatively Impacts Research Excellence
- Negative impact on patients & study participants
- · Negative impact on the wider population
- Collateral damage to colleagues and the field of study associated with the guilty researcher(s)
- Financial Cost

Hiney, M. (2015). Briefing Paper on Research Integrity. What it Means, Why it is important and Haw we Might Protect it. Available at <u>Briefing Paper on</u> Research Integrity: What it Means, Why it is Important and How we Might Protect it. 2015.

### Why care about Research Integrity? Research Misconduct is an ongoing and growing concern





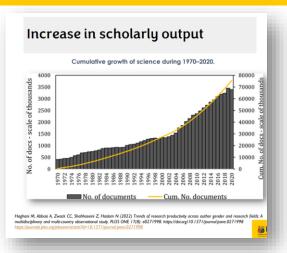
"An often-heard argument against implementing guidelines, frameworks or governance structures to ensure research integrity is that it is an over-reaction, since serious misconduct is so rare"

Hiney, M. (2015). Briefing Paper on Research Integrity. What it Means, Why it is important and How we Might Protect it. Available at: Briefing Paper on Research Integrity: What it Means, Why it Is Important and How we Might Protect it. 2015

- Research Misconduct is an international issue
- Research Misconduct arises in all disciplines: Humanities, Arts, Social Sciences, Business & Law as well as Biomedical, Physical and Engineering Sciences
- The incidence of Research Misconduct is tracked by official statistics, survey results, and analysis of retractions
- All of these indicators have shown that the incidence of Research Misconduct is increasing over time
- For example, studies suggest that as many as one in every 100 researchers engages in serious misconduct over the course of a three to five year period (US ORI)

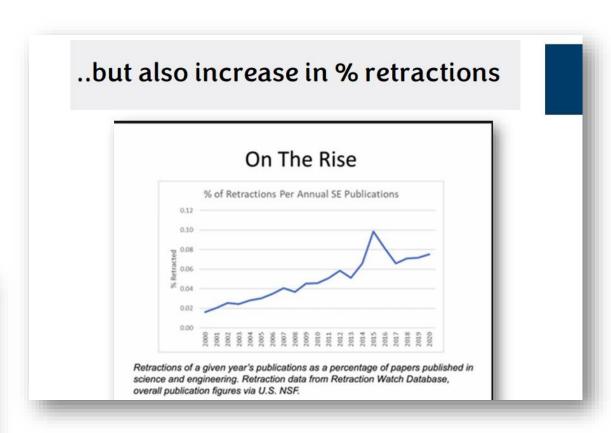
#### Retractions



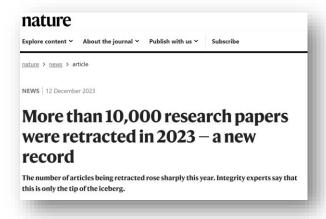




- · Duplication ("self-plagiarism")
- Plagiarism
- · Image Manipulation
- Faked Data
- Faked Data
   Fake Peer Reviews
- Publisher Error
- Authorship Issues
- · Legal Reasons
- Paper Mills



Oransky I (2023). Retractions are on the rise, but not enough. Retraction Watch Presentation at the UK Research Integrity Conference 2023, 'Research integrity - culture and confidence', 24th May 2023, online.



### Papers and peer reviews with evidence of ChatGPT writing



### Retraction Watch

Tracking retractions as a window into the scientific process

https://retractionwatch.com/202 3/10/06/signs-of-undeclaredchatgpt-use-in-papersmounting/

### Signs of undeclared ChatGPT use in papers mounting

#### **Analysis & surveys**



- Meta-analysis span: 1992 2020
- 42 articles
- 571 studies, spanning different disciplines
- 23,228 participants, consisting of researchers and PhD students from 18 countries.
- 2.9% of researchers had committed RM concerning at least 1 of FFP, 12.5% had committed QRPs concerning 1 or more QRPs.
- 15.5% of researchers witnessed certain behaviours of RM, of whom 39.7% had knowledge of various QRPs

Xie, Y., Wang, K. & Kong, Y. Prevalence of Research Misconduct and Questionable Research Practices: A Systematic Review and Meta-Analysis. Sci Eng Ethics 27, 41 (2021). https://doi.org/10.1007/s11948-021-00314-9

#### QRPs = "Sloppy science/research" - is it a problem?

# PLOS ONE \*\*RESEMBLANCIAL\*\* Prevalence of questionable research practices, research misconduct and their potential explanatory factors: A survey among academic researchers in The Netherlands \*\*GROUNDERGENIAL\*\*\* GROUNDERGENIAL\*\*\* GROUNDERGENIAL\*\*\* GROUNDERGENIAL\*\* GROUNDERGENIAL\* GROUNDER

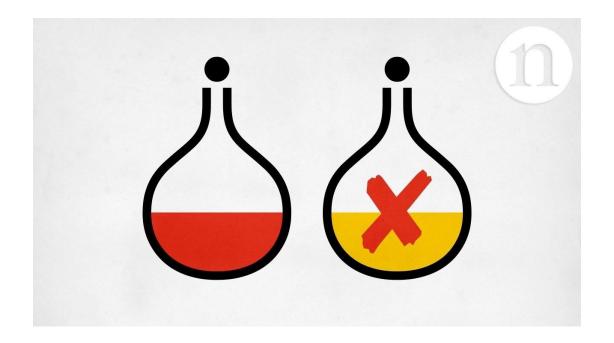
Collectively, lesser forms of research misconduct, or QRPs, may have more impact owing to their prevalence

- National Survey on Research Integrity 6,813 academic researchers in The Netherlands
  - > Prevalence of fabrication and falsification were 4.3% and 4.2%, respectively
  - > 51.3% of respondents engaged frequently in at least one QRPs

G. Gopalakrishna, G. ter Riet, M. Cruyff, G. Vink, I. Stoop, J.M. Wicherts, L.M. Bouter (2021) Prevalence of questionable research practices, research misconduct and their potential explanatory factors: a survey among academic researchers in The Netherlands. Preprint https://www.researchaate.net/publication/353051736

#### **Reproducibility Crisis**





Out of 1,576 scientists, most agree that there is a crisis and over 70% said they'd tried and failed to reproduce another group's experiments.

Baker, M. (2016). 1,500 scientists lift the lid on reproducibility. Nature533, 452-454 (2016). https://doi.org/10.1038/533452a

### Research Integrity-Safeguarding our Research



### Safeguarding our research

- As instances of research malpractice and misconduct are increasing worldwide.
- National Research Integrity Forum (NRIF)
  - It is essential that the Irish research system as a whole protects its reputation for the quality and integrity of its research activity and outputs.

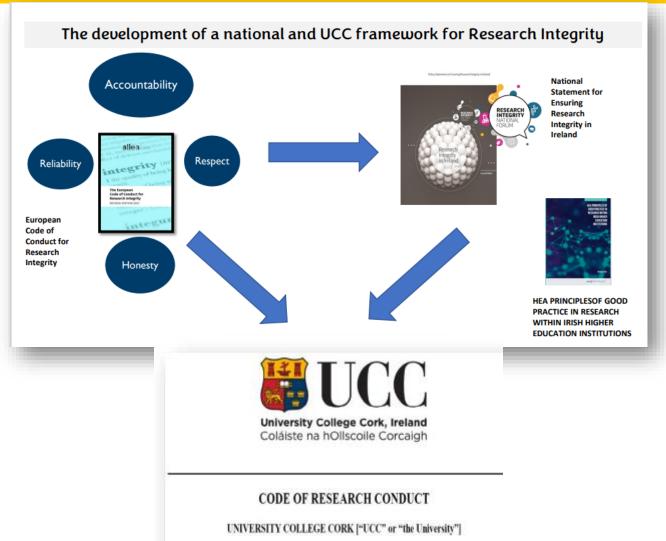
https://www.iua.ie/for-researchers/researchintegrity/



For the most-part it is the research community who flag concerns about unacceptable practices and research misconduct - it is critical to have frameworks and processes in place to protect them and scholarly criticism of dubious research practices and outputs.

#### **Research Integrity Frameworks & Policies**





### Research Integrityincreasingly at the forefront of the national and institutional Research Agendas



2.5 Research Culture: Embed consistent good research practices to drive research excellence and quality of outcomes...ensure that the HEA Principles of Good Practice, in line with the new HEA legislation, are implemented by all higher education institutions and other public research performers in key areas such as Research Integrity; National Action Plan for Open Research

Impact 2030: Ireland's Research and Innovation
Strategy

Pillar Two: IMPACT OF RESEARCH AND INNOVATION STRUCTURES ON EXCELLENCE AND OUTCOMES

The Strategy architecture and the institutional landscape provide an environment where talent and excellence are rewarded and impact assured.

#### **UCC Strategy**



III. Transform UCC's research culture through the implementation of Engaged Research and Open Research, underpinned by integrity, ethical and responsible practice



#### **Research Funding Organisations requirements**

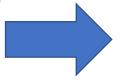


Research Funding Organisations (RFOs), such as National/EU Funders and the Wellcome Trust (UK) expect and require researchers and Research Performing Organisations (RPOs) to uphold Research Integrity principles and practices

- >Applications & post award
- **≻**Reports
- ➤ RI training
- Require RPOs to have proper processes and procedures for handling allegations of Research Misconduct

The **Epigeum online Research Integrity Training** is mandated by Irish funding bodies:

- SFI-IRC (Research Ireland)
- HRB
- EPA



Certification in Epigeum RI is recognised & required by these funding bodies

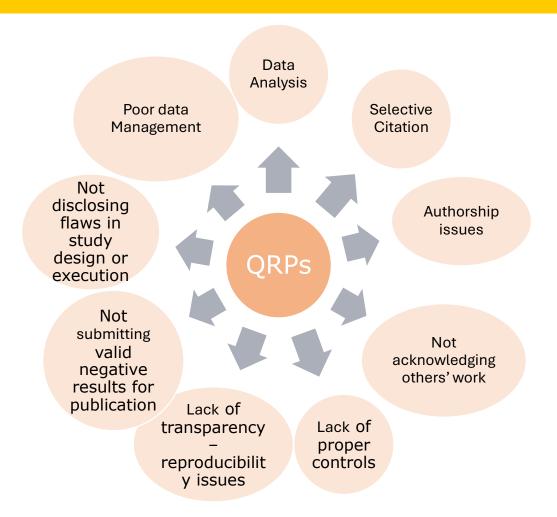




# The 'grey-zone' – scenarios!

#### **Questionable Research Practices (QRPs)**





#### QRPS – misconduct or not?

Whether a QRP qualifies as research misconduct is often determined by the seriousness of the incident and the culpability and intent of the researcher



### Poor research practices can be deliberate or unintentional

- For instance plagiarism can be due to a serious breach of responsible research conduct ('blatant plagiarism')
- or it can be a result of Questionable Research Practices

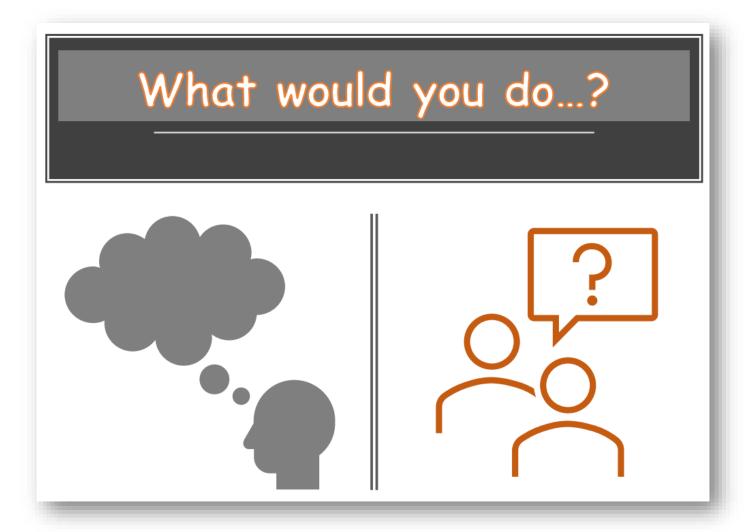
  (QRPS) due to 'cutting corners' (intentional) or

  unintentional carelessness/lack of knowledge

#### **Example:**

How can you avoid unintentional plagiarism?

Tips to avoid Accidental Plagiarism (youtube.com)



### Scenario 1 – image manipulation





ori.hhs.gov | @hhs\_ori | askORI@hhs.gov







#### **Scenario 1-Discussion Questions**

Go to www.menti.com and use the code

Mentimeter

- Why do you think the postdoc chose to falsify his data?
- What would you do in his place?

#### **A Word About Images**



#### Spot the difference





H. Kasban, Sabry Nassar,. An efficient approach for forgery detection in digital images using Hilbert–Huang transform, Applied Soft Computing, Volume 97, Part A, 2020, 106728, https://doi.org/10.1016/j.asoc.2020.106728.

- An image used for research/research output is DATA
- Undocumented alterations to research images, ie image manipulation, may represent a case of research misconduct.
- S. R. Jordan. Research integrity, image manipulation, and anonymizing photographs in visual social science research. International journal of social research methodology, 07/2014, Volume 17, Issue 4

#### **Images - General Guidance**



- Digital manipulation of images increasingly problematic
- · Images are data
- Difficult to develop universal set of rules discipline specific

#### **Tips**

- Follow subject-specific best practice and journal guidelines in which you intend to publish
- Avoid complex or inconsistent manipulations:
  - > cutting and pasting (copying one part of an image into a different image or a different part of the same image)
  - > cloning (replacing one part of an image with material from another part of the same image)
  - burning (darkening specific parts of an image);
  - improper cropping; colour/contrast/brightness manipulation;
  - ➤ inconsistent image use
- · Explain how you processed/manipulated the image you are presenting
- Keep and time stamp the original image; you could be asked to provide this information if the validity of your published image is ever questioned



#### Scenario 2 - Data Analysis

Go to <u>www.menti.com</u> and use the code

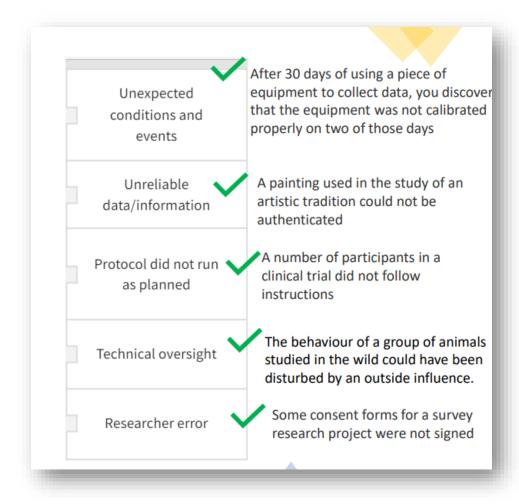
Mentimeter

Should any information be excluded from interpretation?



#### Scenario 2 - Data Analysis

## Should any information be excluded from interpretation?



#### **Data Analysis - Guidance**



There may be acceptable good reasons for excluding information

- •Ensure that the reasons behind your selections (and especially your omissions) are explained when you report your findings.
- Know the best practices for your field
- •Discuss your data selection plans with colleagues, peers and mentors to gain their advice and expertise
- •Are completely clear about what you have done, and the decisions you have made, when you present or discuss your data
- Are aware of and take steps to avoid confirmation bias

**Check out: Bias in Research** 

#### Data Analysis -excluding data





#### What is unacceptable?

Pick and choose evidence
Selective use of time periods

Delete unwanted data Fabricate data Ignore conflicting evidence

Improper controls

Ignore protocol requirements

Terminate study prematurely

#### **Data Analysis & QRPs**



Opposite of Cherry
Picking: omitting
data/results which are
not favourable to your
hypothesis and/or impact
negatively on the
statistical significance of
your findings

OVESTIONABLE RESEARCH DRACTICES

SELECTIVE
OMISSION

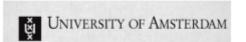
RESEARCH
OINTEGRITY
OPHACKING

P-HACKING

Hypothesising after results are known

Selecting data which makes the significance (P value) more statistically favourable

Related to P-hacking: selecting only results which are significant or favourable to your hypothesis



Questionable research practices | Quantitative methods | Practice, Ethics and Integrity | UvA (youtube.com)

#### Scenario 3: authorship



<u>ori.hhs.gov/images/ddblock/SCRIPT-08-hi-</u>res.mp4



#### Go to <u>www.menti.com</u> and use the code

Join at menti.com | use code 4847 0674

Mentimeter

#### **Scenario 3-Discussion Questions**

What could the PI have done to help prevent this situation from occurring?

What considerations should be taken into account when determining authorship?

#### **Authorship & Acknowledgement**



#### **Authorship**

- · Assuming accountability for all aspects of the work, ensuring that questions related to the
- accuracy or integrity of any part of the work are appropriately investigated and resolved.
- Giving final approval of the version to be published.
- Drafting the work or revising it critically to incorporate important intellectual content.
- Making a substantial contribution to the conception or design of the work (or the acquisition, analysis or interpretation of data for the work).

#### Acknowledgement

- · Acting as a mentor or supervisor.
- Conducting routine work (e.g. scheduling interviews or collecting routine data)
- Providing the funding for work done by others.
- Providing special equipment, materials, reagents or skills.

Resources: COPE (Committee on Publication Ethics)
https://publicationethics.org
CRediT (Contributor Roles
Taxonomy)

https://credit.niso.org/





Research Integrity - Roles &
Responsibilities



#### **Collective Responsibility**

"The primary responsibility for ensuring this lies with individu researchers and institutions. However, the entire research community, which also encompasses academic publishers, funders and regulators, has responsibilities to fulfil in order to maintain high standards of research integrity".

Epigeum Online Research Integrity Training (v2.0), Oxford University Press (2021)

#### **Fostering a Culture of Research with Integrity**



 Enhancing Research Integrity therefore means fostering and developing a cultural mind-set whereby all researchers should strive to improve the quality, relevance and reliability of their work.

https://www.iua.ie/for-researchers/research-integrity/



#### Research Integrity – your role & responsibility



- Comply with and uphold the Principles set out in the UCC Code of Research Conduct:
  - Conducting Research responsibly and with integrity
  - reporting misconduct
  - · Training requirements
- Be familiar with and uphold other UCC policies relating to Research
   Integrity: Research Ethics, Data Management, Conflict of Interest policy,
   Open Access etc
- Undertake training in Research Integrity
  - Epigeum online training in Research Integrity (Mandatory)
  - > UCC 'in house' training in Research Integrity



### BE AWARE & BE INFORMED UNDERTAKE FURTHER TRAINING!!

You should be aware that claiming 'you were not aware' is not an excuse for unacceptable and questionable practices that may be subject to further investigation





# Research Integrity@UCCTraining & Further Information



Research Integrity-where do I find out more and what training should I undertake to ensure responsible & best research practice?



https://www.ucc.ie/en/re search/culture/integrity/



#### **Research Integrity-TRAINING**





(1)



Epigeum Research
Integrity Training |
University College
Cork (ucc.ie)

(2) Research Skills Training
Programme 2024

(3) Digital Badge in the Responsible Conduct of Research

Research Integrity Training | Research and Innovation | University College Cork (ucc.ie)

#### **Research Integrity TRAINING**



October 2<sup>nd</sup>, 2024

Epigeum Research
Integrity Training |
University College
Cork (ucc.ie)



#### **Epigeum**

- Self-register via <a href="UCC webpage">UCC webpage</a>
- Free access
- Early Career: Pass Modules 1-8 (Core Modules)
- Mid-Advanced Career: Pass Modules 1&2
- Renew training every three years: Pass Modules 1&2
- Undertake in your own time self directed
- MANDATED by Irish Research Funding Organisations

#### **Research Integrity TRAINING**



(2)
Research Skills
Training
Programme 2024

Targeted at researchers across all disciplines and at all career levels.

Workshops cover a variety of topics relating to Research Skills, including **Good Research Practice** and **Responsible Conduct of Research** such as Research Integrity, Research Ethics, Research Data Management, Open Science, Publication Practice etc.

Attending 5 sessions of the Research Skills
Training Programme within the same calendar
year will entitle researchers to a certificate of
completion (CPD)

Research Integrity & Research Ethics 14/11/2024 \*recording available

Irene Kavanagh and Chairs of UCC Research Ethics Committees – Claire O Neill, Christian Waeber, David Kerins

#### **Research Integrity TRAINING**



(3) Digital Badge in the Responsible Conduct of Research



Open to members of UCC's Research Community across each of the four colleges, and all research career stages (postgraduate research students, postdoctoral researchers, research fellows, Pls/supervisors/mentors, research leaders & senior/academic staff and research support staff).

The topics covered centre on **Research Integrity**, the **FAIR Data Principles**, **Data Management** and **Reproducible Research**. Most funding bodies, both Irish and European, now require evidence of training on these topics

#### **Course Content & Requirements**

- •Self-directed learning through Canvas
- •In-person workshop (9.30am to 4.30pm)- tailored to the specific needs the group
- Submission of a reflective exercise
- •Completion of the online Epigeum Research Integrity course. For registration and further information see <a href="Epigeum Online Research Integrity Training">Epigeum Online Research Integrity Training</a>

## Thank you!

Dr Irene Kavanagh | Research Officer | UCC Research | Research Integrity Support |

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Research Integrity | Research and Innovation | University College Cork (ucc.ie)