What do you do if you think a competitor was cheating?
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Session Overview

Session Topics:

- Overview of research misconduct
- Definition of research misconduct
- Research misconduct versus questionable research practices
Research

- Research
  - Training
    - BS, MS, PhD/DPT/EdD, Post-doc
- Good research is hard work.
- This presentation is not geared to tell you how to conduct research.
  - There is no one way to conduct research.
- Geared towards talking about best practices.
Introduction

- Science is predicated on trust.

- Most researchers approach their work with the highest standards of ethics and integrity.

- A great deal of care goes into making sure that data are accurate, complete and that safeguards and protections are strictly followed.
Why Responsible Conduct of Research training?

- If scientists are ethical and principled individuals, why then the need for research misconduct training?
  - Understand the process

- Federal mandate
  - Based upon cases of misconduct associate with federal funding of research.
  - Public trust is at stake
  - Pursuit of scientific truth is damaged
  - Public interest (e.g., health and safety) is impacted
  - Waste of taxpayers’ money

- The reward system (e.g., promotion, tenure, merit) is built upon scholarship productivity.
Research Misconduct

What is the extent of the problem?

- “...2% of scientists have reported committing misconduct at least once.”
  - 2% = upwards of 8,000 researchers
- “…34% of scientists admitted to one or more questionable research practices…”
  - Inappropriate analysis
  - Over-interpretation of findings
  - Changing study design

Of 2046 retractions (dating back to 1977), 67% of the papers retracted were due to misconduct.

- Fang, Steen, & Casadervail (2012)
Recent cases

- **Bryan Doreian (2013)**
  - Claimed he had replicated experiment in 15 samples but actually did it in fewer.
    - Influenced statistical outcome
  - Falsifying data in PhD dissertation & Manuscript

- **Eric Poehlman (2005)**
  - The physiological changes associated with menopause, obesity, affects of exercise on obesity, and the human aging process
  - NIH funded
  - Created fictitious data sets
    - 17 grant applications, 10 papers

- **Eric Smart (2012)**
  - Falsifying images for NIH applications
  - Reporting data from mice that did not exist
  - “German Education Minister Resigns Amidst Plagiarism Scandal” 2013 headline
Research Misconduct

- It is a real problem.
- What happens when Research Misconduct is observed?

- 24% who observed misconduct have reported to IO
  - Researchers may not feel compelled to report
  - Researchers are worried about what happens if they do report

Outcomes of Interventions

... mostly good news

Definition of Research Misconduct

- Under the provisions of the federal research misconduct policy, research misconduct is defined as:
  - fabrication, falsification, or plagiarism in proposing, performing, or reviewing research, or in reporting research results.
Research Misconduct

- **Fabrication** is making up data or results and recording or reporting them.
  - “A supervisor accused a visiting post-doctoral research fellow of fabricating test scores on mice.”
  - “… in the case of four follow up examinations for four patients, there were no records that the examinations and procedures reported by the clinic coordinator had taken place.”
Falsification is manipulating research materials, equipment, or processes, or changing or omitting data or results such that the research is not accurately represented in the research record.

“Falsely stating in the associated text that there were ten mice per group and that the experiments were repeated once, while in fact, there were only five mice per group with no repetition of this experiment.”
Research Misconduct

- **Falsification**

Leon Trotsky vs. Joseph Stalin post Lenin
Research Misconduct

- **Plagiarism** is the appropriation of another person’s ideas, processes, results, or words without giving appropriate credit.
Avoid Plagiarism: Paraphrase

- When in doubt ... cite your source
- When paraphrasing ... cite your source
- Paraphrasing:
  - Putting another person’s ideas in your own words.
  - Focuses content on a specific point ... a more detailed restatement vs. a summary.
- Paraphrasing helps the writer better understand material.
  - Read the material several times, put it down, think about it, write about it (cite your source).
  - Continue writing ... go back and revise with a fresh perspective.
  - Compare your version with the source.
- Paraphrasing reduces the overuse of quotations.
- Use quotes to identify direct phrasing you have borrowed from a source.
- Cite your source.
Paraphrase Example

Original
- However, although humans are comparatively poor sprinters, they also engage in a different type of running, endurance running (ER), defined as running many kilometres over extended time periods using aerobic metabolism (Bramble & Lieberman, 2004).

Paraphrase
- Having limited success in sprinting compared to other mammals, humans perform better in endurance running, which is a form of aerobic running over extended distances and periods of time (Bramble and Lieberman 2004).

Plagiarism
- ___ Although humans are relatively poor sprinters, they do ____ engage in __________ endurance running defined as running many miles over extended periods of time.
Research Misconduct

UNLV further defines research misconduct as:

- **Material failure to comply** with applicable federal requirements for protection of researchers, human participants, or the public; or for ensuring the welfare of laboratory animals

- **Material failure to disclose all Conflicts of Interest**

- **An abuse of confidentiality**
Research Misconduct

- **Material failure to disclose Conflict of Interest**
  - Conflict of Interest
    - Any outside activity or interest that may adversely affect, compromise, or be incompatible with the obligations of an employee in the institution.
    - e.g., use of position to for personal financial gain
Research Misconduct

- An abuse of confidentiality, such as the use (or release to others) of ideas or preliminary data of others, which were given in the expectation of confidentiality, such as those gained from access to privileged information through:
  - (1) the opportunity for editorial review of manuscripts;
  - (2) and the opportunity for peer review of proposals by external entities or by internal committees; and
  - (3) disclosure pursuant to a confidentiality agreement between UNLV and a third party.
What Research Misconduct is Not

- Honest errors
- Differences of opinion
- Authorship disputes such as those involving rank order (absent of plagiarism)
Research Misconduct vs. Questionable Research Practices

- Steneck (2003) defines questionable research practices as: departing from acceptable research practice of the relevant research community. Examples include:
  - sloppy or careless research
  - statistical errors
  - inappropriate allocation of authorship
  - inaccurate references

- Questionable research practices are believed to be more common than research misconduct.
Table 1 | Percentage of scientists who say that they engaged in the behaviour listed within the previous three years (n = 3,247)

<table>
<thead>
<tr>
<th>Top ten behaviours</th>
<th>All</th>
<th>Mid-career</th>
<th>Early-career</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Falsifying or ‘cooking’ research data</td>
<td>0.3</td>
<td>0.2</td>
<td>0.5</td>
</tr>
<tr>
<td>2. Ignoring major aspects of human-subject requirements</td>
<td>0.3</td>
<td>0.3</td>
<td>0.4</td>
</tr>
<tr>
<td>3. Not properly disclosing involvement in firms whose products are based on one’s own research</td>
<td>0.3</td>
<td>0.4</td>
<td>0.3</td>
</tr>
<tr>
<td>4. Relationships with students, research subjects or clients that may be interpreted as questionable</td>
<td>1.4</td>
<td>1.3</td>
<td>1.4</td>
</tr>
<tr>
<td>5. Using another's ideas without obtaining permission or giving due credit</td>
<td>1.4</td>
<td>1.7</td>
<td>1.0</td>
</tr>
<tr>
<td>6. Unauthorized use of confidential information in connection with one’s own research</td>
<td>1.7</td>
<td>2.4</td>
<td>0.8 ***</td>
</tr>
<tr>
<td>7. Failing to present data that contradict one's own previous research</td>
<td>6.0</td>
<td>6.5</td>
<td>5.3</td>
</tr>
<tr>
<td>8. Circumventing certain minor aspects of human-subject requirements</td>
<td>7.6</td>
<td>9.0</td>
<td>6.0 **</td>
</tr>
<tr>
<td>9. Overlooking others' use of flawed data or questionable interpretation of data</td>
<td>12.5</td>
<td>12.2</td>
<td>12.8</td>
</tr>
<tr>
<td>10. Changing the design, methodology or results of a study in response to pressure from a funding source</td>
<td>15.5</td>
<td>20.6</td>
<td>9.5 ***</td>
</tr>
</tbody>
</table>

Other behaviours

<table>
<thead>
<tr>
<th>Other behaviours</th>
<th>All</th>
<th>Mid-career</th>
<th>Early-career</th>
</tr>
</thead>
<tbody>
<tr>
<td>11. Publishing the same data or results in two or more publications</td>
<td>4.7</td>
<td>5.9</td>
<td>3.4 **</td>
</tr>
<tr>
<td>12. Inappropriately assigning authorship credit</td>
<td>10.0</td>
<td>12.3</td>
<td>7.4 ***</td>
</tr>
<tr>
<td>13. Withholding details of methodology or results in papers or proposals</td>
<td>10.8</td>
<td>12.4</td>
<td>8.9 **</td>
</tr>
<tr>
<td>14. Using inadequate or inappropriate research designs</td>
<td>13.5</td>
<td>14.6</td>
<td>12.2</td>
</tr>
<tr>
<td>15. Dropping observations or data points from analyses based on a gut feeling that they were inaccurate</td>
<td>15.3</td>
<td>14.3</td>
<td>16.5</td>
</tr>
<tr>
<td>16. Inadequate record keeping related to research projects</td>
<td>27.5</td>
<td>27.7</td>
<td>27.3</td>
</tr>
</tbody>
</table>

Note: significance of $\chi^2$ tests of differences between mid- and early-career scientists are noted by ** $(P < 0.01)$ and *** $(P < 0.001)$. 

Traps and Pitfalls that Lead to Research Misconduct and the Consequences

- Sloppy Documentation
- Shortcuts, Saving Money, Cutting Corners
- Career Advancement Ahead of Everything Else
- Consequences of Misconduct
  - career
  - reputation
  - funding
  - degree and license revocation
  - sanctions and criminal charges
Case Summaries

This page contains cases in which administrative actions were imposed due to findings of research misconduct. The list only includes those who CURRENTLY have an imposed administrative actions against them. It does NOT include the names of individuals whose administrative actions periods have expired.

2017
Case Summary: Baughman, Brandi
Case Summary: Chegini, Nasser
Case Summary: El-Remessy, Azza
Case Summary: Mirchandani, Alec
Case Summary: Sauer, Frank

2016
Case Summary: Cullinan, Andrew R.
Case Summary: D'Souza, Karen M.
Case Summary: Forbes, Meredith M.
Case Summary: Li, Zhiyu
Case Summary: Mahotra, Ricky
Case Summary: Pastorino, John G.
Case Summary: Walker, Kenneth

2016
Case Summary: Anderson, David
Case Summary: Bitzegeio, Julia
Case Summary: Blaylock, Brandi Lyn
Case Summary: Briones, Teresa L.
Summary

- Research Misconduct
  - Fabrication, Falsification, Plagiarism
  - UNLV:
    - Material failure to comply with rules.
    - Material failure to disclose all Conflicts of Interest
    - An abuse of confidentiality
    - Proposing, performing, reviewing, reporting research

- NOT honest mistakes, disagreements, author rank disputes

- Questionable research practices
  - sloppy or careless research
  - statistical errors
  - inappropriate allocation of authorship
  - inaccurate references