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Research Misconduct

INTRODUCTION

All researchers in the physical and social sciences are expected to follow the principles of responsible conduct of research, or RCR.[1] Research misconduct occurs when standard codes or guidelines for correct scientific conduct are violated intentionally or through negligence so that misleading findings are made public or false credit is given to a scientist. Thus, instances of research misconduct vary widely in their origins and types. That is, researchers can violate appropriate codes in many ways. The U.S. Department of Health and Human Services and the Office of Science and Technology Policy in the Executive Office of the President identify three aspects of research misconduct:[2]

1. *Fabrication* is making up data or results and recording or reporting them.
2. *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.
3. *Plagiarism* is appropriating another person's ideas, processes, results, or words without giving appropriate credit.

In their view, research misconduct, however, does not include honest error or differences of opinion. Researchers who are aware of the ways in which fabrication, falsification, and plagiarism can occur are equipped to avoid them. Research misconduct is a very important concern because undetected violations of scientific procedures can harm the public; damage the reputations of laboratories, institutions, companies, individual researchers, and funding agencies; and damage the integrity of scientific research itself. It can also poison relationships among researchers.

Research misconduct, as the definition suggests, can occur through ignorance of correct procedures, negligence, or carelessness, or because of deliberate actions. In 1995, the National Academy of Sciences, National Academy of Engineering, and Institute of Medicine advised researchers that "someone who has witnessed misconduct has an unmistaken obligation to act."[3] Agencies handling allegations of research misconduct must try to identify clearly whether misconduct has in fact occurred (i.e., whether the allegation is true), why it occurred (and who is to blame), and how it can be avoided in the future. Such agencies also provide ways for individuals to report misconduct confidentially and without retaliation. Institutions need to have in place formal procedures (such as those established by the National Institutes of Health) for investigating these allegations and taking the appropriate steps to resolve them with the fewest possible negative consequences for all parties. These procedures should be prompt, confidential, and fair to all.

Finally, the consequences of detected research misconduct vary in intensity and type, depending on the seriousness of the misconduct and the individuals involved. Guilty researchers may have to retract published journal articles and may lose research funding and privileges. Formal letters of reprimand might be placed in their records, or they may even lose their professional positions. Students might be expelled.

Recently, for example, the *New York Times* reported that a noted Harvard psychologist took a yearlong leave after investigations by the university found evidence of scientific misconduct in his laboratory, where he was studying primate behaviors.[4] Graduate students working with the professor noted he was reporting unusual findings. The students' observation of the same primate behaviors reported on by the professor suggested a systematic distortion of the evidence in favor of the professor's hypotheses. The investigations ultimately led to the retraction of his articles by several journals. Whether the errors resulted from confirmation bias—the tendency of humans to interpret or pay attention to evidence that supports what they already believe—or from deliberate fraud is not clear, but the damage to the professor's reputation and that of the university remains. Given the long-term, self-correcting nature of scientific research, the concerned graduate students clearly took the correct action, because in the end, subsequent researchers would have countered the falsified findings.

Social science researchers might be more at risk for research misconduct than researchers in the physical sciences because the stakes may not seem so high. When a medical researcher takes shortcuts or falsifies data, people may die. When a sociologist publishes false reports, there are no clear victims. Instead, the damage is done to the body of knowledge, to the profession, and ultimately perhaps to policy making. The ethical approach is always to pursue the truth with great care. This is not always easy to do when research results are not as expected or experiments fail.

The cases in this chapter present you with stories of researchers who might be guilty of research misconduct. Can you identify the actions that might lead to allegations that the researchers in fact did behave unethically? Do you think that the other parties behaved correctly?

Notes

1. Available at the Web site of the Office of Research Integrity; see a recent update at http://grants.nih.gov/grants/guide/notice-files/NOT-OD-10-019.html.

2. Nicholas H. Steneck, *ORI Introduction to the Responsible Conduct of Research,* rev. ed. (Washington, DC: U.S. Government Printing Office, 2007), http://ori.hhs.gov/documents/rcrintro.pdf.

3. National Academy of Sciences, National Academy of Engineering, and Institute of Medicine, *On Being a Scientist: Responsible Conduct in Research,* 2nd ed. (Washington, DC: National Academies Press, 1995).

4. Nicholas Wade, "Expert on Morality Is on Leave After Research Inquiry," *New York Times,* August 11, 2010.

CASE 1. MAKING THE DATA DO WHAT YOU WANT THEM TO

Mark is writing up the findings from his study. He did an experiment inspired by his reading of fear management theory, which argues that fear of death motivates much of human behavior, so that thoughts of mortality influence what people do, often without their realizing it. He manipulated such thoughts in different ways and measured the responses of his 250 study participants. He hypothesized two main effects based on his reading of previous studies. The results, however, were not as clear-cut as he hoped they would be.

The results for the first main effect were not quite statistically significant ($p = .07$). Inspecting this analysis closely, he noticed that there were four outliers. He removed them, and the results became statistically significant ($p < .05$)—so far, so good. The results for the second main effect also were not significant, but Mark suddenly realized that by the standards of a one-tailed test, they were, so that is how he wrote them up. He then noticed that there was a significant interaction effect. Thinking about what he had found, it made perfect sense to him, so he revised his paper to reflect this important finding and proposed a new hypothesis to reflect the interaction.

Examining the interaction, Mark noticed that the pattern was interesting, so he tested the data further. His instructor, Dr. Field, had taught him how to perform a simple effects analysis, which he proceeded to do. To his delight, the unusual pattern he noticed was statistically significant. This gave him additional findings to report and discuss. He was quite pleased with the outcome and added Dr. Field's name to his paper as a coauthor before passing it to him for review prior to sending it to a journal. Dr. Field was pleased with the report. He focuses on teaching his students how to perform statistical analyses correctly. He assumed that Mark presented most of the statistics in a manner consistent with standard practice, so he had only a few comments and encouraged Mark to submit the paper.

Overall, the reviews were favorable. The reviewers were particularly happy with the reported significant interaction because it showed a new insight into the implications of fear management theory. They were also impressed with the insights from the simple effects analysis, but they wanted Mark to perform a second study in an attempt to replicate his findings. Mark was pleased with the reviews, but he felt he should not have to replicate his findings; after all, he never read any papers in the journals that seemed to include replications. He is thinking of arguing with the editor or sending his paper to another journal.

Learning Objectives

1. Students should see that there is more to statistical analysis than running the program correctly. These analyses are performed within a context of null hypothesis testing and correct handling of the data. Interpreting results is not unambiguous.
2. Students should understand that there are ethical dimensions to interpreting and reporting the results of a statistical analysis so that readers are not misled by the report.

Questions

1. Did Mark perform his data analysis correctly?
2. Did Mark mislead the readers of his report? If so, did he do this deliberately? That is, at what point, if any, did Mark's combination of eagerness to report "statistically significant" findings blend into an ethical violation of his responsibility as a scientist?

3. Did Dr. Field fulfill his responsibility as Mark's instructor?
4. Is Mark's response to the reviewers proper?

CASE 2. WHEN HYPOTHESES ARE NOT SUPPORTED

Frank Lewis is writing up the results of a study he conducted. The purpose of the study was to test three hypotheses he derived from a well-established theory. He read most of the published literature on this theory and worked out a new implication that he thinks will explain some social phenomena that previous studies have not unambiguously explained. He is very proud of this work. He collected data by surveying a large sample ($n = 150$) of college students and performed the statistical analyses. He has just finished his data analysis and is writing the results section of a manuscript to show whether the findings support or do not support his hypotheses.

The data analysis went smoothly. Frank's questionnaire operationalized 6 dependent variables (2 for each hypothesis) and 6 independent variables derived from the theory. Each of the 12 variables was measured by four items, which Frank wrote himself to measure his constructs. Frank was careful to perform a factor analysis of each variable's four items to determine if they formed a unidimensional scale. Then he computed the internal consistency of each scale. These were all acceptable. Thus, he added up each variable's four items to form a summed score and continued with the analysis.

To test his hypotheses, Frank correlated the 6 independent variables with the 6 dependent variables. When he examined the correlation matrix, he was very pleased with the results. Two of the correlations ($r_1 = .23$, $r_2 = .22$) were statistically significant at the .05 level. One correlation related to hypothesis 1, and the other to hypothesis 3. For hypothesis 2, however, there was little support. Although Frank was disappointed with this, he has revised the paper to present only the two hypotheses for which he has support. He will leave the unsupported hypothesis for another time. He has decided to report only these correlations and not the entire matrix because he feels there is no need to make the manuscript too complicated.

In the discussion section of his paper, Frank addresses the obvious limitation of his study (convenience sample of students) and includes a standard call for future studies to replicate the findings, confident that confirming evidence will be forthcoming. His paper completed and submitted, he waits for the reviews, confident that his manuscript will be accepted.

Learning Objectives

1. Students should gain an understanding of what constitutes a real test of a hypothesis.
2. Students should examine the issue of post hoc revision.
3. Students should see that technically improper data analysis could lead to unwitting ethical ambiguity.

Questions

1. Has Frank been diligent in discussing the limitations of his study?
2. Has Frank made any errors in his data analysis?
3. Has Frank behaved ethically in reporting the results of his study?
4. To what extent is Frank's behavior consciously ethical or unethical? That is, could he be both well meaning and unethical at the same time?
5. What are some possible alternative courses of action for Frank?

CASE 3. THE ROLE OF THE EMBEDDED RESEARCHER

Melinda was getting her Ph.D. in technology management at an urban university. For her dissertation, she was investigating the adoption of a new health information management system by a large medical complex. Her research required her to interview and study the principal decision makers at the hospital, including doctors, administrators, and division heads. She contacted the hospital to introduce herself and discuss the possibility of her collecting data by observing and interviewing the decision makers during the several months it would take for their review and evaluation of the new technology. To collect appropriate data, she would have to be able to review relevant documents, attend meetings, and interview specific individuals repeatedly to trace the course of the decision-making activity to see if it fits with the standard adoption model.

Things went well for Melinda. She presented her proposal to several top administrators, who were interested in learning more about this adoption activity because the hospital was itself only part of a larger health care provider

corporation that would be confronted with this decision in different forms many times in the foreseeable future and wanted to learn how best to manage the process. Thus, Melinda was given qualified access to documents, meetings, and individuals, provided she followed all the rules guiding ethical practice in qualitative research. For example, she was not allowed access to confidential patient records or to most of the financial data of the corporation. She had to obtain consent from any person she interviewed and permission to attend any specific meeting. Moreover, she was to guard the confidentiality of the corporation and all interviewees. Her report could be published as her dissertation, but the specific identities of her sources of information were to be disguised or hidden from the reader.

Melinda developed a consent form for her interviewees in accord with the IRB rules at her university. This form clearly stated the purpose of her study, explained the nature of the information she was seeking, and promised confidentiality.

The research progressed for several months, and Melinda gradually became an accepted part of the hospital setting. She toured the facility, attended meetings, read documents, and interviewed several people, all of whom had signed her consent form. All was going according to plan. Then, one day, she was reading some new reports on the progress of the technology and its adoption that raised a related but quite different aspect of the project that she had not anticipated. She realized that this new information and the topic it described, while tangentially related to her study, raised a host of new issues and problems that the standard model did not address. It occurred to her that in addition to just testing the model, she might be able to propose an important modification of it, thereby "making her mark" academically. With great excitement, she subtly altered her research protocol to explore this new topic and repeated many of the interviews to discover what she could find out about this new idea.

A problem arose, however. At the outset, several doctors had refused to sign her consent form and to be interviewed. Whatever their reasons, this was only a minor inconvenience to the original study, but with the shift in emphasis to the new issue, Melinda realized she needed to learn some specific information from these particular doctors. What to do? She was sure that they would be no more willing to help her now than before. To cope with this difficulty, she began to probe her informants for their opinions of the nonparticipating doctors' attitudes and opinions about the technology. This was juicy gossip and had a titillating quality to it, several of the informants with whom she had built good rapport were eager to share the content of conversations that took place at meetings she was not allowed to attend but at which the doctors had voiced their opinions in no uncertain terms. It turned out that two camps were forming, the minority consisting mostly of doctors and the majority made up mostly of staff and administrators. Melinda exploited the

growing antagonism between these groups to gather as much information as she could about her new issue.

When the project was done, she successfully completed her dissertation and earned her Ph.D. She dutifully shared the results with the company managers in a report and in a detailed PowerPoint presentation, and they were happy with what she told them. However, after starting her first year as an assistant professor, she published an article in a major journal in her field describing the new insight she had formed from the second part of her study that she had not shared with the company. Much of it was gleaned from the secondhand information she had gathered.

Learning Objectives

1. Students should see that hearsay is not the same thing as a direct response from a subject.
2. Students should learn that informed consent is like a curtain that protects subjects if they refuse to consent. Those who do not consent should be left out of the study.
3. Students should learn that qualitative research does not allow the researcher to maintain as much distance from the situation being examined as more quantitative research might.

Questions

1. Was Melinda's behavior entirely ethical? Why or why not?
2. What are her responsibilities toward her informants?
3. How should Melinda report the findings that came through hearsay?