

Data Manipulation by Undergraduates and the Risk of Future Academic Misconduct

Julio F. Turrens
University of South Alabama

Elizabeth Davidson
Arizona State University

Academic misconduct among undergraduates takes many forms, and sometimes may not even be intentional. For example, it is not uncommon for undergraduates to manipulate data obtained in the laboratory so that the final graphs look as students **perceive** they ought to look. This is in part because students are aware of the expected outcome of the experiment, may suspect that they have done something wrong if their results differ from what was expected and think that they will receive a lower grade if they show their real results.

It is the responsibility of the instructors to make students understand that, due to a variety of experimental errors, outliers are expected as part of the data. Furthermore, students need to learn that data manipulation constitutes a form of misconduct. Complacency towards data manipulation sends the wrong message: students do not realize that altering data is ethically wrong and as a result they move down the slippery slope, adopting unacceptable new standards.

Recent studies have shown that the proportion of students involved in academic misconduct (knowingly or not) has increased over the past 20 years to alarming values (between 75 and 98%, depending on the articles).^{1,2} Intentional cheating has also increased in recent years. For example, the internet has provided a fantastic tool for students to become involved in plagiarism. Cutting and pasting paragraphs from Internet articles on a term paper is a problem that, unfortunately, many of us have become familiar with. Moreover, Internet companies have flourished both instigating cheating (www.schoolsucks.com, www.academictermpapers.com, etc.) as well as preventing Internet-related plagiarism (www.plagiarism.org).

Once again, we as faculty can do a lot to prevent plagiarism by setting clear rules (for example, requesting copies of the literature used in the study) and taking a little time to investigate those reports that look suspicious. In many cases plagiarism may be detected by simply searching in the internet for a string of words from the suspected paragraph in quotation marks. The result of these searches usually produces the document from which the text was originally taken.

The incidence of misconduct appears to decrease substantially in graduate school. Yet, a study carried out in several medical schools³ showed that, although relatively few students were involved in misconduct, a majority of those students who acknowledged having participated in misconduct had also cheated as undergraduates. Therefore, one should expect that an increase in the proportion of undergraduates involved in academic misconduct should result in an increased incidence of misconduct during post-graduate training.

More studies are needed to determine whether the extent of academic misconduct among graduate students is the same in all disciplines. For example, although this is a broad generalization, one can say that most pre-medical students tend to be more competitive than pre-scientist students. Could this determine that the proportion (small as it may be) of medical students involved in misconduct is larger than the proportion among graduate students in the sciences? Or could it be, perhaps, that the need for success (for example, post-doctoral opportunities in cutting edge laboratories, appointments at prestigious institutions, etc) makes a small proportion of all pre-professionals participate in misconduct?

research responsibility:

In any case, faculty should actively work towards reversing this trend by clearly communicating their expectations to undergraduates. Instructors must provide students with the foundation for ethical conduct in the laboratories, lecture courses, and in research in general, openly explaining and discussing what constitutes plagiarism, data fabrication and manipulation. Otherwise, the lack of communication between faculty and students concerning academic standards leads to a difference in perception of what constitutes misconduct.

References:

Graham, M. A., Monday, J., O'Brien, K. and Steffen, S. 1994. Cheating at small colleges: An examination of student and faculty attitudes and behaviors. *Journal of College Student Development*. 35: 255-260.

Genereux, R. L. and McLeod, B. A. 1995. Circumstances surrounding cheating: A questionnaire study of college students. *Research in Higher Education*. 36: 687-704.

Baldwin, D.C. Jr.; Daugherty, S.R.; Rowley, B.D. and Schwarz, M.R. 1996. Cheating in medical school: a survey of second-year students at 31 schools. *Acad. Med.* 71: 267-273.

— Julio F. Turrens is Professor in the department of Biomedical Sciences and Director of the Undergraduate Research Program at the University of South Alabama. In addition to several courses in biochemistry, he teaches a course entitled "Issues in Biomedical Sciences" in which students discuss a variety of bioethical problems and issues concerning research integrity.

— Elizabeth W. Davidson is Research Professor in the Department of Biology at Arizona State University, Tempe, where she teaches a course entitled "Professional Values in Science."

focus

a theme for mentoring undergraduates

CUR Undergraduate Researchers' Grad School Registry

The Council on Undergraduate Research has initiated a Registry of Undergraduate Researchers trained in North America who wish to attend graduate schools in the U.S. The purpose of this registry is to facilitate matchmaking between undergraduates with research experience who wish to pursue an advanced degree, and graduate schools seeking high quality students who are well prepared for research.

Subscription fees paid by graduate schools to access the registry will be used to support CUR's Undergraduate Summer Fellowship Program.

For every three departments (or one graduate school) that subscribe to this service, we will be able to offer one summer fellowship including student stipend and funds for small equipment/supplies or travel to a scientific meeting. One hundred percent of the subscription fees will go to support the summer fellowship program.

Grad Schools: don't delay, schools are registering!

Register now to obtain data on undergraduates with graduate school aspirations and undergraduate research experience! **You can register as a school or as an individual department.** If you are an administrator or graduate department chair and would like more information on the program or how to become a subscriber to the database use this URL:

<http://www.cur.org/ugreg/GradSchools.html>

Are your students registered?

Remind them to register now as grad schools are now registering for access to the data.

Registration for students is free!

Give them this URL:

<http://www.cur.org/UGRegistryStudents.html>