Incorporating Hands-On Data Analysis into Sociology Courses

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Background

The Sociology department recently concluded a thorough review and restructuring of its undergraduate curriculum. In the course of our discussions, one recurrent theme was that most undergraduate courses involve too little hands-on research.

The Department is noted for its exceptionally wide range of undergraduate methods courses. These include ethnographic (106ABC), conversation-analytic (CM 124AB), and comparative-historical (110) as well as mathematical, statistical, and demographic methods (M18, 104, 109AB, 112, 113, and 116). All of these courses involve intensive hands-on data analysis.

Yet while methods courses teach students to work with data, there is a sharp disjuncture between methods courses and substantive courses in most areas. Most substantive courses involve little or no hands-on data analysis. At a time when sociological data is more easily accessible than ever before, our students continue to learn in the most traditional, least exciting way.

The exponential growth in the availability of online data -- and in user-friendly tools and techniques for data analysis -- offers exciting opportunities for teachers to incorporate hands-on data analysis into a wide range of Sociology courses. At the same time, the rapidly growing -- and rapidly changing -- online research environment also requires a new type of information literacy on the part of students (and faculty!).

Aims

The project has the following aims:

- Incorporate hands-on data analysis into selected core courses
- Educate department faculty about the possibilities for incorporating hands-on data analysis into other undergraduate courses
- Design two new 1- or 2-credit upper division data analysis lab courses, one focusing on the U.S. as a whole, the other on the L.A.
- Work with library staff to design a 1-credit information literacy module to accompany selected Sociology courses
- Mentor graduate students involved in the project
Activities

Working together with a group of four graduate students, I propose to pursue these aims through the following specific activities:

(1) Incorporate hands-on data analysis into selected core courses. As part of the recent review and restructuring of the undergraduate curriculum, the department voted in February to establish a set of "core" courses.\(^1\) We will select four of the newly designated core courses, choosing from among those that do not ordinarily involve hands-on data analysis, yet could be enriched by such a component.\(^2\) The prospective core courses are all large undergraduate lecture courses, enrolling between 75 and 150 per offering; some are already offered twice per year, and others will probably have to be offered twice a year once the new core requirement is in effect. Although majors will be offered priority enrollment in these courses under the new structure, they are taken and will continue to be taken by substantial numbers of non-majors as well.

For each of the courses we select,\(^3\) we will do the following:

- **Consult with those who have taught these courses** about how hands-on data analysis might usefully be incorporated, in ways consistent with the aims of the course
- **Identify appropriate sources of online data and analytic tools** consistent with the skills of students
- **Design web-based instructional modules** built around hands-on assignments. This will require us to:
  - Specify the broad problem area
  - Formulate specific research questions
  - Specify the tools, data-analytic techniques, and data sources to be used
  - Develop appropriate tutorials, where necessary
  - Implement the module on the web

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\(^1\) Majors will be required to take at least 3 upper division courses from a set of 12 "core" courses, including at least one such course in each of three broad core areas.

\(^2\) The list of core courses has not yet been finalized by the Department. The preliminary list includes two courses -- Social Demography (116) and Stratification (157) -- that already involve a good deal of hands-on data analysis, as well as two other course -- Self and Society (130) and Social Psychology (132) -- that may not lend themselves especially well to hands-on data analysis. Most of the other likely core courses, however -- Deviant Behavior (145), Urban Sociology (158), Economy and Society (173), Family (174), Race and Ethnicity (156), Gender (162), Political Sociology (182), and American Society (185) -- could be enriched by incorporating hands-on data analysis. We will select four courses from among this subset of likely core courses.

\(^3\) The selection of specific courses will depend (1) on the interests, skills, and teaching experience of the students selected to work on the project; and (2) on the receptivity of faculty who regularly teach these courses to this initiative. This is why I do not specify the courses at this time.
• Provide training to faculty to familiarize them with on-line data sources and data-analytic tools and techniques

GSRs will work in two-person teams, with each team having primary responsibility for two courses. We will meet weekly as a group to review and discuss each team's work.

(2) Educate department faculty about the possibilities for incorporating hands-on data analysis into other undergraduate courses. Although we will give particular attention to four core courses, we will also work more broadly with department faculty to inform them about sources of online data and about user-friendly data-analytic tools and techniques. The rationale for this is that many faculty are simply not aware, or are only vaguely aware, of the new pedagogical opportunities afforded by easily available online data and user-friendly analytic tools.

The best way to educate faculty about these opportunities is not to tell them, but rather to show them what resources are available and how they can be used. We propose to do so by running a series of pedagogic workshops for department faculty. Each GSR will have primary responsibility for planning and conducting one workshop. Student-run workshops may be complemented by presentations by faculty or by the consulting staff of Academic Technology Services.⁴

Workshop topics might include the following:

• Introduction to Stata
• Using Stata to analyze 2000 census data
• Using the user-friendly StudentCHIP software developed by the Social Science Data Analysis Network (SSDAN) to analyze census data
• Using GIS software to map ethnic and racial residence patterns
• Using simulations to model segregation processes

As part of the effort to educate faculty about new teaching resources, we will develop a new section of the department website devoted to such resources.

(3) Design two new 1- or 2-credit upper division lab courses, one focusing on the U.S. as a whole, the other on the L.A. These could be entitled "America Online" and "LA Online," respectively. These experimental courses, to be held in one of SSC's computing labs, would use online resources to analyze major trends and patterns in American society and in the LA metropolitan area. Emphasis would be placed on hands-on data analysis. Topics might include the following:

• Wealth and poverty
• Changing family forms

⁴ Michael Mitchell, an expert on Stata with Academic Technology Services, gave a very successful presentation on Stata to an innovative sociology undergraduate seminar offered by Roger Waldinger last quarter. He has indicated that he would be very happy to make a presentation to sociology faculty next year; and that his office would be very enthusiastic about supporting this initiative in any way they can.
- Race and ethnicity
- Culture wars
- Regional distinctions and spatial patterns
- Religion
- Social mobility
- Communications technology and the Internet.

Techniques might include the following:

- Analysis of online data sets using standard statistical packages such as Stata\(^5\)
- Online analysis of census data using simplified, user-friendly software developed by the Social Science Data Analysis Network\(^6\)
- GIS mapping\(^7\)
- Simulations\(^8\)

Students will work in two-person teams, with one team responsible for designing each course. Courses will be designed on the web, with web-based modules for each topic.

(4) **Work with library staff to design a 1-credit information literacy module to accompany selected Sociology courses.** Part of the UCLA Library's Information Literacy Initiative involves the creation of 1-unit information literacy modules associated with particular substantive courses. Eleanor Mitchell, Director of the Information Literacy Initiative and head of College Library, has indicated that the library is very interested in working with Sociology faculty to develop a broader information literacy module that could be associated with several Sociology courses -- or perhaps eventually even a module for Sociology as a whole.

We propose to begin by working with staff of the Information Literacy Initiative to develop a module to accompany core courses in the area of Power and Inequality.\(^9\) The aim of such an information literacy module would include the promotion and facilitation of hands-on data analysis, but would extend to other aspects of information literacy for sociologists as well. In designing this module, we would of course work with faculty who regularly teach these courses.

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\(^5\) For a course using Stata, we would require Sociology 19 (Sociological Research Methods, a new lower-division course) as well as a lower-division statistics course (Sociology 18, Statistics 10, or Statistics 12) as prerequisites. (These are required of Sociology majors in any event.) This will ensure that students have already been exposed to Stata or similar statistical packages, which, in turn, would mean that Stata could be used with minimal start-up training time.

\(^6\) [http://www.ssdan.net/index.shtml](http://www.ssdan.net/index.shtml)

\(^7\) See [http://www.geog.port.ac.uk/gbhgis/sampler1/sampler1.htm](http://www.geog.port.ac.uk/gbhgis/sampler1/sampler1.htm) for an example of the use of GIS to examine the history of the North-South Divide in Britain.

\(^8\) See the extensive use made of simulations in Honors Collegium 69, *Artificial Life, Artificial Culture & Evolutionary Design*: [http://www.sscnet.ucla.edu/geog/gessler/03-alife-aculture-evodesign/](http://www.sscnet.ucla.edu/geog/gessler/03-alife-aculture-evodesign/)

\(^9\) The four core courses tentatively included in this area include Race and Ethnicity, Stratification, Gender, and Political Sociology.
(5) **Mentoring graduate students.** I will meet as a group with GSRs each week for 2-3 hours during Winter and Spring quarters. I will work with students not simply in their capacity as GSRs, but in their capacity as apprentice teachers. As the students work together with each other and with me on the several components of the project, they will at the same time be developing their own teaching skills in a variety of ways. Working on this project over two quarters will leave them better equipped for their own future careers as teachers, and better prepared to make hands-on analysis of data central to their own undergraduate teaching.

**Personnel**

I will undertake this project together with four sociology graduate students during winter and spring quarter 2004. Students will be selected based on the following criteria:

- Familiarity with the substantive content of the courses we will be working with (past TA experience in these courses will be especially valuable)
- Data analysis skills
- Pedagogic skills, especially ability to explain strategies and techniques of hand-on data analysis
- Familiarity with web-based teaching resources
- Web programming skills

**Timeline**

Preliminary work will be done in Fall 2003; major work will be carried out in Winter and Spring 2004.

**Fall 2003:**

- Recruit GSRs for project
- Select set of 4 core courses to focus on

**Winter 2004**

- Core courses: consult with faculty of core courses; identify appropriate sources of online data and analytic tools; begin to design instructional modules
- Educating department faculty: plan workshops
- Lab courses: explore advantages and disadvantages of Stata vs much less sophisticated but more user-friendly StudentCHIP in analyzing census data; map out topics for lab courses; begin to design week-by-week topics
- Information literacy: consult with staff of Information Literacy Initiative; examine examples of information literacy modules prepared for other social science courses
- Mentoring: meet weekly for 2-3 hours with students
Spring 2004

- Core courses: continue to design instructional modules; provide training to faculty
- Educating department faculty: conduct series of pedagogic workshops; develop section of departmental Web site devoted to on-line data sources and the incorporation of online data analysis into teaching.
- Lab courses: complete design of week-by-week topics
- Information literacy: design information literacy module
- Mentoring: meet weekly for 2-3 hours with students

Conclusion

I recognize that this proposal may be somewhat overambitious. It may not prove possible, in the space of two quarters, to fully carry out every activity specified here. Some flexibility will have to be allowed. Still, taken severally and together, the activities envisioned here will help faculty take fuller advantage of exciting new opportunities to incorporate hands-on data analysis into a wide range of Sociology courses.