

Introducing Ethics to Geography Graduate Students Using Various Instructional Materials
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Case Studies

In addition to introducing case study one in lecture, I had students work through case studies two, three, and four (see below) during class in small groups of three to four students, during which I purposefully left the room.

Case 1: Authorship

A graduate student writes a master's thesis and her advisor indicates that the thesis is of publishable quality. The advisor provides guidance on the thesis, but the student did the bulk of the research and writing. The advisor encourages the student to write an article based on the thesis, but the student does not wish to take the time to write the article, although she is willing to edit the article, if the advisor writes it. The advisor indicates that he is willing to write the article, presuming that the student's name is included as a co-author. After some discussion, the faculty member and student agree that the faculty member's name will appear first on the article. Is this appropriate?

Case 2: Map symbolism

When constructing a proportional circle map, two basic scaling methods are possible: mathematical and perceptual. In mathematical scaling, circles are sized in direct proportion to the data (i.e., a data value twice as large has a circle twice as large), whereas in perceptual scaling circles are sized to account for perceived underestimation of larger circles (see Figure 1). The net result of perceptual scaling is that there is a greater difference between the smaller and larger circles, but the overall pattern is similar to mathematical scaling. Perceptual scaling can be modified, however, so that rather than simply accounting for perceived underestimation of larger circles, the differences between the smaller and larger circles are exaggerated: this is known as arbitrary scaling (see Figure 2).

A researcher writing an article for the *The New York Times* wishes to stress the differences in the percentage of out-of-wedlock births in various U.S. metropolitan areas. Thus, she utilizes the arbitrary scaling approach shown in the right-hand map shown in Figure 2. Is arbitrary scaling ethically appropriate?

Figure 1. A Comparison of mathematically and perceptually scaled circles.

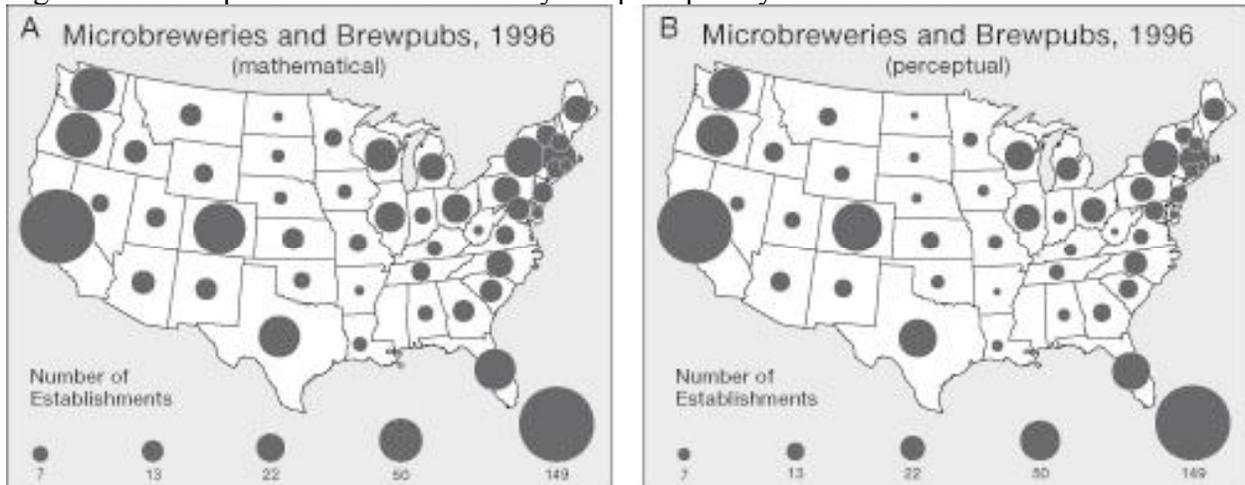
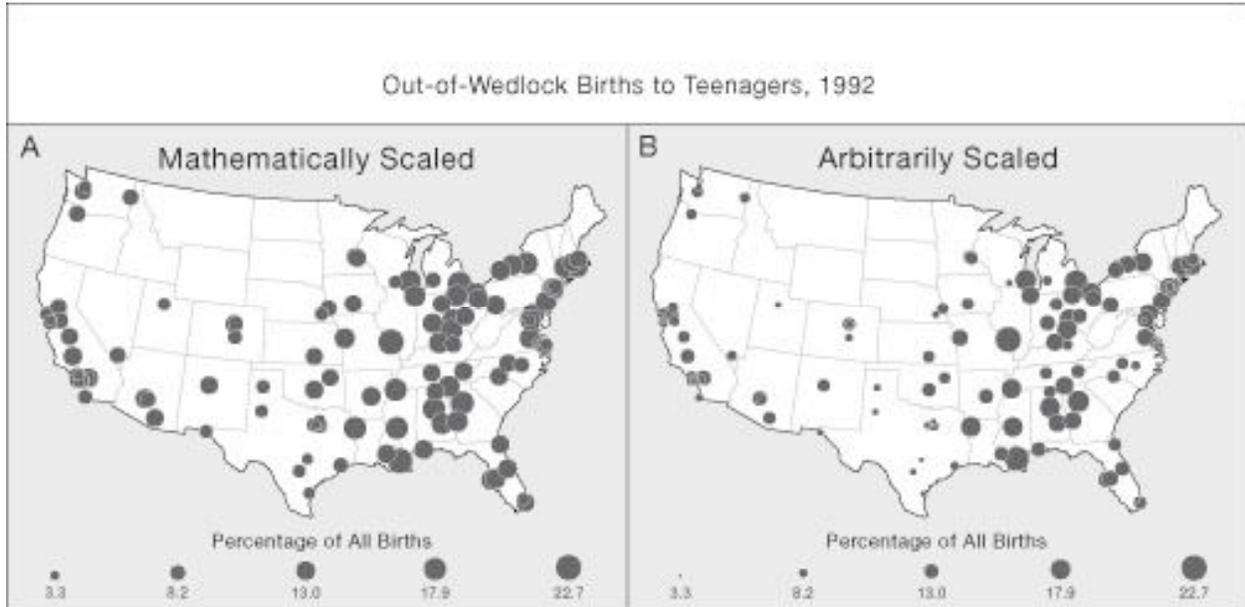


Figure 2. A Comparison of mathematically and arbitrarily scaled circles.



Case 3: Negotiating the social relations of research in an international context
(Courtesy of Professor Chris Brown, University of Kansas)

A researcher goes to a Third World country to study whether development project funds from the World Bank to groups of disadvantaged groups of small farmers, rubber tappers, and indigenous peoples have led to changes in the political scene at the county level in the state of Rondonia, Brazil in the Amazon. A surrogate measure for "changes in politics," the dependent variable, is changes in voting patterns (percent votes for leftist candidates at various levels of government), and these data are available on the web.

Details of the project development funds (amount of money, the particular community groups in the county that are funded, etc.), the independent variable, are "public documents," and should be available for people to see. The state government group that holds the documents, however, can block access to them by foot-dragging, demanding bribes, etc. The researcher has to work through personal contacts over a period of time to get access to these documents, but the researcher also knows that if those contacts knew that the research involved the study of the impact of these projects on politics (the dependent variable), that the access may be denied, due to the desire of the state government agency holding the documents to appear politically neutral. Is it ethical or unethical for the researcher to withhold information on the research project's dependent variable from the state government officials holding the information on the independent variable?

Case 4: Caribou migration routes

(After an example provided in "Ethics Education for Future Geospatial Technology Professionals" at https://www.e-education.psu.edu/files/sites/file/caribou_case.pdf)

(<https://www.e-education.psu.edu/research/projects/gisethicsproducts>)

An environmental consulting firm in Alaska is hired by a natural gas utility to produce a map of a proposed pipeline through a portion of northeast Alaska in preparation for a public hearing (a hearing attended also by potential funders for the project). The company already has a pipeline route in mind but wants to assess this further within the context of the physical landscape, private land ownership, and public lands data. In the end they want to choose the shortest, most direct route to minimize capital expenditures for construction and pipeline efficiency.

A GIS analyst within the consulting firm is assigned to this project and proceeds to gather all pertinent data including existing topographic maps (DEMs), potential landslides, land use, land cover, geologic fault, soils, roads, railways, streams, station points, resident locations, administrative boundaries (including land ownership), vegetation, regulatory data, and subsurface seismic data. The project will use these data to analyze a variety of variables, such as slope of terrain; number of stream, road, and railroad crossings; existing laws and regulations (e.g., proximity to wetlands, costs associated with right-of-way, etc.); and proximity to population centers. The analyst plans to use these variables to define an optimum pipeline route.

The analyst also has access to caribou migration routes throughout the region from the U.S. Fish and Wildlife Service. Although the proposed path of the pipeline itself will not fall within wildlife refuges, the migration corridors for this important species move beyond the reach of refuges. In fact the analyst found that these migration routes intersect the proposed pipeline at several points. The analyst brings this finding to the attention of her supervisor. For reasons unknown to the analyst, the supervisor instructs her to remove the caribou migration routes from any maps prepared for the public hearing. What should the analyst do?