

LAB RESEARCH PROJECT: THE BIG PICTURE

Two General Points to Keep in Mind

Read all instructions for this project carefully. These instructions, and instructions that will be distributed for future phases of this project, contain important information that I will not mention in class or in lab. If you are not aware of all the expectations presented in the instructions, you will probably not be able to complete the project successfully. You should therefore read these, and all future instructions, carefully, and ask me if you have any questions about them.

The instructions that will be distributed for this project are not meant to be a template that can be applied in the same way to every project. There will almost surely be a great deal of diversity in the topics chosen by the different groups in this class. As you read the instructions, keep in mind the fact that some parts of them will apply very nicely to your project, but other parts may not. Instead of following the instructions like a rigid list of tasks to complete, try to understand the broad objectives each stage of the research is meant to achieve, and then use your judgment about the best ways to achieve those objectives in the context of your particular project. This may mean deviating from a literal, step-by-step execution of every specific task described in the instructions. Deviations made for such reasons are appropriate—in fact encouraged. Just be sure that you understand why you are deviating—why your alternate approach is a better way of accomplishing the goals of the assignment than a literal interpretation of the instructions.

Overview of This Project

This description of the steps that will be involved in your research project is meant to give you an idea of how to organize your thinking and work, but original research rarely proceeds this neatly. In practice, you may need to do a couple of steps simultaneously, or do some of them out of the order in which they are presented here. And some of the work you do may not fall neatly into any one of these categories.

Choose a topic, find some existing literature on the topic, and identify a source of relevant data.

The topic you choose might be something you have read about in the newspaper or heard about on the news, an issue you have touched upon in another class, or simply something you are curious about. I will give you some tips about where to get ideas for topics, and where to begin finding information on topics you are interested in.

Once you have chosen a general topic, search for a few books or articles that provide a motivation or context for your investigation of your topic. A somewhat broader review of previous research will come later, but at the beginning you should find a few good studies, and use what you learn from them to inform the questions you plan to study.

Narrow down the general topic you have chosen to a specific, focused question that you believe you can gain some insight into by analyzing appropriate data. From the outset you

should have an idea of what the special “hook” of your project will be: what specific questions will you investigate, or what particular approach will you take, that reflects some special originality, interest, or relevance to specific practical or theoretical questions? ***Finding the “hook” that will make your project compelling is one of the hardest parts of the project. Choosing your topic carefully and figuring out early on what the “hook” will be will help make the entire research project go well.***

Identify a source from which you can obtain statistical data that you believe contains information that will be useful for your study. You need to pay close attention to exactly what the data set you plan to use consists of (e.g., what variables are included, what each observation represents, and what population the data were drawn from), and think concretely about how you will use that information to try to answer the question or questions you are investigating.

Review the previous research on your topic.

This is a critical aspect of your work, and you should work on it continuously all semester, at all stages of your research. Learning what other people have said about your topic may help you refine the questions you will ask, or suggest new issues that you had not previously considered. It is important to start searching for existing literature on your topic early so that you are aware, as you formulate the questions you will investigate, of the major lines of research that have been undertaken on your topic. And you should continue seeking out additional previous studies throughout the entire semester.

Your review of the previous research should be closely interwoven with the particular questions you choose to investigate for your study. Reading and thinking about previous studies that are related to yours, and discussing those studies with the other members of your group, are the best ways to develop a good “hook” for your project.

Get the data from wherever they are located (probably, but not necessarily, somewhere on the internet) and save them on your computer; then import the parts of the data that you want to work with into Stata

Exactly what this involves will depend on the nature of the data you use and the format in which they are available. I will give some general pointers about this during lab, and will also work individually with each group to deal with any idiosyncratic issues that come up in downloading and importing the data you choose to work with.

Clean and document your data.

Clean your data and check it for consistency. Generate any new variables you may want to work with. Write a data appendix that documents the definitions, coding and distributions of the variables you are working with. Examine the univariate distributions of the variables in your dataset. You should thoroughly clean and document your data before you begin analyzing it. It is often tempting to jump right into the analysis—after all, the point of the project is to learn something new about an issue you are genuinely interested in—but you will avoid many pitfalls and save yourself many hassles if you first make sure that your data are cleaned and documented.

Examine bivariate and multivariate relationships among your variables using basic graphical and numerical descriptive statistics.

See how far you can get toward answering your research questions just using basic descriptive statistics. You can often get surprisingly far.

Carry out a formal analysis of your data using appropriate methods of statistical inference. Interpret the results of your analyses, and write up your final paper.

Conduct further analyses chosen to help answer the questions your project is addressing. Think carefully about how your specific statistical results do (or maybe don't) translate into broader lessons or conclusions that you can draw from your study. Finally, write up your entire project in a polished research paper of about 14-16 pages (excluding figures, tables, appendixes and references).

Collaboration Among Group Members

Because each project is carried out collaboratively by a small group of students, *it is essential that everyone participates fully and actively*; if you do not engage seriously with this project, you will be doing a disservice to the other members of your group. Each one of you should try to provide some leadership to your group—e.g., by suggesting ideas for topics and strategies for analyzing your data, figuring out how to implement the analyses you want to do with Stata, and writing up drafts of sections of the installments and the final paper. And although it is important to provide some leadership for your group, it is also important to be flexible, open-minded, and willing to modify your ideas in light of discussions with your group and the leadership offered by others.

It is natural and appropriate for groups to divide up work among their members. You should be sure, however, that *every member of the group gets some substantial experience with every aspect of the research process that goes into the production of your final paper*. For example, it would be a very bad idea to have one person find previous literature on your topic, have another do most of the data management and analysis, and have someone else do most of the writing of the final paper. Instead, share the work for each step of the process among the members of your group. For instance, for your survey of previous research, have everyone find two or three good sources and write drafts of the commentary on them that would go into your paper. Similarly, for your data analysis, assign different parts of the analysis to different members of the group: e.g., one of you could focus on graphical and numerical exploration of multivariate relationships among key variables, another on regression analysis, and another on statistical inference concerning associations among categorical variables. For papers in future classes, and certainly for your senior thesis, you will need to carry out an entire research project by yourself, so it is important to gain some experience with all of the various skills that will be required.

Any student who flagrantly fails to collaborate in a constructive way with the other members of her or his group will be removed from the group and receive a grade of 0.0 for the lab portion of the course.

Grading

I will assign a grade to each installment for this project your group turns in, including the final paper (but not including the first installment, in which you propose several possible topics). In the calculation of overall grades for the lab/project component of the course, the final paper will be weighted somewhat more heavily than the preceding installments.

Individual student grades for the lab/project component of the course will depend partly on the grades assigned to the installments and final paper submitted by the student's group.

Individual grades will also depend on the contributions individual students make to their group projects. Students who were constructively engaged and worked collaboratively with the group throughout the entire research process will receive higher grades. Students who did not adequately participate in and contribute to the work of the group, or who did not work on all aspects of the project, will receive lower grades. Those individual grades are based mainly on my observations over the course of the semester of how engaged in the project students are, how collaboratively and constructively they work with the other members of their groups, and the nature of the contributions they make to the project.

Students who would like to share with me additional information about the nature of the interactions among the members of their group, or on the contributions made to the project by themselves or other individual members of the group, are invited to write a memo to me at the end of the semester expressing their views. If you believe that the level of engagement in the project or the contributions made to it by any particular member or members of your group were deficient, you should feel free to write about that in your memo. But if you have criticisms or complaints about the work of someone else, please hold yourself to a high standard of fairness and objectivity when you describe the situation. If your memo is written responsibly and fairly, I will take your remarks into consideration when assigning grades to you and to the other individual members of your project group.

Due Date for Final Paper and Schedule of Installments

For groups with one more seniors, the final paper is due on Saturday, May 9, at 5:00 PM.

For groups with no seniors, the final paper is due on Friday, May 15, at noon.

Four installments, each comprising a step toward the final paper, will be due over the course of the semester. You will be given detailed instructions for each of these installments. Each installment must be turned in at the beginning of class on the day it is due.

Installment 1: Topic and data ideas. Due Friday, February 13.

Installment 2: Project proposal. Due Friday, March 6.

Installment 3: Data report. Due Monday, April 6.

Installment 4: Preliminary draft. Due Friday, April 24.