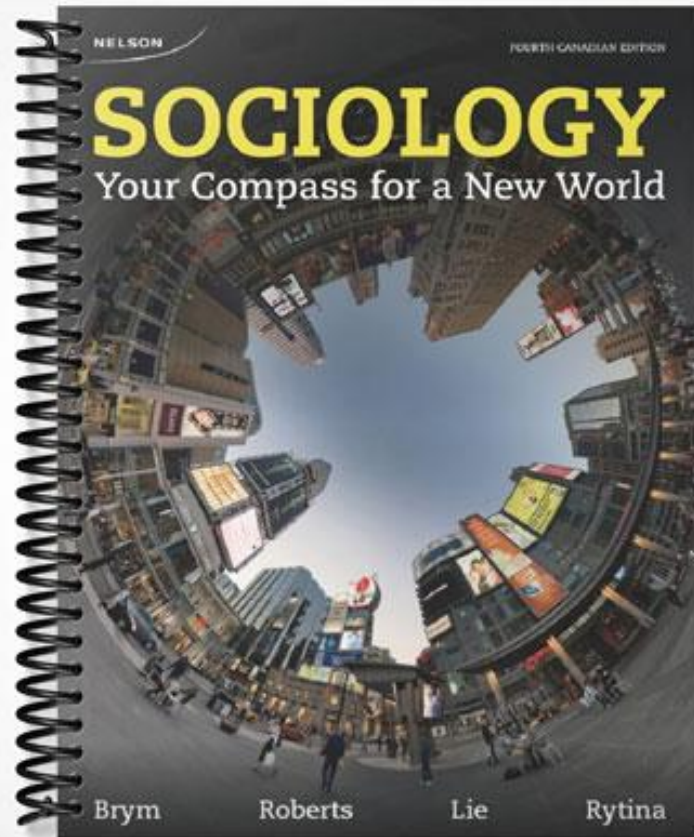


# SOLUTIONS MANUAL



## CHAPTER 2 – HOW SOCIOLOGISTS DO RESEARCH

### 1. Learning outcomes (with Bloom’s taxonomy)

After completing this chapter, students should be able to:

- **Understand** how scientific knowledge differs from other forms of knowledge (e.g., common sense) and demonstrate their ability to **Evaluate** various forms of knowledge and the “truth value” awarded.
- **Understand** that good sociological research is the result of combining both objective (scientific and rigorous testing of ideas) and subjective (creative insight) phases of inquiry.
- **Remember** the main methods of collecting sociological data (experiments, surveys, systematic observations of natural social settings, and analysis of existing documents and official statistics).
- **Evaluate** and **Apply** each data collection method to a research problem, considering the characteristic strengths and weaknesses of each.

### 2. Why is this chapter important to sociology students?

The legitimacy of sociology as an academic discipline requires that findings and conclusions be substantiated with and by research that has been scientifically collected and analyzed in order to be awarded “truth value.”

The social reality that students are seeking to interpret is increasingly complex and interconnected. This necessitates that students acquire and use knowledge that is objectively based in their attempts to more completely and accurately understand the social world.

### 3. Why should students care?

Many (most) students have been raised and socialized within a culture where the emphasis is (has been) on the “individual experience” as a source of knowledge and understanding. Getting beyond an individualistic (psychological) frame of reference requires exposure to, and interrogation of, knowledge that has been acquired objectively. When equipped with an understanding of unscientific and scientific thinking processes, the students will have the tools to more critically evaluate and analyze knowledge claims.

Students may believe that the information in this chapter has no relationship to their personal lives and that research and scientific discovery is relevant only to academics and scientists. Once they discover (are shown) and understand the materiality to their everyday experience, they will (may) begin to think more critically and objectively. As a result, they will (may) have a better

understanding of the social space they inhabit as well as experience the positive benefits and outcomes of making decisions based on evidence and the drawing of conclusions that are less biased.

#### **4. What are the common student misconceptions and stumbling blocks?**

Students may feel threatened when asked to interrogate and differentiate between knowledge based on “objective/scientific” thinking versus “subjective/non-scientific” thinking since it may challenge (call into question) what they (have been raised to) believe to be true. Sensitivity is required. Students should be made aware that knowledge acquisition (and the truth value awarded) is an ongoing process. The activity “Science as Process” highlights how knowledge categorized as “non-scientific” thinking *can become* valid knowledge based on science. Also the TEDTalk (Michael Shermer on strange beliefs), discussed below, addresses non-scientific thinking in a humorous and non-threatening way (pp. 38–40 of the textbook discusses unscientific vs. scientific thinking).

Students may believe that the scientific method is a step-by-step, linear process and researchers follow the research cycle sequentially. This view may result in the belief that there is little (or no) room for creative thinking and implies that findings are “conclusions” (end of story; no need for any further thinking or research). See the online interactive graphic referred to below in “Class Exercise” (p. 41 of the text also discusses this issue).

Many students compartmentalize their lives into academic and life outside of academia. As a result, they struggle with understanding the applicability and relevance of research to everyday living. To grasp and understand the abstract concepts of theory, dependent and independent variables, spurious association, operationalization, etc., students may require concrete demonstrations and applications in the classroom (pp. 42–49 of the text).

Many (most) students either do not know how, or may not take the time, to analyze data that is found in tables and graphs. Likewise, reported statistics (such as those found in newspapers, etc.) are taken at “face value.” Students may need time devoted to learning and practicing the skill of critical interrogation (see p. 46, “Reading Tables”).

#### **5. What can I do in class?**

##### **At the start of class:**

**Science as process:** “Chicken soup helps get rid of a cold” (p. 39 of text). Ask the students if they believe this (by a show of hands/clicker question). Some students may volunteer that it is “knowledge based on tradition.” Discuss Dr. Stephen Rennard’s findings that chicken soup could

in fact reduce inflammation in vitro (<http://www.pbs.org/saf/1210/features/know2.htm>).

Rennard's chicken soup study, formally titled "Chicken Soup Inhibits Neutrophil Chemotaxis *In Vitro*," was published in the scientific journal *Chest*, in 2000, volume 118, pp. 1150–1157.

Highlight the fact that science is also instrumental for validating what may be currently regarded as "invalid knowledge."

**Mini quiz:** (on the assigned chapter/reading for this class session) Begin with five multiple-choice questions for the students to answer. These questions can be selected and utilized as a "framework" for what you will be covering in the session.

**Begin with a question:** Ask the students (either by a show of hands/utilizing a clicker slide) what they expect their final grade in the course to be. Having utilized data from the class and institution (number of students/acceptable class average), present them with a normal curve chart that you've prepared delineating the number of students that will attain the A's, B's etc. In addition to introducing the students to "statistics," it demonstrates to the students that not everyone may get the A that she or he is expecting. This exercise has proven effective in communicating to students that they must be willing to expend the time and energy engaging with course material to get a "good grade." Be prepared for some lively discussion about "norms" and "averages."

**Begin with a "survey question":** Ask the students (either by a show of hands/utilizing a clicker slide), which web browser they currently use (Internet Explorer/(Mozilla) Firefox/(Google) Chrome/Safari/ Opera/Android). Discuss the findings of a "research study" headlined by various news media outlets (CNN/The Telegraph/BBC/Forbes, etc.) that reported Internet Explorer users are "less intelligent" (have lower IQ's). *Note: It was determined within three days that this study was a hoax, but it demonstrates that how we, as a society, need critical thought, statistical skills and skepticism.* (See <http://www.telegraph.co.uk/technology/internet/8674678/Internet-Explorer-users-have-below-average-IQ.html> for article and links.)

**Throughout the class:**

**Class exercise (instructor led):** Select a research question and collectively work through (discuss) the research cycle. University of Berkeley has an online "interactive" graphic (entitled "The *Real* Process of Science") that demonstrates the non-linearity of the research process—how "science circles back on itself so that useful ideas are built upon and used to learn even more about the natural world." Available at [http://undsci.berkeley.edu/article/howscienceworks\\_02](http://undsci.berkeley.edu/article/howscienceworks_02). [Understand/Apply]

**Think/Pair/Share or Small group discussion:** "Is Nearsightedness in Children Linked to Night Light Exposure During Sleep Before Age Two?" Original research study says yes (published in the May 13, 1999 issue of *Nature*). Two subsequent studies (published in the March 9, 2000 issue of *Nature*) shows no association. Science NetLinks has created a student worksheet that

concisely summarizes the studies and includes questions for students to answer (discuss). This is an excellent exercise that demonstrates spurious association, the value of peer review, and the ongoing investigative nature of science. (Printable worksheet available at: <http://sciencenetlinks.com/student-teacher-sheets/nearsightedness-children/>.) [Understand/Apply]

**Think/Pair/Share:** Ask the students to think of an instance when they participated in a “survey” where the results would suffer from a “voluntary response” and share/discuss with a class member. [Understand/Apply/Analyze]

**Small group/Class discussion:** “Dead Grandmas & Teaching Research Questions” (Nathan Palmer, 2011) found at <http://www.sociologysource.com/home/2011/8/15/dead-grandmas-teaching-research-questions.html>. Excellent “tongue-in-cheek” exercise to discuss hypothesis, dependent variables, and independent variables. [Understand/Apply/Analyze]

**Small group/Class discussion:** If you didn’t use this in your opening—Ask the students (either by a show of hands/utilizing a clicker slide), which web browser they currently use (Internet Explorer/(Mozilla) Firefox/(Google) Chrome/Safari/Opera/Android) and then critique the study “Intelligence Quotient (IQ) and Browser Usage: Measuring the Effects of Cognitive Ability on the Choice of Web Browser” (July 26, 2011; <http://www.eldinamo.cl/wp-content/uploads/2011/07/IQ-Browser-AptiQuant-2011.pdf>). What methodological flaws can be found in this “research”? (*Note: This study was a hoax; asking the students, “Why did so many ‘intelligent’ people ‘fall for it’?” may lead to a very engaging discussion about knowledge based on authority.*) Reported on Aug. 1, 2011 in *The Telegraph* and various other news media <http://www.telegraph.co.uk/technology/internet/8674678/Internet-Explorer-users-have-below-average-IQ.html>.) [Understand/Apply/Analyze/Evaluate]

**Think/Pair/Share or Small group/Class discussion:** Ask students to think of and list/volunteer examples for the 10 types of “unscientific thinking” beyond the ones given in the textbook on p. 39 (knowledge based on tradition, authority, casual observation). This gives students the opportunity to interrogate and critique the prevalence of unscientific thinking in their own life experiences, provides them with a list that has a more personal referent, and encourages them to think beyond and outside of the textbook. [Understand/Apply/Analyze/Evaluate]

**Documentary: *The Story of Science: Power, Proof and Passion*** (2010 BBC documentary, Episode 1—*What Is Out There?*). Suggested in Chapter 1 of this manual, this could be used to address material found in this chapter: valid/invalid knowledge; scientific and unscientific thinking; and the interconnectedness of subjectivity, objectivity, and science as culture. (*Note: If used for Chapter 1, ask the students to give examples from/make connections to material and concepts in the current chapter. This demonstrates to the students the interconnectedness of the course material/lectures/discussions.*) [Understand/Apply]

**Documentary: Quiet Rage – The Stanford Prison Experiment** (Part 1: 15 min.; Part 2: 14 min.) Available at <http://topdocumentaryfilms.com/quiet-rage-the-stanford-prison-experiment/>; see also: <http://www.prisonexp.org/legnews.htm>. Ask students to make note of/consider the research question, the research design, the ethical implications, and the generalizability of the findings. Discussion of these after the viewing can then be steered toward an application to current-day situations (i.e., How do we explain/understand what happened at Abu Ghraib?). [Understand/Apply]

**TEDTalk: Michael Shermer on strange beliefs** (2006; 14 min.) Available at [http://www.ted.com/talks/lang/eng/michael\\_shermer\\_on\\_believing\\_strange\\_things.html](http://www.ted.com/talks/lang/eng/michael_shermer_on_believing_strange_things.html). “Michael Shermer shows how we convince ourselves to believe—and overlook the facts.” Students respond well to this humorous talk (subtitle enabled) that addresses a number of concepts and ideas from this chapter in a very “non-threatening” way. [Remember/Understand]

## 6. How will I know that my students have learned the LOs?

**End the class with a mini quiz:** Focus on multiple-choice questions that address the Learning Objectives of the chapter. Review and discuss the “correct” answers for each question. (The use of “clicker” technology and turning point slides are very effective for this exercise.)

**Ask the students to write and submit:** A short paragraph describing “the most important thing I learned today” **AND** explain “why” they consider it to be important (e.g., connection to real life experience).

**Ask the students (in pairs/small groups) to create and submit a question (*with answer*):** The question should address information covered in the session and could be used on an upcoming exam.

**Writing Assignment:** Students are to

1. Formulate a sociological research question
2. Select a method for conducting their research
3. Argue/discuss/explain “why” that method would/should be used

*Note: students may need assistance formulating and/or examples of “sociological research questions.”*

**Research and writing assignment:** Does playing violent video games translate to violence in real life? (e.g., high-school shooters/bullying etc.) The textbook (pp. 43, 44) discusses investigations into the connection between TV and real-world violence. Given that popular video games are increasingly more “violent,” ubiquitous, and interactive, ask the students to explore and examine research articles on this issue and report their findings.

**Group project:** Students are to collaborate on this assignment—selecting a sociological research question and designing a research study that they will present to the other class members.

**CengageNOW™:** <http://hed.nelson.com>. This online diagnostic tool identifies each student's unique needs with a Pretest that generates a personalized Study Plan for each chapter, helping students focus on concepts they're having the most difficulty mastering. Students then take a Posttest after reading the chapter to measure their understanding of the material. **NOTE: An Instructor Gradebook is available to track and monitor student progress.**

**Companion website for the textbook:** Refer the students to <http://www.compass4e.nelson.com>, which includes practice tests for this chapter, additional Web links, and other resources. Ask students to utilize this learning tool, and bring to next class any questions (difficulties) they may have in regards to information from this chapter.

## 7. How can I assess my own “performance”?

A critical reflection on my own practice: Insights and understandings:

- A. Did I get the attention of my students at the beginning of class?
  - a. What did I do? Did it work? (If so, why? And if not, why didn't it?)
- B. Did I allot (adequate) time for student dialogue/participation/engagement in the learning process?
  - a. If not, why not?
  - b. Is there any material that can (or should) be minimized or removed in order to allow for student input and participation? (sometimes, “less is more”)
- C. How could I incorporate more student input and participation? (e.g., clicker questions, think/pair/share, one-minute summaries)
- D. Were my students engaged and/or focused?

If so:

  - a. What concepts were we covering?
  - b. What precisely were they engaged with and/or focused on? (i.e., video clip, documentary, debate, small group discussion, whole class discussion)

If not:

  - a. When did I lose them?
  - b. Why did they disengage/lose focus?

- E. Did I integrate (informal) formative assessment of student learning throughout the “lecture”?
  - a. What did I do?
  - b. Did these assessments suggest to me that they understood the key concepts?
  
- F. Did I request feedback from the students on their learning (experience) in this class? i.e.:
  - a. Submission of an “aha” moment they had
  - b. Informal summary (point form) addressing two or three concepts covered
  - c. Five (ten) minutes for “debriefing” at the end (of class or topic)—“*What*” are your questions? (not “Are there any questions?”)
  - d. Refer students to an online survey (e.g., Blackboard learning system, toofast.ca)
  
- G. Some things to consider for the next class (modifications to consider when teaching this chapter again):
  - a. What worked really well and why?
  - b. What could/should/might I do differently next time to improve student engagement and learning?
  
- H. What did “I” learn? What insights did I gather from my students?

## **8. What other resources are available? [Supplementary Resources]**

American Statistical Association. Available at <http://www.amstat.org/>.

Brock, Deborah, Rebecca Raby, and Mark P. Thomas (eds). 2012. *POWER and Everyday Practices*. Toronto: Nelson Education Ltd. (See Chapter 8, “Science as Culture,” by Aryn Martin.)

Creative Research Systems. Available at <http://www.surveysystem.com/sdesign.htm>.

Doing Research in Sociology (University of Waterloo). Available at <http://129.97.58.10/discipline/sociology/research.html>.

Free Resources for Program Evaluation and Social Research Methods. Available at <http://gsociology.icaap.org/methods/>.

How Science Works (complex flow chart). Available at [http://undsci.berkeley.edu/lessons/pdfs/complex\\_flow\\_handout.pdf](http://undsci.berkeley.edu/lessons/pdfs/complex_flow_handout.pdf).

Statistics Canada. Available at <http://www.statscan.gc.ca>.

Statistics Without Borders. Available at <http://community.amstat.org/statisticswithoutborders/home/>.



Tavares, Tonya. 2008. "Analysis of Students' Misconceptions of Research Methods in Relations to Thinking Style." University of Rhode Island. Available at <http://digitalcommons.uri.edu/srhonorsprog/102/>.

Thompson, Linda. 1992. "Feminist Methodology for Family Studies." *Journal of Marriage and the Family*, Vol. 54, pp. 3–18.

Understanding Science. Website developed by the University of California. Available at <http://undsci.berkeley.edu>.

Watts, Duncan J. 2011. *Everything is Obvious: Once You Know the Answer*. New York: Crown Business.

## **9. Questions to consider with suggested answers**

### **1. What is the connection between objectivity and subjectivity in sociological research?**

Researchers require objectivity in their study of subjects and issues of interest in order to present scientific findings unbiased by personal values and opinions. Subjectivity is necessary because it envelops the creative insight and personal values of the researcher that guides (determines) the subject of inquiry.

### **2. What criteria do sociologists apply to select one method of data collection over another?**

Sociologists must consider the need for reliability, validity, generalizability, and causality for the research findings all within time and monetary constraints. The criteria are a function of the issue under examination. Each method has advantages and disadvantages; therefore, sociologists must ask themselves, "What would provide the best information?" A literature review on past and current research on the subject should shed some light on the decision.

### **3. What are the methodological strengths and weaknesses of various methods of data collection?**

Table 2.3 (p. 54 of the text) provides a summary of strengths and weaknesses.