Why Science?

Instructor Manual

Dr. Regan A. R. Gurung and Dr. Aaron Richmond, Editors
Bethany Fleck, Travis Heath, Kristy Lyons, Aliza Panjwani, Janet Peters
Kasey Powers, Amanda Richmond, Anna Ropp

This unit is comprised of one short stage-setting chapter that immediately establishes psychology as a science.

After a brief summary of the main components of what makes up a science and the utility of the scientific approach in the world today, the module illustrates the usefulness of psychology in everyday life. This quickly lets students see how psychology applies to their own lives. The module ends with an overview of ethics and reasons to learn about psychological science.

Learning Objectives

- Relevant APA Learning Objectives (Version 2.0)
    - Describe key concepts, principles, and overarching themes in psychology (1.1)
    - Describe applications of psychology (1.3)
    - Use scientific reasoning to interpret psychological phenomena (2.1)
    - Demonstrate psychology information literacy (2.2)
    - Apply ethical standards to evaluate psychological science and practice (3.1)
- Content Specific Learning Objectives - Why Science?
    - Describe how scientific research has changed the world.
    - Describe the key characteristics of the scientific approach.

- Discuss a few of the benefits, as well as problems that have been created by science.
- Describe several ways that psychological science has improved the world.
- Describe a number of the ethical guidelines that psychologists follow.

Abstract

Scientific research has been one of the great drivers of progress in human history, and the dramatic changes we have seen during the past century are due primarily to scientific findings —modern medicine, electronics, automobiles and jets, birth control, and a host of other helpful inventions. Psychologists believe that scientific methods can be used in the behavioral domain to understand and improve the world. Although psychology trails the biological and physical sciences in terms of progress, we are optimistic based on discoveries to date that scientific psychology will make many important discoveries that can benefit humanity. This module outlines the characteristics of the science, and the promises it holds for understanding behavior. The ethics that guide psychological research are briefly described. It concludes with the reasons you should learn about scientific psychology.

Class Design Recommendations

This introduction to psychology as a science is standard first day of class material. First days of class are critical to setting the tone for the course and the concise nature of this module allows for addition active learning and engagement opportunities. The suggestions below and the PowerPoint slides refer to the content in the module. Suggestions for specific first day pedagogy are listed in the framework section. Please also refer to the Noba PowerPoint slides that complement this outline.

1st class period (50 min – 75 min):

- Overview
    - What is science?
- Psychology as a science
- Utility of psychology

- Ethics
- Why study psychology?
- Conclusion

Module Outline

Scientific Advances and World Progress

- Scientific innovation by a number of researchers led to ways to make the world healthier. This opening provides examples of some famous scientists and their inventions. It helps students situate the field of psychology in the larger picture of science.
    - Jenner the father of immunology, Haber and Borlaug produced hybrid crops that helped feed millions.
    - Major social and technological changes can be linked to science.
    - Medical and technological innovation are a direct result of scientific research.

What is Science?

- Science aims to understand the natural world through testing and observation. This precursor to the module on research methods nicely lays out the key components of what constitutes a science.
    - Science uses systematic observation and empirical methods.
        - Observation leads to testable hypotheses
        - Science is democratic, a transparent joint endeavor
        - Science is cumulative

Psychology as a Science

- Psychology uses the general scientific method to study a variety of phenomenon including thoughts and feelings. Francis Galton invented self-report questionnaires and studied judgments.
    - Galton one of the first to study identical and fraternal twins to address the nature-nurture question.
- Modern psychological research is sophisticated and goes beyond the use of simple surveys.
    - Research uses advanced statistical analyses
    - Happiness is a good example of the many ways research is done.
        - Self-report, peer report, memory measures and biological measures are all used.

Psychological Science is Useful

- Psychological science creates inventions to help people live better lives.
    - For example one focus is determining which therapies are most effective.
    - Research shows some forms of therapies may be harmful.
    - Organizational psychologists show how workers can be more productive in their jobs.
    - Forensic science makes courtroom decisions more valid.

Ethics of Scientific Psychology

- Research with humans involves special protection from psychological harm.
- There are key components of the ethics of research, each with their own special role in the process.
    - Informed consent

- Confidentiality
- Privacy
- Benefits
- Deception

Why Learn About Scientific Psychology?

- To understand ourselves, other people and groups, influence others.
- To learn how to better help others and improve the world.
- To learn a skill that will lead to a profession.
- To learn how to evaluate research claims
- Because it is interesting, challenging, and fun.

Difficult Terms

Deception
Empirical

Lecture Frameworks

Overview

Your first day of class is a golden opportunity to excite students about psychology and connect them to the material. In contrast to diving straight into the material from Noba it is prudent to try a range of pedagogical techniques to start strong. This module is considerably different from most first chapters in psychology textbooks. There is no mention of the history of psychology (James the father of American psychology, Wundt, etc.), or the main different approaches to psychology (e.g., humanistic, psychodynamic, etc.). That's all right. You can wait until students are hooked on the material before addressing history, a topic most students do not latch onto until they have interest and connection with the material. You can also

provide links to psychological history as suggested in the STP Intro Psych Primer (excerpts provided below).

First Class Period:

- Discussion/Warm-Up
    - Consider starting class off by asking students what they think of psychology. Perhaps have students complete the sentence "Psychology is…". Have them discuss answers in partners, small groups, or as a whole class. Contrast lay answers to a definition of psychology as the scientific study of human behavior.
    - Generate the main topics students are interested in: Relationships, Sex, Substance use, Work, Health. Gather contemporary images reflecting each to catch their attention and discuss the areas of psychology that map onto each.
- Activity – Let's Be Psychologists
    - This activity discussed in detail in the relevant slide in the power point deck asks students to imagine they are research psychologists by having them generate ideas for the study of flirting. It is a perfect way to get students engaged in psychology and to practice asking questions about human behavior.
- Lecture – PowerPoint Slides
- Discussion – Slide: How would you try to learn about flirting behaviors?
- Discussion – Slide: How has science improved life compared to earlier times?
- Conclusion: Set the stage for the next day of class.

Activities & Demonstrations

Let's Be Psychologists: In-Class Activity

How would you study flirting?In this activity students can break into small groups to generate ideas about how they might study flirting. Not having a background in research methods might

leave some students at a loss of where to begin, but this is where group work comes in handy allowing more advanced students to help others.

You have students imagine a scenario in which no researcher has ever investigated this phenomenon (flirting) and so the students are free to pursue any direction they like. Bring them back together after 8-10 minutes for a large group discussion. The goal is to show that psychology is a systematic and controlled investigation of real world thoughts and behaviors.

Points to extract from their discussion:

1. They may have **hypotheses**, or intuitive guesses about flirting that can direct research.
2. They may discover that it is important to clearly **define** flirting in order to be able to understand and measure it
3. They may mention **measurement** strategies such as observation or surveys. This is a great entrée to introduce basic research methods and ethics.
4. They may mention **variables** such as age, gender or culture. This is a great place to point out the concept of generalizability and the necessity for conducting multiple studies.

NOTE: They may be tempted offer guesses as to research results such as "I think young people would be more likely to flirt than older people." You can point out that this represents a hypothesis and must be tested empirically. Similarly, some students may offer guesses about the reasons flirting exists (e.g. "flirting is like a peacock showing his feathers. It's how people woo one another.") Again, this is sophisticated thinking but students she be encouraged to bring the discussion back to science—how could we test whether that is the case?

Additional Optional Activity: The Matching Game: In-Class Activity

This is another great first day activity where you tell students you can bring a process that takes days or weeks in the world, into the class to see in minutes. You are going to explore how people end up with the partners they do.

- Time: 10-15 minutes.
- Materials: Playing cards or numbers on large sheets of paper.
- Directions: Bring 10 playing cards to class, five red (hearts) five black (clubs), of varying numbers and including at least two royal cards (e.g., 2, 4, 8, queen and king).
    - Select 10 students, hand each a card face down. Instruct them to place cards face out

against their forehead when you say the word.

- Have them walk around and pair up with a mate with the goal of pairing with the highest value (i.e., best mate). They can only ask "Will you be my partner?" and answer :Yes", "No". Say they can change partners as much as they want. Give students 5 minutes. Class then notes pairs.
- Introduce a new student with a new card (an ace). All students now have the chance to re-pair.
- The class notes the pairs at each stage (before and after ace). Students with cards guess their own values.

- Pairs are often similar (matching hypothesis). High values get a lot of attention, high and low value bearing students quickly guess what they have (lots or little attention).
- Variations on the Theme:
  - Have students rate their match (relationship) satisfaction before and after the introduction of the higher value contrast card.
  - Introduce a number of different contrast cards.
  - Forbid switching partners after commitment.
- For full details and more instructions and variations, see Lewis and Gurung (2003).

Ellis, B. J., & Kelley, H. H. (1999). The pairing game: A classroom demonstration of the matching phenomenon. Teaching of Psychology, 26, 118–121.

Lewis, B. P., & Gurung, R. A. R. (2003). Mixing, matching, and mating: Demonstrating the effect of contrast on relationship satisfaction. Teaching of Psychology, 30, 303–306.

Outside Resources

Web: Science Heroes- A celebration of people who have made lifesaving discoveries.
http://www.scienceheroes.com/index.php?option=com_content&view=article&id=258&Itemid=27

Evidence-Based Teaching

McGinley, J. J., & Jones, B. D. (2014). A brief instructional intervention to increase students' motivation on the first day of class. *Teaching of Psychology, 41*, 158-162.

What an instructor does on the first day of a course can impact students' motivation in the course. To build upon these prior research findings, authors implemented a first-day intervention to influence students' motivation by increasing their perceptions of course interest, course usefulness, and instructor caring. Participants in either an introductory or an upper-level psychology class got an experimental intervention or a control. The intervention allowed students to discuss the usefulness of and their interest in the course with one another and to interact with a caring instructor. Students' perceptions of course interest and instructor caring increased significantly; although perceptions of course usefulness did not.

Wilson, J. H., & Wilson, S. B. (2007). The first day of class affects student motivation: An experimental study. Teaching Of Psychology, 34(4), 226-230.

Teaching experts assert that the first day of class impacts students, with potential negative effects lasting the entire term. However, no empirical research supports this supposition. We randomly assigned students to view a video of their professor either providing a positive or negative first-day experience. Students with the positive experience reported better attitudes and more positive expectations at the end of the first day. Although several differences dissipated by the end of the first week, students with the positive first-day experience reported higher motivation for the majority of the course, and their grades were significantly higher by the end of the term.

Lucas, S. (2006). The first day of class and the rest of the semester. In S. F. Davis (Ed.), Handbook of the teaching of psychology (pp. 41-45). Malden: Blackwell Publishing. doi:10.1002/9780470754924.ch7

Although the first day of class is the most important day of the semester, many instructors use it as a "throw-away" class. Whether because of their own anxiety or because they don't see it as a "real" class session, few instructors prepare and plan for the first day as well as they do later class sessions. However, from your students' perspective the structure of the first class becomes the "norm" for the rest of the semester. Because most students have many instructors and because these instructors seldom explicitly state what student behaviors they value, students become experts at inferring instructor preferences. They take their biggest cue from how you present yourself the first day. Laying the groundwork, introducing yourself, expressing interest in the students and aspects of content coverage on the first day of class, are addressed.

Hermann, A. D., Foster, D. A., & Hardin, E. E. (2010). Does the first week of class matter? A quasi-experimental investigation of student satisfaction. Teaching Of Psychology, 37(2), 79-84. doi:10.1080/00986281003609314

Teaching experts suggest that establishing clear expectations and a supportive environment at the beginning of a college course has a lasting impact on student attitudes. However, minimal empirical evidence exists to support these suggestions. Consequently, we randomly assigned instructors to either begin their course with a reciprocal interview activity aimed at these goals or in their typical fashion. At term's end, students experiencing the activity (*n* = 187) reported greater clarity regarding their course responsibilities, more support from their instructor, and greater course satisfaction on both official evaluations and experimenter-administered measures, compared to students who had not (*n* = 190). These results contribute to a converging body of evidence regarding the effectiveness of reciprocal interviews and similar activities generally.

Suggestions from the Society for Teaching's Introductory Psychology Primer

Afful, S., & Good, J. J. (2013). Research Methods. In S.E. Afful, J. J. Good, J. Keeley, S. Leder, & J. J. Stiegler-Balfour (Eds.). Introductory Psychology teaching primer: A guide for new teachers of Psych 101. Retrieved from the Society for the Teaching of Psychology web site: http://teachpsych.org/ebooks/intro2013/index.php

POSSIBLE ASSESSMENTS (Out of Class)

Classic Readings: A list of classics full-text readings in the History of Psychology is available at:

- http://psychclassics.yorku.ca/author.htm. Students could pick an article and answer questions regarding the contributions to the larger field or identify different studies that achieved the goals of describing, understanding, predicting, and controlling behavior and mental processes.

Online Scavenger Hunt:

- Ask questions on key events, publications, and perspectives from this flash activity available at: www.learner.org/discoveringpsychology/history/history_flash.html.
- Questions might include: Who founded Gestalt Psychology? What year was the Nature of Prejudice published?

Psychology at the Bookstore:

- This assignment has students visit a book retailer to critically evaluate the portrayal of the science of psychology in the popular media. Detailed instructions available at: http://www.teachpsychscience.org/pdf/524201042305PM_1.PDF

ACTIVITIES & TECHNIQUES (In Class)

Myth busting

- True/False statements on first day regarding history and breadth of psychology as well as counterintuitive findings. (See Lilienfield et al., (2009) 50 Great Myths of Popular Psychology: Shattering Widespread Misconceptions about Human Behavior)
- Discovering Psychology Video: Past, Present and Promise (26:37) (Given the length of this video, may be more appropriate as an out of class or online activity.) http://www.learner.org/vod/vod_window.html?pid=1498

Links to ToPIX Materials

Activities, demonstrations, handouts, etc.:
http://topix.teachpsych.org/w/page/19981004/History%20in%20the%20Classroom

Books & Films:
http://topix.teachpsych.org/w/page/39234838/History

Current events/ news:
http://topix.teachpsych.org/w/page/24891589/History%20in%20the%20News

Video/audio:
http://topix.teachpsych.org/w/page/19981003/History%20Videos

Teaching Topics

Teaching The Most Important Course
http://nobaproject.com/documents/1_Teaching_The_Most_Important_Course.pdf

Content Coverage
http://nobaproject.com/documents/2_Content_Coverage.pdf

Motivating Students
http://nobaproject.com/documents/3_Motivating_Students_Tips.pdf

Engaging Large Classes
http://nobaproject.com/documents/4_Engaging_Large_Classes.pdf

Assessment Learning
http://nobaproject.com/documents/5_Assessment_Learning.pdf

Teaching Biological Psychology
http://nobaproject.com/documents/6_Teaching_Bio_Psych.pdf

PowerPoint Presentation

This module has an associated PowerPoint presentation. Download it at http://nobaproject.com//images/shared/supplement_editions/000/000/151/Why%20Science-.ppt?1447976738.

About Noba

The Diener Education Fund (DEF) is a non-profit organization founded with the mission of re-inventing higher education to serve the changing needs of students and professors. The initial focus of the DEF is on making information, especially of the type found in textbooks, widely available to people of all backgrounds. This mission is embodied in the Noba project.

Noba is an open and free online platform that provides high-quality, flexibly structured textbooks and educational materials. The goals of Noba are three-fold:

- To reduce financial burden on students by providing access to free educational content
- To provide instructors with a platform to customize educational content to better suit their curriculum
- To present material written by a collection of experts and authorities in the field

The Diener Education Fund is co-founded by Drs. Ed and Carol Diener. Ed is the Joseph Smiley Distinguished Professor of Psychology (Emeritus) at the University of Illinois. Carol Diener is the former director of the Mental Health Worker and the Juvenile Justice Programs at the University of Illinois. Both Ed and Carol are award- winning university teachers.

Acknowledgements

The Diener Education Fund would like to acknowledge the following individuals and companies for their contribution to the Noba Project: The staff of Positive Acorn, including Robert Biswas-Diener as managing editor and Peter Lindberg as Project Manager; The Other Firm for user experience design and web development; Sockeye Creative for their work on brand and identity development; Arthur Mount for illustrations; Chad Hurst for photography; EEI Communications for manuscript proofreading; Marissa Diener, Shigehiro Oishi, Daniel Simons, Robert Levine, Lorin Lachs and Thomas Sander for their feedback and suggestions in the early stages of the project.

Copyright

R. Biswas-Diener & E. Diener (Eds), Noba Textbook Series: Psychology. Champaign, IL: DEF Publishers. DOI: nobaproject.com

The Internet addresses listed in the text were accurate at the time of publication. The inclusion of a Website does not indicate an endorsement by the authors or the Diener Education Fund, and the Diener Education Fund does not guarantee the accuracy of the information presented at these sites.

Contact Information:

Noba Project
2100 SE Lake Rd., Suite 5
Milwaukie, OR 97222
www.nobaproject.com
info@nobaproject.com