

THERAPEUTIC TOUCH: An Inquiry

Adapted from Scientific American Frontiers Teaching Guide:

A Different Way to Heal? A Biased View

Nature of Science: Social Context: Bias

SYNOPSIS

Students experience bias by testing the idea that we have an “aura” by which others can sense our presence. This is done by holding a hand about 15 cm (6 in.) above one or the other of another person’s outstretched hands (randomly selected), and that person reports if there is any sensation experienced in that hand. This is done 15 times with the subject’s eyes open, then 15 times with the subject blindfolded. By comparing and discussing results, students come to recognize the **placebo effect** (a kind of **confirmation bias**), and the value of a “blind” experiment to test this effect. They also see how the “Therapeutic Touch” idea is an example of a **pseudoscience**.

PRINCIPAL CONCEPTS

1. Understanding science enables one to differentiate it from pseudoscience and non-science.
2. Science is essentially a process of critical and skeptical thinking.

ASSOCIATED CONCEPTS

1. Confirmation bias can influence observations.
2. The placebo effect is a type of confirmation bias.
3. Therapeutic Touch is an example of a pseudoscience.

ASSESSABLE OBJECTIVES (Students will...)

1. Students will recognize when personal judgment can influence observations.
2. Given a description of an experiment or planned observation, students will recognize if judgment is involved in obtaining the results.
3. Students will recognize when bias has possibly played a role in the observations made.

MATERIALS

Clean blindfold
Tissue (like Kleenex), fresh for each subject
Journal (to record data)
Coin to flip easily, OR a die to roll in a box or tray

Before starting the study, students set up a **data table** in their journal, to record results of 15 trials with subject’s eyes open, then 15 trials with subject blindfolded.

TIME: Data gathered outside of class, results shared and discussed in class. 1 class period.

STUDENT HANDOUT

Therapeutic Touch (Background, Materials, Procedure and Questions): 2 pages back to back.

TEACHING STRATEGIES & PREPARATION

1. This lesson was developed for grades 5-8. It is intended for individual students to do the study with family and/or friends (who are not in the class), but you may want them to form teams of 2-5, where at least 2-3 students do the study, then discuss results (and questions) with team mates. Team consensus can then be discussed in teacher-guided class discussion with other teams.

2. The **placebo effect** is a variation on **confirmation bias**, where one's expectations and beliefs influence the experimental results. This is especially true when the results are subjective, or involve some judgment or opinion. This lesson provides a vivid experience with this kind of bias.

3. You may want to show the 5'30" video segment called *Stossel: Testing Therapeutic Touch* <http://www.youtube.com/watch?v=mNoRxCRJ-Y0> It shows some practitioners, and then a 9 year old girl (Emily Rosa) who's research on TT was published in the *Journal of the American Medical Association (JAMA)* in April of 1998. You probably should do this before handing out the assignment. An interesting variation would be to show the video after they have done the experiment and discussed it in class. OR, show to half of your classes *before* they do the study, and the rest *after* they do the study (to see if conceptual bias played a role in their studies).

4. Read "**Therapeutic Touch**" (Student Handout). If you have enough dice, you might find there is less commotion (due to dropped coins rolling on the floor) if you have students roll a die into a box (or shake in a padded dice-shaker tube with a lid). With the die, odd numbers (1,3,5) would mean "left hand" and even numbers (2,4,6) would mean "right hand."

5. **Demonstrations:** If your students need this instruction, you may want to show them how to prepare the table for recording the results of 15 trials with eyes open and 15 trials with eyes blindfolded. Also, demonstrate how the subject can hold a pad of tissue over each closed eye, while the experimenter places a blindfold over the tissues, and ties it behind the subject's head. Each subject must use fresh tissues (for hygienic reasons). Students can use a neckerchief or thin towel for a blindfold.

OTHER RESOURCES, ANSWERS to the Questions, and **STANDARDS** met by this lesson: See below.

PROCEDURES

See Procedures on Student Handout

ASSESSMENT

See Assessable Objectives for focus of assessment.

EXTENSIONS & VARIATIONS

Possible Alternative or Supplemental Articles: 1) **Confirmation Bias in Science** (click on title to see it).

Here is an interesting article that describes two examples of confirmation bias: N-Rays, and Water Memories (homeopathic remedies). This is written by a practicing scientist (physicist), who also touches on the importance of **double-blind experiments** where judgment and opinions are involved in the results.

The author also shares his own experience with a new scientific idea, how he (and his team) built a theoretical **model** of the process, spending most of their time trying to *destroy* that idea (testing it), and how it was presented to other scientists. Even so, other scientists resisted and critiqued the idea. As a result, his idea became stronger. This is an excellent example of how science is done (as told by a scientist).

This process of **critical and skeptical thinking (science)** is applied to the claims of climate-change deniers. But once those claims are clearly shown to be false, scientists move on, while the deniers choose to ignore those findings.

If you use this article, have your students answer and discuss the **Discussion Questions** that go with it. If you want the key to those 24 questions, contact the webmaster using your school email address.

2) **Women's Brains** article: This, too, deals with bias in research of measuring human brain volume. The reading level is a little higher, could be challenging. Click on that title to see complete lesson on this site.

Other Aspects of Therapeutic Touch: Public Be Aware: Are there any dangers associated with the practice of Therapeutic Touch? If so, what might they be? Are there benefits to using it? If so, what are they? Compare and contrast a belief in TT to a belief in expectations associated with prayer (be tactful here, or avoid altogether). How are they different? How are they the same? Students could just discuss this (teams, then teacher-guided discussion with entire class).

Another Pseudoscience: Magnetic Therapy: Have you ever seen print articles or television commercials about the healing and pain-reducing properties of magnets? These claims are not new. Since magnets were first discovered, they have attracted much attention from those seeking paranormal properties. What have you heard about magnets and healing? Compose a paragraph that describes all you currently know about magnetic therapy. Then check out the following Web page maintained by the *Committee for the Scientific Investigation of Claims of the Paranormal* - http://www.csicop.org/si/show/magnetic_healing_an_old_scam_that_never_dies. Based on the information presented in this article and information mined from other Web and print resources, write a five minute radio program that presents an unbiased view of magnetic therapy.

ATTRIBUTIONS

Lesson is adapted from the *Scientific American Frontiers* lesson at <http://www.pbs.org/saf/1210/teaching/menu.htm>

Select Activity: "A Biased View," click on the PDF icon for print version

Adapted for ENSI site by Larry Flammer. 28 November, 2012.

OTHER RESOURCES

WEB CONNECTIONS

Nurse Healers - Professional Associates International <http://therapeutic-touch.org/2012/04/dolores-kriegers-website-is-up-and-running/> □ The official Web site for Therapeutic Touch.

Skeptical Information Sources

Quack Watch: <http://www.quackwatch.com/05Links/skepticsites.html> This site offers links to various agencies that provide accurate and practical information concerning a wide range of paranormal claims.

The Skeptic's Dictionary: Therapeutic Touch

<http://www.skepdic.com/tt.html> An introduction to **control group study**, **double-blind** and **random tests**.

American Cancer Society

<http://www.cancer.org/treatment/treatmentsandsideeffects/complementaryandalternativemedicine/manualhealingandphysicaltouch/therapeutic-touch>

Why Therapeutic Touch Should be Considered Quackery

<http://www.quackwatch.com/01QuackeryRelatedTopics/tt.html>

Video: Stossel Testing Therapeutic Touch

<http://www.youtube.com/watch?v=mNoRxCRJ-Y0>

Includes practitioners, and 9 year old girl (Emily Rosa) who's research on TT was published in the Journal of the American Medical Association (JAMA) in 1989.

What alternative health practitioners might not tell you

<http://www.ebm-first.com/therapeutic-touch-tt.html>

ANSWERS TO QUESTIONS

1. How was the bias produced in this activity? □(The bias was generated by the deceitful description of the sixth sense. By telling the individuals that a human energy field really existed, they may have come to believe that they were able to detect such a field. It was strictly their belief that gave them this ability - a belief that was further reinforced by the visual clues they received.)

2. Did your subjects demonstrate a bias? If so, how? □ (Answers will vary, but many people will concur that they did detect the "energy field," especially when your hand was not there in the second part.)

3. Why was it important to keep your hand at least several inches above the subject's hand? □(To avoid creating air currents that might be detected by the sense of touch, or by heat from the hand.

4. Why was a blindfold used in the second part of this activity? (The blindfold ruled out the visual clues.)

5. Did your subject's ability to "detect" the energy field change when blindfolded? In what way? □(Most likely, subjects were less accurate in detecting the energy field once they were no longer getting the visual clues, revealing the subject's unconscious connection between what they see and what they feel.

NATIONAL SCIENCE STANDARDS (1997, Grades 5-8) satisfied by this lesson:

Science as Inquiry – Content Standard A

Students will establish whether or not a cause and effect relationship exists based on critical thinking and observation.

History and Science – Content Standard G

Students will learn that the newest areas of scientific research many times lack experimental evidence and understanding

Students will understand that disagreement does exist in the scientific community.

NEW NATIONAL SCIENCE STANDARDS (NGSS, 2013)

New National Standards (NGSS Appendix H: Nature of Science) Matrices, pp.5-6 Learning Objectives for 8 Basic Understandings/Categories/Themes, using or implying these terms: Critical, Testing, Skeptical, Natural:

High School: 1c, 2a, 2b, 3c, 4e, 5c, 6a, 7c, 8a

Middle School: 1d, 7c, 8b

Grades 3-5: 4a, 4b, 8b