Teaching Psychology Students to Distinguish Science from Pseudoscience:
Pitfalls and Rewards

PsychTeacher Electronic Discussion List

Teaching Critical Thinking

The Warning Signs of Pseudoscience
Pseudoscience as a Useful Didactic Tool
After all, for many beginning students, “psychology” is virtually synonymous with popular psychology. But because so much of popular psychology consists of myths and urban legends (e.g., most people use only 10% of their brains, expressing anger is usually better than holding it in, opposites attract in interpersonal relationships, high self-esteem is necessary for psychological health, schizophrenics have more than one personality), many students probably emerge from psychology courses with the same misconceptions with which they entered. Finally, in our admittedly anecdotal experience, students often find controversial topics on the fringes of scientific knowledge (e.g., ESP, astrology, subliminal persuasion, hypnosis...).
availability, and anchoring (Tversky & Kahneman, 1974), are generally adaptive and help us make sense of a confusing world. Hence, most pseudoscientific beliefs are torn from the same cloth as accurate beliefs.

Fourth, instructors must expose students to both poles of the pseudoscience construct (see Kelly, 1955). Thus, in our classes, it is important not merely to debunk inaccurate claims, but to make students aware of accurate claims. In my own advanced undergraduate seminar, Science and Pseudoscience in Psychology, I have found it helpful to intersperse pseudoscientific material with material that is equally remarkable but true, such as eidetic imagery, subliminal perception (as opposed to subliminal persuasion, which is far more scientifically dubious), and appropriate clinical uses of hypnosis (as opposed to the scientifically unsupported use of hypnosis for memory recovery; see Lynn, Lock, Myers, & Payne, 1997). In addition, it is useful to bear in mind the late Stephen Jay Gould's point that exposing a falsehood necessarily affirms a truth. As a consequence, it is essential not only to point out false information to students, but to direct them to true information. For example, when explaining why claims regarding biorhythms are baseless (see Hines, 2003), it is helpful to introduce students to claims regarding circadian rhythms, which, although often confused with biorhythms, are supported by rigorous scientific research.

Fifth, and perhaps most controversially, I believe that instructors must distinguish pseudoscientific claims from religious claims that are metaphysical. Unlike pseudoscientific claims, metaphysical claims (Popper, 1959) cannot be tested empirically and therefore lie outside the boundaries of science. In the domain of religion, these include claims regarding the existence of God, the soul, and the afterlife, none of which can be refuted by any conceivable body of scientific evidence. Nevertheless, certain religious or quasi-religious beliefs, such as those involving "intelligent design" theory, which is the newest incarnation of creationism (see Miller, 2000), the Shroud of Turin, and weeping statues of Mother Mary, are indeed testable and hence suitable for critical analysis alongside other questionable naturalistic beliefs. But by confusing pseudoscientific beliefs with religious beliefs that are metaphysical, instructors risk (a) needlessly alienating a sizeable proportion of their students, many of whom may be deeply religious; and (b) (paradoxically) undermining students' critical thinking skills, which require a clear understanding of the difference between testable and untestable claims.

The Rewards of Teaching Students about Pseudoscience

Informally, a number of students who have taken my Science and Pseudoscience seminar have told me that this course fundamentally changed their thinking and persuaded them of the value of open-minded skepticism when considering knowledge claims. Needless to say, such feedback is immensely gratifying. But as I have already noted, anecdotal evidence has its limitations. Fortunately, some research evidence supports the efficacy of teaching psychology courses on pseudoscience. For example, Morier and Keeports (1994) found that students enrolled in an undergraduate "Science and Pseudoscience" seminar demonstrated a statistically significant reduction in
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