

Confronting Psychological Misconceptions in the Classroom: Challenges and Rewards

By **Scott O. Lilienfeld**

DISPONIBLE EN ESPAÑOL



Lilienfeld

"But, Dr. Jones, I'd always heard that opposites attract. Isn't that true?"

"Dr. Smith, yesterday I heard my political science professor talk about the American people's schizophrenic attitude toward abortion. So doesn't that mean that schizophrenics really do have multiple personalities?"

"Dr. Allen, my therapist told me that I need to express my anger to get rid of it. So hitting a pillow when I get mad will make me feel better, right?"

Anyone who has taught an introductory psychology course has surely heard these kinds of questions from students. That is hardly surprising, because survey data show that many psychological misconceptions — like those exemplified by such questions — are widespread among undergraduates (Lilienfeld, Lynn, Ruscio, & Beyerstein, 2009).

Philosopher of science Sir Karl Popper (1963) argued that "science must begin with myths, and with the criticism of myths" (p. 50). My contention in this column is that psychology instructors should similarly make misconceptions a starting point in their teaching by disabusing students of inaccurate information before presenting them with accurate information (Lilienfeld, Lynn, Namy, & Wolff, 2009). That is, psychology teachers should recognize the wisdom of Mark Twain's maxim that education consists at least as much of *unlearning* incorrect knowledge as learning correct knowledge.

Some instructors may be reluctant to introduce psychology students to misconceptions out of concerns that doing so will (1) leave students confused about the differences between psychological facts and fictions, and (2) take time away from important subject matter, or both. Although such risks are not groundless, I contend that neglecting psychological misconceptions carries even greater risks (see also Chew, 2004). Specifically, research demonstrates that when psychology instructors neglect to teach their students about misconceptions, many students will leave their classes with such misconceptions intact (Lilienfeld, Lynn, Beyerstein, & Ruscio, 2009).

Psychological Misconceptions: What Are They and Why Do They Matter?

As science educator David Hammer (1996) noted, scientific misconceptions, including those in psychology, share four major characteristics: (1) they are relatively enduring and deeply entrenched beliefs, (2) they are contradicted by well established scientific evidence, (3) they influence how people conceptualize the world, and (4) they need to be rectified for people to achieve accurate knowledge about the world. The final point is perhaps most critical for our purposes, because many psychological misconceptions can impede the acquisition of correct knowledge. As Gottfredson (2009) observed, "students do not come to academic subjects as blank slates but often with basic misconceptions that create barriers to learning unless the teacher takes them into account" (p. 58). For example, a student who believes erroneously that any improvement in a psychotherapy client over time must be due to the effects of the treatment — an example of the *post hoc ergo propter hoc* (after this, therefore because of this) fallacy — will probably find it difficult to appreciate the need for randomized control groups in psychotherapy outcome research. Moreover, some psychological misconceptions may be harmful. Students who believe erroneously that opposites attract in romantic relationships may search in vain for a life partner who complements their personality traits, and students who believe erroneously that only clinically depressed people attempt suicide may respond cavalierly to the threats of a suicidal classmate who is hopeless, but not deeply sad.

The Prevalence of Psychological Misconceptions Among Students

Some researchers have maintained that psychological misconceptions are relatively rare among college students. After surveying a sample of 219 undergraduates, Brown (1983) concluded that "many of the misconceptions that teachers suspect are widely shared are in fact rejected by the majority of students. And when student knowledge of psychology in general is examined, it turns out that widely shared misconceptions are rare indeed" (p. 209). Nevertheless, Brown relied on a relatively stringent cut-off for regarding a belief as a misconception, namely, a belief that is held by 50% or more of students.

Other data show that many clear-cut psychological misconceptions are in fact widespread among students in psychology courses (Della Salla, 1999; 2007; Lilienfeld et al., in press; Mercer, 2010). For example, consider the following psychological misconceptions examined across various studies, followed by the percentages of North American undergraduates found to hold them:

- Opposites tend to attract in interpersonal relationships (77%) (McCutcheon, 1991).
- Most elderly people are lonely and isolated (65%) (Panek, 1982)
- Expressing pent-up anger reduces aggression (66%) (Brown, 1983)
- Hypnotically enhanced memories are especially accurate (35%) (Brown et al., 1997)
- Memory operates like a tape recorder (27%) (Lenz, Ek, & Mills, 2009)
- The polygraph test is an accurate detector of lies (45%) (Taylor & Kowalski, 2003)
- Schizophrenics have multiple personalities (77%) (Vaughn, 1977)
- The primary feature of Tourette's disorder is cursing (65%) (Taylor & Kowalski, 2003)

Relatively recent research suggests that students often hold inaccurate psychological beliefs with greater confidence than they do accurate psychological beliefs (Landau & Bavaria, 2003). If such research proves replicable, it would pose a particular challenge for psychology instructors, because psychological misconceptions may often be especially resistant to corrective education.

The Malleability of Psychological Misconceptions

This finding raises a key question: How malleable are psychological misconceptions following standard methods of instruction? The findings here are sobering — the results of several studies point to minimal change in psychological misconceptions following introductory psychology courses (e.g., Gutman, 1979; McKeachie, 1960; Vaughn, 1977). Across several studies, the average decreases in misconceptions have been on the order of 5 to 6.5%; even these percentages may be overestimates because they derive from pre-post designs, which are often vulnerable to practice effects. Moreover, research indicates that the decreases in psychological misconceptions following introductory psychology courses are lowest among D and F students, who are especially susceptible to these beliefs to begin with (Gutman, 1979). Nor does asking students where they learned about psychological misconceptions reduce belief in their correctness. Disturbingly, 38% of students reported that they acquired these beliefs through one of their psychology courses or teachers (Landau & Bavaria, 2003)!

Educational psychology research on "extramission beliefs" offers an instructive, if disconcerting, illustration. Remarkably, research using a variety of methodologies

indicates that large percentages of college students believe that tiny particles emerge from the eyes when people perceive the world (Winer, Cottrell, Greg, Fournier, & Bica, 2002). Perhaps even more remarkably, such research demonstrates that these beliefs do not decline much, if at all, following standard college lectures in sensation and perception (Gregg, Winer, Cottrell, Hedman, & Fournier, 2001), most or all of which presumably do not address extramission beliefs explicitly. If such research is generalizable to other psychological misconceptions, it again suggests that the failure to address misconceptions explicitly in coursework often leaves such misconceptions unscathed.

10 Sources of Psychological Misconceptions

Psychological misconceptions stem from a variety of sources, many of which can be helpful to address in one's teaching (Chew, 2004). Here I briefly review 10 of the most prevalent of these sources, along with one or two salient examples of each (see Lilienfeld, Lynn, Ruscio, & Beyerstein, 2009).

Word of mouth: Some psychological misconceptions are effective "memes" (Dawkins, 1976) because they are catchy, straightforward, and easily disseminated. For example, such phrases as "opposites attract" and "there's safety in numbers" are likely to "spread" from person to person in part because of their memorability. Nevertheless, both of these beliefs are largely or entirely false: Research on interpersonal attraction reveals that similars, not opposites, tend to attract in relationships (Lewak, Wakefield, & Briggs, 1985), and research on bystander intervention reveals that there is usually danger, not safety, in numbers (Latane & Nida, 1981).

Desire for easy answers and quick fixes: Some false psychological claims are appealing because they promise simple and fast solutions to otherwise intractable life problems. For example, some proponents of Thought Field Therapy, a psychotherapy that purports to treat psychological disorders by removing blockages from invisible energy fields, claim to be able to cure longstanding phobias in a matter of minutes (Gaudiano & Herbert, 2000).

Selective perception and memory: Some events are more memorable than others because they confirm our expectations. In turn, such events can give rise to "illusory correlations" (Chapman & Chapman, 1967) between these events and other variables. For example, one probable reason why many people are convinced that full moons are associated with unusual behaviors, such as crimes, suicides, and psychiatric hospital admissions, despite overwhelming evidence to the contrary (Rotton & Kelly, 1985), is that during full moons people are more likely to notice instances when something odd happens than when nothing odd happens. This "fallacy of positive instances" probably helps to account for many beliefs that run counter to research evidence, such as the claim that vaccines are associated with autism (Offitt, 2008).

Inferring causation from correlation: As every psychology teacher knows, most introductory students become adept at repeating the mantra "Correlation isn't causation," yet continue to leap to causal conclusions on the basis of correlational data. This error is understandable, especially when it is consistent with students' *a priori* views of the world. This "belief bias" — the tendency to accept conclusions, including flawed conclusions, more readily if they square with our hunches (Stanovich, 2009) — is probably a prime cause of the correlation-causation confusion. For example, because it seems plausible that being physically abused in childhood contributes to one's risk of becoming an abuser oneself (indeed, there may be some truth to this hypothesis), students may too readily assume that correlational data linking a history of early physical abuse to later aggression implies a causal association. Nevertheless, other explanations are possible; for example, parents who physically abuse their children may pass on to their children a genetic predisposition toward aggression (DiLalla & Gottesman, 1991).

Post hoc, ergo propter hoc reasoning: Similarly, it is tempting to assume that because A precedes B, A must cause B. Nevertheless, this "post hoc, ergo propter hoc" reasoning is logically flawed. For example, "blowing off steam" when we become angry is often followed by an immediate reduction in anger, but in many cases that is only because anger is usually short-lived. This phenomenon can lead us to conclude that expressing anger reduces its intensity; to the contrary, most research demonstrates that doing has no effect on anger or exacerbates it (Lohr, Olatunji, Baumeister, & Bushman, 2007).

Exposure to biased samples: In many cases, we are routinely exposed to biased samples as a function of our occupations, vocations, and the like. For example, by virtue of their profession, psychotherapists tend to see clients who relapse repeatedly rather than recover. As a consequence, they may fall prey to the misperception that few, if any, people with alcoholism recover on their own; in fact, data indicate that substantial percentages of people with alcoholism become abstinent without treatment (Sobell, Ellingstad, & Sobell, 2000). This finding illustrates the "clinician's illusion" (Cohen & Cohen, 1984): the tendency for practitioners to overestimate the chronicity of psychological problems.

Reasoning by representativeness: In daily life, we frequently gauge the similarity between two objects or events using the representativeness heuristic (a heuristic is a mental short-cut or rule of thumb); according to this heuristic, "like goes with like." In many cases, reliance on representativeness results in accurate conclusions, but it can lead us astray if applied uncritically. According to advocates of astrology, people born under certain animal or object "signs" tend to display the personality characteristics supposedly associated with these signs (Hines, 2003). For example, people born under the sign of Taurus (the bull) are ostensibly stubborn and strong-willed, whereas people born under the sign of Libra (the scales) are ostensibly balanced and even-keeled.

Misleading film and media portrayals: The media bombard us with skewed portrayals of the prevalence of certain characteristics in the population, fueling widespread misconceptions. For example, films depict approximately 75% of mentally ill individuals as violent (Wahl, 1997). Perhaps not surprisingly, most Americans strongly associate mental illness with physical aggression (Ganguli, 2000). Yet controlled studies show that 90% or more of people with serious mental illnesses never commit violence (Hodgins et al., 1996), and the heightened risk of violence among the mentally ill appears limited to individuals with substance abuse or dependence and perhaps paranoid delusions (Elbogen & Johnson, 2009).

Exaggeration of a kernel of truth: Some psychological misconceptions probably contain a small kernel of truth. Pop psychologist John Gray (1992) has long maintained that men and women are so different in their communication styles that they are virtually from different planets (Mars and Venus, respectively). Data indeed show that men and women often communicate in different ways; for example, men tend to interrupt others more often than do women, and women tend to be more self-disclosing than men. Nevertheless, the magnitudes of these and other sex differences in communication tend to be small (Hyde, 2005), and the overlap between men and women in their communication styles is far greater than implied by Gray.

Terminological confusion: Certain psychological misconceptions probably stem from confusion regarding the meanings of technical terms. When Swiss psychiatrist Eugen Bleuler (1911) coined the term "schizophrenia," meaning "split mind," in the early 20th century, he meant it to refer to the fractionation of mental functions, like emotion, thinking, and will, within personalities. Nevertheless, perhaps beginning with G. Stanley Hall (the first president of the American Psychological Association) in 1916 (McNally, 2007), many people have confused schizophrenia with dissociative identity disorder (DID), formerly called multiple personality disorder. In all likelihood, Hall and others misinterpreted Bleuler's term as implying the co-existence of several personalities or personality fragments within one mind, which supposedly characterizes DID (but see Lilienfeld & Lynn, 2003).

Challenges and Rewards of Debunking Psychological Misconceptions

Debunking psychological misconceptions in the classroom is not without risks. Research by Norbert Schwarz and his colleagues (Schwarz, Sanna, Skurnik, & Yoon, 2007) suggests that informing participants that an assertion, such as "The side effects of a flu vaccine are often worse than the flu itself," is incorrect can sometimes backfire, resulting in increases in this misconception. Most likely, participants later recall the statement itself, but forget its "negation tag," the yellow sticky note in their heads that reminds them that "this claim is wrong." Schwarz' work suggests that merely informing students that certain claims are incorrect is often insufficient to disabuse them of misconceptions. Instead, presenting research evidence to the contrary, and explaining *why* this belief is wrong by linking it up with background conceptual knowledge, may be necessary.

Indeed, there are cautious grounds for optimism. Research on extramission beliefs, discussed earlier, reveals that an "activation" approach — in which instructors

explicitly introduce students to misconceptions and then refute them with scientific evidence — can significantly reduce levels of false beliefs (Winer et al., 2002). Moreover, recent research suggests that explicitly raising and refuting psychological misconceptions in lectures, readings, or both can produce large — 50% or more — decreases in the levels of these misconceptions among undergraduates (Kowalski & Taylor, 2009). Note that this approach requires instructors to teach their students not merely about what is true or well supported, but also what is false and poorly supported.

In my undergraduate classes, I have similarly found an activation approach to be helpful in dispelling students' misconceptions. When introducing a topic, I typically begin by discussing popular misconceptions and may even survey my own students about such misconceptions by asking for a show of hands. I then use these misconceptions as didactic vehicles or "hooks" for imparting accurate information. For example, when lecturing on memory in my introductory psychology course, I first present students with widespread false beliefs about memory — such as the belief that memory operates like a videotape, or that our brains record the exact memories of everything we have experienced — and dispel these beliefs while providing students with accurate information about memory. In doing so, I often discuss the probable origins of each misconception by drawing on one or more of the 10 sources presented earlier. For example, when discussing the myth that our memories provide infallible records of our experiences, I may offer examples of television shows, such as *CSI*, that sometimes treat eyewitness memory as essentially perfect.

By adopting this approach, I find that students achieve greater conceptual understanding, because they come to appreciate why their intuitively plausible beliefs are mistaken. In essence, they come away from their classes thinking, "I once believed this and understand why it seemed correct at the time, but now I understand why it's wrong." In my admittedly anecdotal experience, students find this "comparative approach" to teaching, in which inaccurate or questionable information is continually compared with accurate information, to be engaging and helpful in fostering depth of processing.

When addressing psychological misconceptions in my classes, I routinely emphasize that these false beliefs are prevalent and psychologically understandable. Indeed, I sometimes tell my students that I once held a specific misconception myself; for instance, in my undergraduate years I assumed (erroneously) that intelligence tests are strongly biased against certain groups of individuals. I use this "normalization" approach to avoid making students feel foolish and to underscore the point that many misconceptions stem from psychological processes, such as heuristics, that are generally adaptive but that can mislead us in specific circumstances. On a related note, I frequently remind my students that many misconceptions seem subjectively compelling: They just "feel right" because they dovetail with our hunches. Yet as I also remind them, psychological science often requires us to mistrust our common sense and set aside our intuitions.

The research I have reviewed demonstrates that instructors ignore students' psychological misconceptions at their peril. If teachers do not address their students' false beliefs explicitly, students will leave their classes with many of these beliefs intact. At the same time, this research gives us reason for hope. It suggests that instructors can reap substantial rewards in their teaching by bringing student misconceptions "out of the shadows," elucidating their psychological origins, and counteracting them with accurate information.

Scott O. Lilienfeld

is Professor of Psychology at Emory University in Atlanta. He received his BA in Psychology at Cornell University, his PhD from the University of Minnesota, and completed his clinical internship at Western Psychiatric Institute and Clinics in Pittsburgh. He is past president of the Society for a Science of Clinical Psychology and editor of *Scientific Review of Mental Health Practice*. His research interests include personality disorders, psychiatric classification, and scientific thinking in psychology. Along with Steven Jay Lynn, John Ruscio, and the late Barry Beyerstein, he is co-author of *50 Great Myths of Popular Psychology: Shattering Widespread Misconceptions about Human Behavior* (2010, Wiley-Blackwell).

References and Further Reading:

- Bleuler, E. (1911). *Dementia praecox or the group of schizophrenias* (J. Zinkin, Trans.). New York: International Universities Press.
- Brown, L.T. (1983). Some more misconceptions about psychology among introductory psychology students. *Teaching of Psychology*, 10, 207-210.
- Chapman, L.J., & Chapman, J.P. (1967). Genesis of popular but erroneous diagnostic observations. *Journal of Abnormal Psychology*, 72, 193-204.
- Chew, S.L. (2004, March). Student misconceptions in the psychology classroom. In B.K. Saville, T.E. Zinn, & V.W. Hevern (Eds.), *E-xcellence in Teaching 2004* (Vol. 4, pp. 11-15). Retrieved from <http://teachpsych.lemoyne.edu/teachpsych/eit/eit2004/index.html>
- Cohen, P., & Cohen, J. (1984). The clinician's illusion. *Archives of General Psychiatry*, 41, 1178-1182.
- Dawkins, R. (1976). *The selfish gene*. Oxford, England: Oxford University Press.
- Della Sala, S. (Ed.). (1999). *Mind myths: Exploring popular assumptions about the mind and brain*. Chichester, England: Wiley.
- Della Sala, S. (Ed.). (2007). *Tall tales about the mind and brain*. Oxford, England: Oxford University Press.
- DiLalla, L.F., & Gottesman, I.I. (1991). Biological and genetic contributors to violence: Widom's untold tale. *Psychological Bulletin*, 109, 125-129.
- Elbogen, E.B., & Johnson, S.C. (2009). The intricate link between violence and mental disorder: Results from the National Epidemiological Survey on Alcohol and Related Conditions. *Archives of General Psychiatry*, 66, 152-161.
- Ganguli, R. (2000, March 18). Mental illness and misconceptions. *Pittsburgh Post-Gazette*. Retrieved May 12, 2008, from <http://www.post-gazette.com/forum/20000318gang1.asp>
- Gaudio, B.A., & Herbert, J.D. (2000). Can we really tap our problems away: A critical analysis of Thought Field Therapy. *Skeptical Inquirer*, 24, 29-33, 36.
- Gray, J. (1992). *Men are from Mars, women are from Venus: A practical guide for improving communication and getting what you want in your relationships*. New York: HarperCollins.
- Gregg, V. R., Winer, G. A., Cottrell, J. E., Hedman, K. E., & Fournier, J. S. (2001). The persistence of a misconception about vision after educational interventions. *Psychonomic Bulletin & Review*, 8, 622-626.
- Hammer, D. (1996). More than misconceptions: Multiple perspectives on student knowledge and reasoning, and an appropriate role for education research. *American Journal of Physics*, 64, 1316-1325.
- Hines, T. (2003). *Pseudoscience and the paranormal* (2nd ed.). Amherst, New York: Prometheus Books.
- Hodgins, S., Mednick, S., Brennan, P.A., Schulsinger, F., & Engberg, M. (1996). Mental disorder and crime. Evidence from a Danish birth cohort. *Archives of General Psychiatry*, 53, 489-496.
- Hyde, J.S. (2005). The gender similarities hypothesis. *American Psychologist*, 60, 581-592.
- Kowalski, P., & Taylor, A.K. (2009). The effect of refuting misconceptions in the introductory psychology class. *Teaching of Psychology*, 36, 153-159.
- Latane, B., & Nida, S. (1981). Ten years of research on group size and helping. *Psychological Bulletin*, 89, 308-324.
- Lenz, M.A., Ek, K., & Mills, A.C. (2009, March 26). Misconceptions in psychology. Presentation at the 4th Midwest Conference on Professional Psychology, Owatonna, MN.
- Lewak, R.W., Wakefield, J.A., Jr., & Briggs, P.F. (1985). Intelligence and personality in mate choice and marital satisfaction. *Personality and Individual Differences*, 4, 471-477.
- Lilienfeld, S.O., & Lynn, S.J. (2003). Dissociative identity disorder: Multiple personalities, multiple controversies. In S.O. Lilienfeld, S.J. Lynn, & J.M. Lohr (Eds.), *Science and pseudoscience in clinical psychology* (pp. 109-142). New York: Guilford.
- Lilienfeld, S.O., Lynn, S.J., Namy, L., & Woolf, N. (2009). *Psychology: From inquiry to understanding*. Boston, MA: Allyn & Bacon.
- Lilienfeld, S.O., Lynn, S.J., Ruscio, J., & Beyerstein, B.L. (2009). *Fifty great myths of popular psychology: Shattering widespread misconceptions about human behavior*. Chichester, England: Wiley-Blackwell.
- Lohr, J. M., Olatunji, B. O., Baumeister, R. F., & Bushman, B. J. (2007). The pseudopsychology of anger venting and empirically supported alternatives that do no harm.

- Scientific Review of Mental Health Practice, 5, 54-65.
- McCutcheon, L. E. (1991). A new test of misconceptions about psychology. *Psychological Reports*, 68, 647-653.
- McNally, K. (2007). Schizophrenia as split personality/Jekyll and Hyde: The origins of the informal usage in the English language. *Journal of the History of the Behavioral Sciences*, 43, 69-79.
- Mercer, J. (2010). *Child development: Myths and misunderstandings*. New York: Sage.
- Offit, P.A. (2008). *Autism's false prophets: Bad science, risky medicine, and the search for a cure*. New York: Columbia University Press.
- Popper, K.R. (1963). *Conjectures and refutations*. London: Routledge and Keagan Paul.
- Rotton, J., & Kelly, I.W. (1985). Much ado about the full moon: A meta-analysis of lunar-lunacy research. *Psychological Bulletin*, 97, 286-306.
- Schwarz, N., Sanna, L., Skurnik, I., & Yoon, C. (2007). Metacognitive experiences and the intricacies of setting people straight: Implications for debiasing and public information campaigns. *Advances in Experimental Social Psychology*, 39, 127-161.
- Sobell, L. C., Ellingstad, T. P., & Sobell, M. B. (2000). Natural recovery from alcohol and drug problems: Methodological review of the research with suggestions for future directions. *Addiction*, 95, 749-764.
- Stanovich, K. (2009). *What intelligence tests miss: The psychology of rational thought*. New Haven, CT: Yale University Press.
- Vaughan, E.D. (1977). Misconceptions about psychology among introductory psychology students. *Teaching of Psychology*, 4, 138-141.
- Wahl, O.F. (1997). *Media madness: Public images of mental illness*. New Brunswick, NJ: Rutgers University Press.
- Winer, G.A., Cottrell, J.E., Gregg, V.R., Fournier, J.S., & Bica, L.A. (2002). Fundamentally misunderstanding visual perception: Adults' belief in visual emissions. *American Psychologist*, 57, 417-424.
- Yerkes, R.M., & Dodson, J.D. (1908). The relation of strength of stimulus to rapidity of habit-formation. *Journal of Comparative Neurology and Psychology*, 18, 459-482.

Observer Vol.23, No.7 September, 2010

Tags: Higher Education, Students, Teaching

Copyright © Association for Psychological Science