

After Introductory Psychology: The Next Course Preparing Psychology Freshmen and Sophomores for Undergraduate Research¹

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The Problem: Students' Misconception of Psychology as a Science

In *How to Think Straight about Psychology*, Stanovich (2007) bemoans psychology's image problem that stems from the way psychology is depicted in the popular culture. Between the rows upon rows of ineffective self help books, to almost 2 million parapsychology web sites² and media figures like Dr. Laura and Dr. Phil representing the discipline, it is hard to see how anyone can hold a view of psychology as anything but a frivolous pseudoscience. Faculty members teaching undergraduate psychology courses bear the challenge helping psychology students' overcome their conceptual confusion about the nature and foundation of the discipline. It is psychology faculty's obligation to teach not only the discipline's theories and findings, but its scientific foundation as well (Friedrich, 1996; Shaffer, 1977). As Charles L. Brewer (1993, p. 169) noted in discussing the undergraduate psychology curriculum, "The fundamental goal of education in psychology, from which all other others follow, is to teach students to think as scientists about behavior."

The unscientific image of the discipline is difficult to shake in even the best students not simply because of the tremendous impact of media and popular culture, but also because of students' own implicit theories (Amsel, Frost, Johnston, submitted; Stanovich, 2007). These implicit theories, often called folk theories (D'Andrade, 1987; Premack & Woodruff, 1978; Wimmer & Perner, 1983), have a core set of explanatory concepts and causal mechanisms that are antithetical to viewing any inquiry into mind as a rigorous science. In the words of the philosopher Daniel Dennett (1971), folk psychology is based on *intentional explanations* (i.e., explaining the behavior of a system by appeal to its beliefs and desires) that are convenient and even

effective, but not terribly rigorous or scientific accounts of behavior. This perception is in contrast to scientific psychology, which is decidedly rigorous and scientific. Again in the language of Dennett (1971), scientific psychology encompasses *design explanations* (i.e., explaining the behavior of a system by its functions) and *physical explanations* (i.e., explaining behavior by laws governing a system's internal composition).

The unscientific image of the discipline and students' own unscientific folk psychological beliefs conspire to create deep misunderstandings about psychology as a science among the general population, including those taking introductory psychology. Introductory Psychology students score lower than students who have completed an advanced psychology Methods class on a questionnaire assessing psychology as a science (Friedrich, 1996). Among the detrimental consequences of this misunderstanding is that psychology students fail to involve themselves in research because they fail to see its value. This lack of involvement is a critical loss of opportunity as there is good evidence that carefully scaffolded research experiences promote student academic success (Kardash, 2000; Kuh, Kinzie, Schuh, Whitt, & Associates, 2005) and grasp of the discipline as scientific (Friedrich, 1996).

Our experience at Weber State University³ is that psychology majors tend to complete the required Statistics and Methods course sequence as seniors, rather than as juniors or even sophomores. Whereas there are a number of reasons for this⁴, one of the more frequent we hear is the traditional psychology student's lament: *I cannot see why I really have to take "science courses" as I want to be a therapist.* It is now clear that this very familiar complaint goes beyond a mere lack of knowledge. Rather, it reflects a deep misunderstanding of the discipline that costs students the opportunity to effectively prepare for a career in psychology or an aligned discipline.

The Solution: Developing The Science and Profession of Psychology

While still encouraging students to begin the course sequence of Psychological Statistics and Research Methodology earlier in their academic career, we rejected *requiring* students take the courses as sophomores. The department had to respect the challenge posed to our students by Weber State University's quantitative literacy requirement (see note 3). Also, the department recognized that repeated exposure to foundational disciplinary concepts in lower and upper division courses could only be helpful in challenging students' misconceptions. So we created a new lower-division course, titled *The Science and Profession of Psychology*. The course is a strongly recommended elective to be taken by students after Introductory Psychology. The catalog description of the course reads as follows:

The purpose of this course is to build upon Introduction to Psychology so that students may better understand the discipline as both a science and a profession. The course covers a range of topics, including research, statistics, ethics, career options, graduate school options and preparation, critical to all fields of psychology and provides the skills necessary for students to succeed in upper-division courses and career preparation. This course is designed for students who are interested in or beginning to pursue psychology as an academic major or minor.

We justified the course to the university curriculum committee by reference to the department assessment research, which has demonstrated that most students grasp the scientific foundation of psychology only as juniors and seniors (Amsel, Frost, & Johnston, submitted; Amsel & Kay, in preparation). Our evidence is consistent with other studies showing the significant influence of taking advanced classes, like Psychology Statistics and Research Methods, on students' reasoning (Lawson, 1999; Lehman, & Nisbett, 1990; Mill, Gray, & Mandel, 1994; VanderStoep, & Shaughnessy, 1997) and grasp of the science of psychology (Friedrich, 1996).

Course Details: The Goals and Curriculum of the Course

The overarching goal of The Science and Profession of Psychology (SPP) is to educate students about the relation between the science and practice of psychology. Contrary to the depth of more advanced

courses, SPP is designed as a survey of basic tenets of the science and practice of psychology. We address students' misconceptions about the discipline with: a) readings regarding the scientific nature of the discipline, b) carefully scaffolded research experiences which demonstrate how psychological claims are scientifically evaluated and professionally presented, c) deliberations about scientific and professional ethics, and d) discussions about career planning, including course selection, career management, and preparing for graduate school or a job.

The course addresses five specific goals. The first is to increase students' knowledge of psychological research. This aim may sound redundant with almost every other psychology course in which foundational statistical and methodological concepts are taught. However, our research shows that students remain unclear about precisely how statistical and methodological knowledge is relevant to the discipline. That is, although students demonstrate an understanding of differences between causal and correlational designs, they do not fully grasp that psychologists test theories using such methods. It is not until the upper division Psychological Statistics and Research Methods that students learn why and how psychology claims are scientifically evaluated. The course does not address the details of HOW to evaluate psychology claims but provides extended discussion of WHY it is done. The medium of that discussion is a very close reading of Stanovich's (2007) *How to Think Straight about Psychology*. The book is a polemic defending psychology as a science that is no different from other "hard" sciences. The book is read early in the course and provides a challenge to students' naïve beliefs about the foundation and epistemology of science as it is applied in psychology.

The second and third goals of the course are the development of critical thinking and professional writing skills. These goals are accomplished through a research project that allows students to think through the issues of data collection and write up findings in an APA style paper. The research is carefully scaffolded so that students learn foundational issues about research and specific data collection, entry, and analysis skills necessary to complete and write up the project. This research is fairly small-scaled but provides an opportunity to apply general concepts learned from the discussion of Stanovich (2007). The close scaffolding of students (as opposed to offering more autonomy to them) is based on a concern that if students are left to their own devices to design a study, they may just confirm their view of psychology as nonscientific and frivolous (Friedrich, 1995). Indeed, even the best students who are

involved in undergraduate research do not always learn the right lessons about the nature and epistemology of science unless they are carefully advised (Johnston, 2004; Roehrig, Austin, Hancock, & Slater, 2004). In the SPP course run during the fall 2006 semester, students worked together under the careful eye of the second author reviewing papers and designing a study examining the relation between time spent working at a job and GPA. Although somewhat “canned” and casual, we expected the experience would help ensure that students learn a) the critical attitude necessary for reviewing psychology research and evaluating psychology claims and b) preliminary skills for collecting, coding, entering, analyzing, and writing up scientific data.

The fourth goal is to increase students’ knowledge of research and professional ethics in psychology. Presently, these skills are addressed in depth in upper division courses. For example, *research* career and ethics information are addressed in Research Methods and Tests and Measurement whereas *professional* career and ethics information is taught in Abnormal Psychology and Introduction to Counseling Theories. Although there remains a need for such information to be delivered in sufficient depth in upper division courses, initial exposure to the wide range of scientific and professional ethical issues would help students to grasp the connection between the activities. For example, students learn that one is ethically obligated as a therapist to base one’s practice on established scientific knowledge (APA, 2002, paragraph 2.04). Similarly, they learn that researchers are supposed to monitor and take steps to minimize psychological harm (APA, 2002, paragraph 8.08 c). Moreover, many of our students work as para-professionals in half-way houses, treatment centers, and other jobs where knowledge of ethical limits of their therapeutic and research activities may empower them to avoid being exploited. This course should help students understand their own responsibilities in these settings and the professional responsibilities of their supervisors.

The final goal of the course is to increase students’ knowledge of and preparation for a career in psychology or an aligned discipline. Whereas we readily acknowledge that few students will pursue graduate work in psychology (the limited job options for BA/BS psychology students are discussed in the class), the discussion of graduate program requirements provides an important opportunity for students to understand the role of science in the practice of psychology. Indeed, the discussion

provides a “heads-up” of the kind of skills, emphasized in the course, that students are expected to acquire in the major or minor (e.g., reading primary research, SPSS skills, and APA style writing, etc.). Again, the course is not meant to replace the content of the upper-division courses; rather, it is designed to provide a survey of relevant issues and present the information in an integrated way for students to learn the connection between psychology as a science and profession. For these reasons, we are not surprised at the growth of new lower-division courses in various college and universities dedicated to introducing students to the major (Landrum, 2007).

The Future: Assessing, Updating, and Positioning the Course

The Science and Profession of Psychology has been run twice in the fall of 2006, and spring of 2007, to small groups of approximately 15 students. The enrollment was small because the class was designated as an experimental course (with a 4900 designation) that scared lower-division students away. As a result, there has been no formal assessment of the course other than course evaluations. However, the evaluations have been particularly strong, with students acknowledging that they learned more about the discipline than the thought they would. After each class, a number of students sought out research and practicum experiences prior to or concurrent with taking research methods. We plan more systematic assessment of the course for its impact on students’ understanding of psychology as a science. Until that time, The Science and Profession of Psychology will run as a strongly recommended course. We anticipate that our assessment will yield strong evidence that this course is an effective way to help students understand psychology as a science.

References

- Amsel, E., & Frost, R. B. Johnston, A. (Submitted). *Misconceptions and conceptual change in undergraduate psychology students: the case of human uniqueness.*
- Amsel, E., & Kay, T. (In preparation). *The growth of general scientific reasoning skills of psychology undergraduates.*
- APA (2002). Ethical principles of psychologists and code of conduct. Web site, <http://www.apa.org/ethics/code2002.html>, downloaded May 4, 2007.

- Brewer, C. L. (1993). Curriculum. In T. V. McGovern (Ed.), *Handbook for enhancing undergraduate education in psychology* (pp. 161-182). Washington, DC: American Psychological Association.
- D'Andrade, R. G. (1987). A folk model of the mind. In D. Holland and N. Quinn (Eds.) *Cultural models in language and thought* (pp. 112-148). Cambridge: Cambridge University Press.
- Dennett, D. (1971) Intentional systems. *Journal of Philosophy*, 68, 87-106
- Friedrich, J. (1995). *Teaching as persuasion: Altering students' views on scientific psychology*. Paper presented at the Annual Convention of the American Psychological Society, New York.
- Friedrich, J. (1996). Assessing students' perceptions of psychology as a science. Validation of a self-report measure. *Teaching of Psychology*, 23, 6-13.
- Johnston, A. (2004). *Learning the process of science: The case of undergraduate researchers and the nature of science*. Paper presented at the National Association for Research in Science Teaching, Vancouver, BC, Canada.
- Kardash, C. (2000). Evaluation of an undergraduate research experience: Perceptions of undergraduate interns and their faculty mentors. *Journal of Educational Psychology*, 92, 191-201.
- Kuh, G.D., Kinzie, J., Schuh, J.H., Whitt, E.J., & Associates. (2005). *Student success in college: Creating conditions that matter*. San Francisco: Jossey-Bass.
- Landrum, E. (2007). Summary of responses to "Orientation to the Psychology Major" email request on PSYCHTEACHER. Email received 4/11/2007.
- Lawson, T. J. (1999). Assessing psychological critical thinking as a learning outcome for psychology majors. *Teaching of Psychology* 26, 207-209.
- Lehman, D. R., & Nisbett, R. E. (1990). A longitudinal study of the effects of undergraduate training on reasoning. *Developmental Psychology*, 26, 952-960.
- Mill, D., Gray, T., & Mandel, D. R. (1994). Influence of research methods and statistics courses on everyday reasoning, critical abilities, and belief in unsubstantiated phenomena. *Canadian Journal of Behavioural Science*, 26, 246-258.
- Premack, D. G. & Woodruff, G. (1978). Does the chimpanzee have a theory of mind? *Behavioral and Brain Sciences*, 1, 515-526.
- Roehrig, G., Austin, B., Hancock, E., & Slater, T. (2004, April). *The impact of undergraduate research experiences on scientific literacy*. Paper presented at the National Association for Research in Science Teaching, Vancouver, BC, Canada.
- Shaffer, L. S. (1977). The golden fleece: Anti-intellectualism and the social science. *American Psychologist*, 40, 814-823.
- Stanovich (2007). *How to think straight about psychology*. New York: Allyn & Bacon
- VanderStoep, S.W. & Shaughnessy, J. J. (1997). Taking a course in research methods improves reasoning about real life events. *Teaching of Psychology*, 24, 122-124.
- Wimmer, H., & Perner, J. (1983). Beliefs about beliefs: Representation and constraining function of wrong beliefs in young children's understanding of deception. *Cognition*, 13, 103-128.

Notes

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² A Google search of the term *parapsychology* returned 2 million hits whereas a search of the terms "*scientific psychology*" returned 250,000 hits.

³ Weber State University is a regional university in Utah, with an overall enrollment of approximately 19,000 students. The Psychology Department has 13 faculty members, about 420 majors, and graduates approximately 100 psychology students a year. To visit, go to <http://departments.weber.edu/psychology>.

⁴ Other reasons for postponing taking the sequence until senior year include the semesters some student need to devote to completing the quantitative literacy requirement, which is a prerequisite to the Psychology Statistics and Research Methods sequence.