

# COLLEGE STUDENT PERCEPTIONS OF PSYCHOLOGY AS A SCIENCE AS A FUNCTION OF PSYCHOLOGY COURSE ENROLLMENT

TERRY F. PETTIJOHN II  
*Coastal Carolina University*

TERRY F. PETTIJOHN  
*The Ohio State University-Marion*

MIRANDA M. BRENNEMAN  
*Coastal Carolina University*

JAMIE N. GLASS  
*Coastal Carolina University*

GABRIELA R. BRITO  
*Coastal Carolina University*

ANDREW M. TERRANOVA  
*Coastal Carolina University*

JONGHAN KIM  
*Coastal Carolina University*

C.A. MEYERSBURG  
*Coastal Carolina University*

JOAN PIROCH  
*Coastal Carolina University*

## Abstract

College students ( $N = 297$ ) completed a perceptions of psychology as a science survey before and after completion of psychology courses. Psychology as a science scores increased significantly from the beginning to the end of the research methods courses, but scores in introductory psychology courses did not change and scores for students in communications psychology courses decreased. Implications for program development are discussed.

*Keywords:* college student, psychology, science, attitudes

Many psychologists consider themselves scientists and use the scientific method to conduct experiments of human behavior. However, sometimes convincing scientists in the 'hard' sciences such as biology, chemistry, and physics of the scientific merit of psychological research has been a challenge. Recently, there has been a trend for university departments to change their names and course titles from Psychology to Psychological Science, or other variations which highlight the term science. In 2006, the American Psychological Society voted to change its name to the Association for Psychological Science, thus emphasizing its scientific mission. But what do students think about the scientific nature of the field of psychology? And what factors influence these perceptions?

Perceptions of psychology as a science (PAS) differ world-wide. A study utilizing the PAS Scale (Friedrich, 1996) was designed to investigate a sample of undergraduates from four universities in Brazil. Fifty-four percent of students strongly agreed that psychology is a science, and 26% strongly agreed that psychological research is necessary and that training in methodology is important (Morales, Abramson, Nain, Nelson, & Bartoszeck, 2005). In an Australian sample, students perceived psychology as a science within a few weeks of program commencement and their academic development influenced their perceptions of psychology as a science (Provost et al., 2011). In the U.S., non-majors, including natural science and education majors, perceive psychology as a soft-science or helping profession. However, psychology majors perceive the major to be a hard-science (Bartels, Hinds, Glass, & Ryan, 2009; Gervasio, Wendorf, & Yoder, 2010). Previous research supports the idea that completion of psychological statistical courses and research method courses is associated with an increase in scientific thinking (Amsel, Baird, & Ashley, 2011; Holmes & Beins, 2009; Friedrich & Camac, 2003).

The current investigation was designed to examine how student perceptions of psychology as a science (Friedrich, 1996) would change upon completion of introductory and research methods psychology courses. We predicted that students would report an increase in PAS scores from the beginning to the end of all psychology courses, but a larger increase would be reported in research methods courses which emphasize and/or require research experiences.

## Method

### Participants

College students ( $N = 297$ ) enrolled in 12 psychology courses over three semesters from two universities participated in our study. The majority of students were enrolled in a medium size public university in the Southeastern United States (84.2%), with the remaining attending a branch campus of a large public university in the Midwestern United States. The average participant age was 21.13 years ( $SD = 3.41$ ). Students were enrolled in introductory psychology (INTRO;  $n = 47$ ), scientific communication in psychology (COMM;  $n = 116$ ), research methods (RM;  $n = 59$ ), and a senior thesis course (ST;  $n = 75$ ). Consistent with the composition of the major, the majority of students were women (81.1%). While a variety of majors were represented, approximately 80% of the sample was psychology majors. There were 12.8% freshmen, 17.5% sophomores, 31.3% juniors, 36.3% seniors, and 2.1% "other." The racial distribution of the sample included 67.7% Caucasian, 22.5% African-American, 5.7% Hispanic/Latino, 1.3% Asian, .3% Native American, and 2.5% "other." Participants earned a minimal amount of extra credit for study participation.

### Materials & Procedure

Students completed the PAS scale (Friedrich, 1996) at the beginning (pre PAS) and end of the semester (post PAS). The PAS measure includes 20 questions, including five distractor items, with 7-point Likert agreement response scales. In addition to anticipated course grade, participants also reported their course effort and enjoyment of the course on 10-point Likert scales. Participant age, sex, class rank, and major were collected from demographic questionnaires.

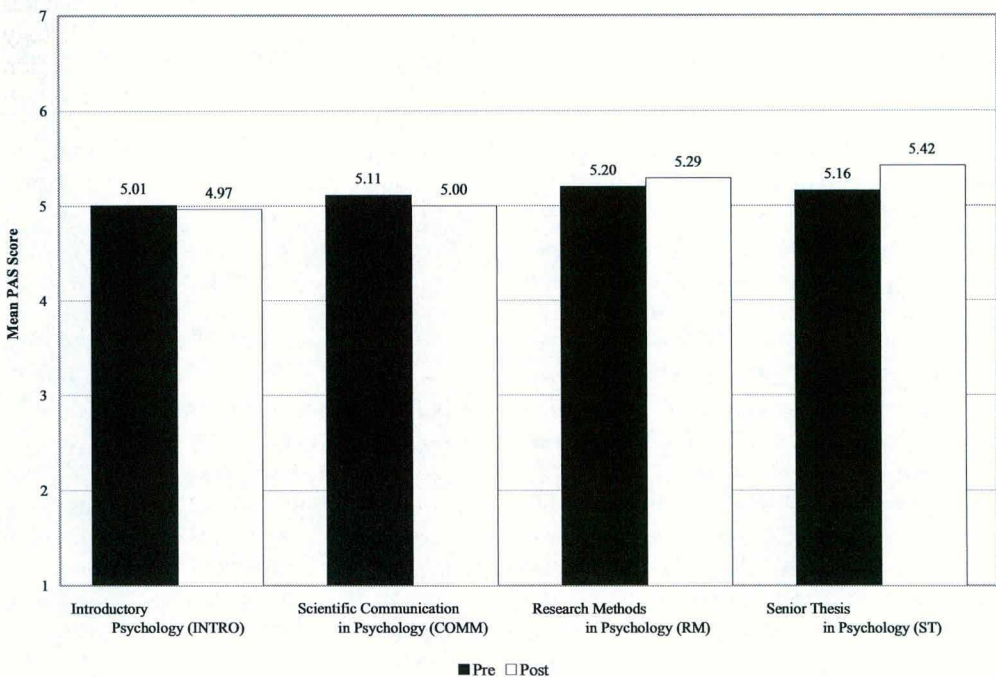
### Results

The pre PAS scores among all courses were similar,  $F(3, 293) = 1.05, p = .37$ , while the post PAS scores among all courses were significantly different,  $F(3, 293) = 8.11, p < .001$ . The post PAS scores for ST were significantly

higher than the INTRO course ( $p = .002$ ) and the COMM course ( $p < .001$ ). The post PAS scores for RM were higher than the INTRO course ( $p = .09$ ) and significantly higher than the COMM course ( $p = .04$ ). See Figure.

Difference scores were calculated to examine student PAS changes from the beginning to the end of the course. There were significant changes between pre and post PAS scores by course,  $F(3, 293) = 7.21, p < .001$ . The PAS change scores increased more for the ST course ( $M = .259$ ) compared to the INTRO course ( $M = -.042$ ) ( $p = .03$ ) and the COMM course ( $M = -.115$ ) ( $p < .001$ ), but not the RM course ( $M = .086$ ) ( $p = .46$ ). PAS change scores were not significantly different for students expecting As ( $M = .055$ ), Bs ( $M = .003$ ), or Cs ( $M = .081$ ) in the courses,  $F(2, 291) = .46, p = .63$ .

**Figure. Mean pre and post PAS scores by course. Higher scores indicate greater perceptions of psychology as a science.**



Overall, there were no significant gender differences in PAS score changes,  $F(1, 294) = 2.53, p = .11$ , although men ( $M = .142$ ) reported more positive changes than women ( $M = .005$ ). Within INTRO only, men ( $M = -.042$ ) and women ( $M = -.043$ ) reported similar PAS score changes,  $F(1, 45) = 0.0, p = .99$ .

Although confounded by course, psychology majors ( $M = .067$ ) reported a greater increase in PAS change scores than non-majors ( $M = -.115$ ),  $F(1, 295) = 4.77, p = .03$ .

Overall, there were positive relationships between PAS change scores and participant age,  $r(295) = .12, p = .03$ , course effort,  $r(295) = .16, p = .005$ , and enjoyment of course,  $r(295) = .21, p < .001$ .

No significant differences in PAS scores were found between different professors teaching the same course.

### Discussion

Despite students initially having very strong opinions that psychology is a science (over 5.0 on a 7-point scale), we found increases in PAS scores at the end of Senior Thesis (ST) and Research Methods (RM) courses, minimal changes in Introductory Psychology (INTRO), and decreases in Scientific Communication in Psychology (COMM) courses. The RM and ST outcomes were expected, but the COMM findings were not. The COMM course focused on writing and communicating, which may have made the course seem less research and science oriented.

Previous researchers have reported that psychology student perceptions of PAS increase as students complete more psychology courses (i.e., Bartels et al., 2009). However, our results did not reveal significant differences between pre PAS scores among the different level courses, suggesting that number of courses completed is not the only factor that influences PAS beliefs. However, the pre PAS scores were slightly higher for all of the advanced courses. Students can further

strengthen their perceptions of psychology as a science through courses which emphasize research methodology and/or require students to complete a research project.

One-on-one interaction between faculty and students (Bjornsen, 2000), especially working on research as in Senior Thesis, may be especially important to strengthen psychology's scientific status. Faculty mentors likely convey the importance of research, and the need for careful scientific methodology to students working with them. Individual research projects likely emphasize conducting hands-on scientific research rather than the theoretical and additional content material also covered in other courses. By the time students are engaged in research activities as a senior, they hopefully have become motivated to contribute to scientific knowledge in the field.

Past research has also revealed that perceptions of psychology as a science differ due to personality differences across genders (Harton & Lyons, 2003). There were no overall significant gender differences in PAS score changes in the current study. In the Introductory Psychology course, men and women exhibited nearly identical changes in PAS scores throughout the course. Men showed slightly higher positive changes overall, but the changes were not significantly different from those of women. With the trend of more women majoring in psychology and the STEM sciences, it appears gender differences have largely disappeared.

We did not specifically look at personality, but it is possible that personality variables could impact attitudes and perceptions of psychology as a science. There were no significant differences in scores of students expecting different grades in their course, suggesting grade motivation was not a major influence on psychology as a science attitudes. It is interesting that participant age, course effort, and enjoyment of course were all positively related to PAS change scores. Older students

probably are more advanced students who have enjoyed psychology courses and selected psychology as a major. They also could have learned that greater effort pays off with higher grades and greater enjoyment. Older students might also be more likely to be more realistic about the application of psychology to their career aspirations. Future research could consider these variables and other influences.

There were no significant differences in PAS scores found among different professors teaching the same course. This suggests a unified positive attitude of PAS among instructors in this study. Future research might investigate faculty members for their PAS attitudes.

Psychology departments may find the PAS to be a useful tool to assess student attitudes about psychology and to better emphasize psychology as a science in their respective programs. PAS information might help departments build student research opportunities into their programs, and could be used to help faculty convey the importance of scientific critical thinking in their courses.

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