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Comparative Psychology as an Effective Supplement to Undergraduate Core Psychology Courses

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This article describes the design and implementation of a 1-credit-hour seminar in comparative psychology as a supplement to an introductory biopsychology course. The purpose of the course was to introduce students to the ecological and evolutionary aspects of animal behavior by building on topics that are introduced in many biopsychology courses. This article provides suggestions for course assignments and course reading materials. The current approach of introducing undergraduate students to comparative psychology by attaching a seminar to an existing course offers a framework that could possibly be used with many other undergraduate psychology courses.

Students are often first exposed to research involving animals in introductory psychology, learning and memory, and biological psychology courses. Unfortunately, in these courses, comparative research is often necessarily covered in a perfunctory manner (Demarest, 1987), without a discussion of the ecological and evolutionary relevance of animal behavior. Because comparative research is often not the primary focus in introductory courses, some psychologists have argued that courses dedicated to comparative psychology are an essential piece of the undergraduate curriculum (Demarest, 1987; Dewsbury, 1992b; Eaton & Sleigh, 2002). This article describes the course format, objectives, and activities for a 1-credit course, Seminar in Comparative Psychology, that was offered as a supplementary section to my introductory biopsychology course. Introductory biopsychology made an excellent base for the seminar because I already present lecture material on a vast selection of behavioral and biological studies conducted with animals in that course. A course evaluating studies of animal behavior was designed to provide a supplement to that learning experience.

Course Format and Objectives

My biopsychology course met twice per week. To provide continuity between the seminar and biopsychology course, the seminar was scheduled to meet once per week following the first meeting of the biopsychology lecture. This pilot offering had a small enrollment ($N = 6$) to facilitate testing the effectiveness of the seminar format. The seminar was designed for presentation by a combination of instructor-led lectures, student-led discussions, and several films and didactic videos to illustrate the study of animal behavior.

The primary objective of the seminar was to critically discuss the ecological and evolutionary aspects of animal behavior that contribute to the comprehension of topics discussed in many introductory biopsychology courses. To address this goal, I centered the seminar lectures and course assignments around the four fundamental questions in the study of animal behavior as proposed by Tinbergen (1963): *causation*, *ontogeny*, *evolution*, and *function*. We discussed Tinbergen's four questions in detail at the first meeting of the biopsychology course and the seminar, providing a unifying thread that would guide work in both courses. In addition to the primary objective, I had several secondary goals for the seminar that included (a) developing an understanding of both the historical and modern significance of comparative research as a field of study, and (b) understanding the role comparative psychology has played in shaping the ecological dynamic and our knowledge of animal welfare.

Course Description

At the first session of the seminar, I described the course objectives and we discussed the primary article

Table 1. Suggested Lecture Topics and Course Readings in Comparative Psychology

Lecture	Lecture Topic(s)	Suggested Reading Examples
1	Introduction to the Study of Animal Behavior	Tinbergen (1963)
2	Evolution and the Central Nervous System	Students were assigned to read Greenberg, Partridge, Weiss, & Pisula (2004) and each assigned one of the follow-up commentaries (Denenberg, 2004; Greenberg & Partridge, 2004; Lickliter, 2004; Moore, 2004)
3	Behavior, Genetics, and the Central Nervous System	Blakemore & Cooper(1970); Hotta & Benzer (1972)
4	A Comparative Approach to Social Relations: Mother–Infant Bonding	Godfray (1995); Smiseth & Lorentsen (2001)
5	Chemosensory Processes	Bennett & Cuthill (1994); Hurst (1989)
6	Integrating the Senses: Kin Recognition and Social Behavior	Lenington (1994); Wedekind, Seebeck, Bettens, & Paephe (1995)
7	A Classic Evaluation of Sign Stimuli and Social Behavior	Tinbergen (1952); Rowland & Sevenster (1985)
8	Examining the Predator–Prey Relationship	Dumas (2000); Hoelzel (1991); Langley (1994)
9	Sexual Conflict and Aggression	Côté (2000); Hunter & Davis (1998); and selected sections from Emlen & Oring (1977)
10	The Question of Personality in Nonhuman Animals	Bell (2007); Wood, Glynn, Phillips, & Hauser (2007)
11	Learning	Pepperberg (1981, 2006)
12	The Dance of the Honey Bee: Communicative Behaviors	E.g., Biesmeijer & Seeley (2005); Wenner (2002)
13	Studies of Abnormal Behavior in Animals	Baker (2004); Erwin, Mitchell, & Maple (1973); van der Staay (2006)
14	Primates: A Brief Look at Our Closest Relatives	Müller (2005); Povinelli & Bering (2002); Suddendorf (2004); selections from de Waal (2001)

(Tinbergen, 1963) that would provide the basis for integrating the biopsychology course and the seminar. The remaining weekly meetings were divided into modules and included readings corresponding to weekly topics covered in the biopsychology course. I chose not to require a primary text for the seminar. Instead, I compiled a reading list for the seminar from a selection of academic texts and journals, including the adaptation of chapters from *Exploring Animal Behavior: Readings From American Scientist* (Sherman & Alcock, 2005). Additionally, several journal articles addressed topics that had been introduced in the biopsychology lecture. A brief selection of suggested topics and corresponding readings can be found in Table 1. At each meeting we discussed an average of two readings. I selected one article as a "classic" study of animal behavior (e.g., Tinbergen, 1952), and a second article (or series of articles) to demonstrate chronological advances in the research for a particular topic (e.g., Rowland & Sevenster, 1985). I required students to provide written and oral evaluations of weekly readings from Tinbergen's (1963) perspective.

Course Assignments

My seminar included three graded assignments. I designed each assignment to complement the discussions in the seminar and they were used to implement a hands-on approach to exploring topics discussed in the seminar and biopsychology course. The definition of comparative psychology as a field of study has historically involved extensive variety and controversy (Demarest, 1987; Dewsbury, 1992a, 1992b, 2000). With that in mind I designed the course assignments to address two of the primary concerns in comparative psychology. The assignments involved a simple examination of nonhuman animal behaviors for their own sake and provided a basis for comparing behaviors across species.

The first assignment involved the development of an ethogram to evaluate and describe the behavior of one nonhuman animal (vertebrate or invertebrate) that each student chose. An ethogram is traditionally a form of naturalistic observation that includes gathering data about an animal's behavioral repertoire at regular

intervals (e.g., every 10 min) in its ecological niche (e.g., Herzog, 1988). Students could observe animals in a natural setting (e.g., surrounding woodlands), a seminatural setting (e.g., a zoo), or an artificial setting (e.g., a home). The ethogram included a brief description of each behavior and had no assigned length. To facilitate the completion of the second assignment I provided verbal and written feedback regarding the depth and accuracy of the students' ethograms.

The second graded assignment built on the ethogram developed during the first assignment. Students were required to observe a second animal of the same species and engage in a qualitative and quantitative behavioral analysis of the animals. This assignment included the development of a second ethogram and the composition of an APA-style paper (approximately two to three pages in length). Students evaluated the behaviors noted while compiling the two ethograms and briefly discussed how these behaviors would influence research conducted in a laboratory setting and what might have prompted differences in the observed behaviors.

For the final graded assignment, I gave students the option to complete one of two proposed projects that included (a) using the results of the second assignment to construct a thorough follow-up evaluation of the causative, ontogenetic, evolutionary, and functional mechanisms underlying several of the target behaviors in their selected species; or (b) selecting any one category of behaviors discussed in either the seminar or biopsychology course (e.g., mating behavior, play behaviors) that could be comparatively analyzed within and across species, making sure to include humans in their analysis. During the completion of the final course project, students incorporated concepts and topics taught in the parent biopsychology course.

I graded the assignments on how well the work reflected and evaluated the behaviors observed by students. Students received extensive peer- and instructor-based feedback on both content and writing skill. Class participation during critical reflections and successful completion of the three course assignments each contributed 25% to the final course grade.

Discussion

Based on student grades, the course evaluations, and the quality of work produced by students, the primary objectives for the seminar were met. The students who were enrolled in both courses had higher average examination values and a higher final average in the biological psychology course compared to their cohort that was not dual-enrolled (descriptive statistics can be found in Table 2). Additionally, the course evaluations indicated that students enjoyed the seminar; specifically the activities and assignments involved with the seminar. The hands-on aspect of the ethogram assignment(s) engaged students and contrasted sharply with the typical didactic experience involved in many undergraduate courses. Further, several students indicated that the strengths of the seminar were its novel format, course assignments that engaged students outside the classroom, the critical reflection involved in the readings, and the small seminar enrollment. Although this seminar was designed as a 1-hr addition to a core psychology course, the assignments described in this article could certainly be implemented in an appropriate 3-credit-hour course. However, the in-depth article discussions that provided the foundation for course assignments would have to be omitted if the seminar material were incorporated into a 3-credit-hour course.

Table 2. Differences Between Dual- and Single-Enrolled Student Performance in Introduction to Biological Psychology

Category	Dual-Enrolled Students[a]	Single-Enrolled Students[b]
Examinations		
1	86.3 (3.3)	71.5 (2.3)
2	95.0 (8.1)	87.9 (1.9)
3	94.3 (2.8)	83.0 (2.4)
4	98.3 (4.0)	92.6 (1.8)
Average exam performance	93.5 (2.6)	83.8 (4.5)
Final course grade	88.5 (3.0)	79.8 (1.4)

Note. Differences are expressed as mean and *SEM* of the percentage of total points.
[a]$n = 6$. [b]$n = 29$.

In conclusion, it might be difficult in many instances to integrate a seminar-style course in comparative psychology into an introductory biopsychology course. However, the positive evaluations of this seminar demonstrate that a 1-credit-hour design is one successful alternative method to integrate comparative psychology material into the undergraduate course curriculum. This hybrid lecture–seminar format is highly adaptable to several other topics and courses already taught in many psychology departments. This course not only used biopsychology, a seldom-taught subject (Perlman & McCann, 1999a, 1999b; Wilson, 1991), in a novel manner, but also addressed the need for critical thinking and applied learning in undergraduate

university teaching. The seminar-style course described in this article would be well worth the challenge of implementation for many psychology instructors.

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Notes

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