

# Encouraging Undergraduate Research: Hanover College's Psychology Major

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## *Hanover College*

Undergraduate research is receiving increased attention across undergraduate disciplines (González, 2001; Hutchinson, 1992). The presence of this current volume indicates the importance of undergraduate research for the psychological community. One of the primary reasons for this increased emphasis is the realization that education needs to develop skills in students for life-long learning. Because of its potential to increase student investment in learning and to develop skills in critical thinking, reading and writing, student scholarship is one way to achieve this goal. The advantages of student involvement in research have been supported by several recent studies. Bauer and Bennett (2003) reported that graduates who had research experiences in college, compared to those who did not, reported greater proficiency in research design as well as more general skills such as acquiring information and public speaking.

Many of the gains from undergraduate research experience extend beyond the immediate academic domain. Compared to students who do not have research experience, those who do have such experiences report feeling more independent and self-confident (Seymour, Hunter, Laursen, & DeAntoni, 2004) and more prepared for a career (Lopatto, 2003). Moreover, these students are more likely to graduate (Nagda, Gregerman, Jonides, von Hippel, & Lerner, 1998) and are then more likely to pursue graduate education (Hathaway, Nagda, & Gregerman, 2002). The integration of scholarship into the psychology major at Hanover College is, in large part, based upon the understanding that the goal of education is to help students develop skills that extend beyond the classroom.

## **A Description of the Hanover College Psychology Department**

Hanover College is a 4-year liberal arts college of about 1,000 students. The psychology department is in the natural science division with biology,

chemistry, exercise science, geology, math/computer science, and physics. Currently, the department has five faculty members. These faculty members have specializations in social, developmental, clinical and experimental psychology. The department graduates 20 to 30 psychology majors each year.

Hanover College has a long history of promoting undergraduate scholarship. This emphasis has increased in recent years, culminating in a revision of the undergraduate curriculum that recommended all majors require an independent study as the culminating experience. Many departments, including all of the natural sciences, already required independent studies for their culminating experiences by the time the college made this recommendation.

## **A Description of the Major**

The psychology major at Hanover College underwent a major revision in 2000, with the explicit goal of increasing the number of courses that required students to engage in original research. The reasoning behind this approach was twofold. First, as mentioned above, the department requires an independent study as the culminating experience. Generating activities that helped prepare students for that year-long exercise was beneficial. Second, by having students engage in projects in different classes, they would get a chance to use some of the many and varied research methods in psychology (Krantz, Dine Young, Altermatt, & Altermatt, 2004).

## ***The First Three Years***

As depicted in Figure 1, we require students to choose one course from each box. The arrows indicate prerequisites. If there is more than one option in a box, then students can take any of the listed courses to fulfill the requirement. In addition to these courses, students must pick two other courses as electives. Student may choose these electives from any other psychology course in the catalog that

they have not taken to fulfill requirements. In addition, students must take a statistics course taught by the Mathematics department prior to research methods, and students must take a course in Biology.

Figure 1 highlights the emphasis on undergraduate research in the major. Boxes with a red outline indicate courses that have laboratory components in addition to the typical class sessions. Students take a minimum of 4 laboratory courses as part of the major curriculum. The biopsychology course and sensation and perception course can also fulfill part of a student's general science requirement. These courses aim to teach basic laboratory skills and procedures. In addition, these courses aim to use the laboratories to teach the fundamentals of doing a study, and they do leave room for students to design research to some degree. However, working in a laboratory is not the same as doing scholarship. If students are just following a prescribed set of directions, they are not learning how to ask questions using scientific methodology as much as they are learning scientific procedures and measurement techniques. As a result, the major curriculum structure builds on the initial laboratory courses and introduces more elements necessary in actually conducting research (Krantz, Dine Young, Altermatt, & Altermatt, 2004).

The courses shown in shaded squares in Figure 1 form the heart of our integration of research into the major. These courses require students to design and execute a research project. The sequence starts in the Research Design and Statistics class (PSY 220). Students taking this course learn the fundamentals of research design and how to use basic statistics to analyze data. Students work together in small groups to devise a research project, conduct the study, and then present it both to the class in a conference-style oral presentation and to the department in a poster session. This class is typically taught every term to keep enrollments to a manageable 12 to 15 students.

This foundational experience makes this course a prerequisite to more advanced laboratory and research-oriented courses in the major. In each of these 300-level courses, students again design and conduct independent research projects. These courses reinforce and build upon the experience of the research methods course and incorporate new methods specific to the course content. The learning course provides experience working with animals giving students experience with single subject methodology. The cognition course uses mostly repeated measures and factorial designs that are more complex than students usually encountered in research methods. Social psychology emphasizes between-subjects experimental designs, focusing on statistical interactions. In that course, students also

design and administer an online research project (see Krantz & Altermatt, in this volume). In Adulthood and Aging, students work in small groups to conduct a quantitative research project using narrative research methods. Specifically, the instructor asks students to interview several elderly individuals using student-modified versions of McAdams' (1995) Life Story Interview. By reinforcing statistics and research methodology in the laboratory courses, we hope to maintain and develop skills that otherwise fade after the research methods course.

### *The Senior Year*

Seniors complete their careers as psychology majors by conducting a larger independent research project. The year-long sequence allows students to work either singly or in pairs. During the fall, students participate in a seminar entitled Advanced Research (PSY 401). The primary focus of this course is the development of a research proposal. During the first part of the term, the department faculty leads students through a sequence of activities to assist them in developing their research question and hypothesis. These activities include group discussions of articles they are reading; group discussions of their emerging research ideas; and one-on-one discussions of their ideas with two or more faculty members. About one-third of the way through the term, students write a short paper describing their project and identify two faculty advisors with whom they prefer to work. Application of several criteria, including student preference, faculty expertise and equitable faculty work load, play a role in assigning faculty advisors.

Subsequently, students work primarily with their faculty advisors to shape their project proposal. At the end of the term, students give an oral presentation of their proposal, inviting comments by all of the faculty and fellow students. The department faculty encourage students to take an active part in these discussions with the goals of developing a research group atmosphere among the students and providing support for each other. The written proposal is graded by two faculty members: the advisor and one other member of the department.

In the Research Seminar (PSY 462) course students carry out their proposal, including data collection, analysis, and writing. During the first half of the semester, students meet only with their faculty advisors and work on data collection and analysis. During the second half of the term, students and faculty resume meeting as a class to hear progress reports and practice presentations from each group. In this way, students practice public speaking skills and prepare for their final presentation. On the last

day of the term, students attend an undergraduate research conference at another institution. All of the students present their research at this conference. They also prepare a manuscript of their project in APA journal format, which is graded by two faculty members. The range of projects that have been completed by these students over the years has been impressive. A list of past projects is available at <http://psychlab1.hanover.edu/Research/SeniorSeminar/>.

## Resources

Implementation of senior projects demands considerable resources, particularly faculty time. By making the senior projects into a formal two-semester course, one faculty member can receive partial credit toward her or his course load for coordinating the first semester, and all faculty members can receive partial credit in the second semester. The department also helps fund the student projects, but usually the expense has been minor. Access to a large and diverse pool of participants can also be an issue, but with the availability of online research, this issue has become less of a concern (see Krantz & Altermatt, in this volume).

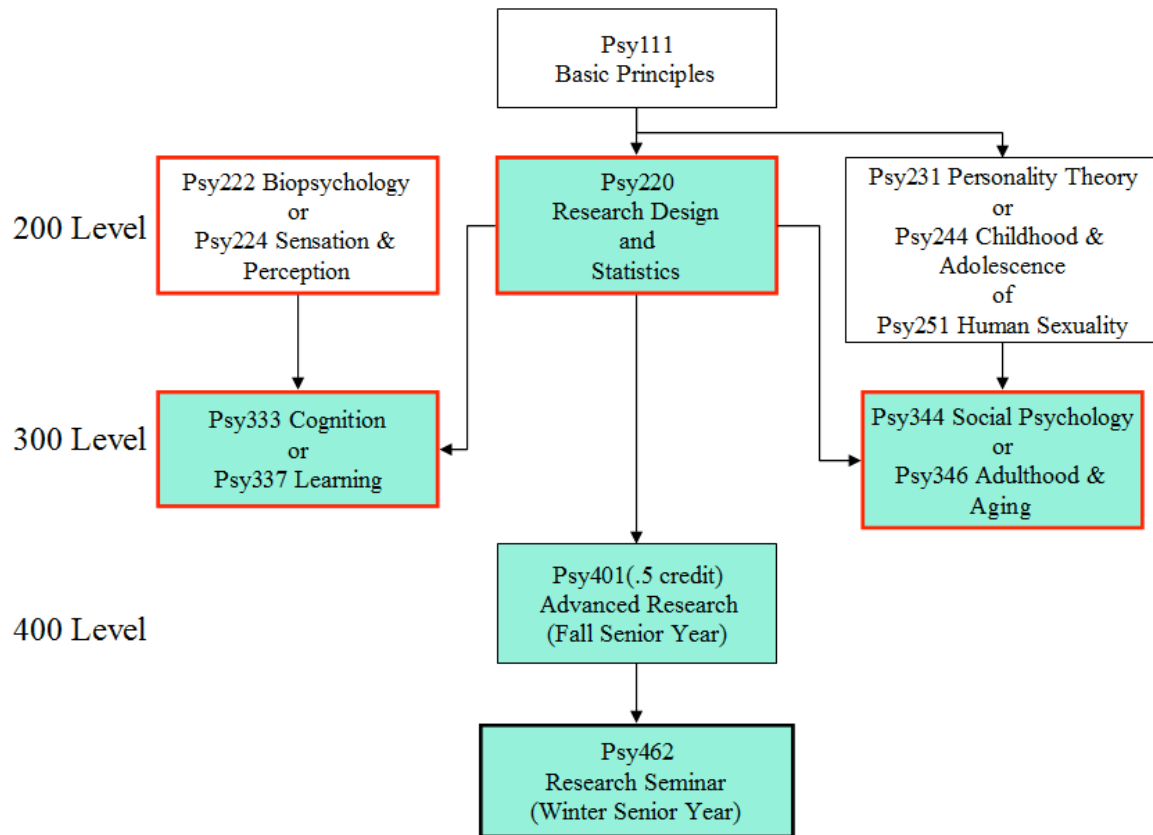
## Conclusion

The intention of the Hanover College Psychology Department approach is to engage all of its majors in the research process. We do not just teach students *about* psychological concepts and methods, but we expect them to *do* psychology. The curriculum gives students a strong foundation in how to go about asking and answering questions in a sound empirical manner. In addition, students repeatedly communicate their findings both in manuscript and presentation formats developing their ability to communicate their research. Our philosophy is that students are not simply being taught a research method, they are learning *a process of inquiry*. This experience prepares students who are going to graduate school in psychology, but it also prepares students who do not take that path. For example, even students who go directly into a business setting can benefit from the experience of following an extended project from beginning to end. Furthermore, the experience of working independently encourages them to take responsibility for work and for their learning. Most importantly,

because they have learned how to ask and answer basic questions, they will have a better grasp of the “big picture” (i.e., why their work really matters), and they can be confident in the conclusions they reach.

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**Figure 1.** An outline of the Hanover College psychology major.