Student Research in Psychology Courses

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A foundation for every undergraduate psychology program is a class on some form of research methods. Not only does this class provide students with tools to design experiments, but perhaps more importantly, it teaches them to think critically and skeptically, not only about psychology, but about being better consumers of information and hence better citizens. In this post post-modern era, where the claim is that "you have your evidence, I have mine; all are equal," a research methods class is a critical venue for emphasizing what science is and what it is not. An effective tool to convey this information lies in having students actively conduct research as a course requirement. Currently, roughly 60 percent of methodology classes require students to engage in a research project lasting two weeks or more (Perlman & McCann, 2005). Given my personal experience with and without this component, I hope to see this number increase. Whether you are contemplating initiating this approach or are a veteran, hopefully one or more of the following tips will improve your classroom experience. A number of these tips may prove useful in other courses that involve data collection, or they may motivate an addition of such a component in these classes (e.g., Introductory Psychology).

Institutional Review Board (IRB)

Collecting data from human participants should entail a consultation with the appropriate IRB (National Institute of Health, 2006). There are some old-timers who still claim that collecting classroom data is a pedagogical exercise and that you do not need IRB approval if it is not going to be published. However, if you go down this road, you preclude your students from presenting or publishing any interesting findings. I would advise everyone to engage the IRB — better safe than sorry, and with undergraduates sometimes adopting some independent methods you are not aware of, the legal coverage cannot hurt.

The IRB is often a busy committee, and it is not going to want to review hoards of student proposals each semester. If possible, cut a deal. At Gonzaga, the agreement is as follows: The instructor of the research methods class must take the NIH online certification (http://www.nihtraining.com), which gives the authority to approve any minimal-risk projects in the classroom. At the end of each semester, the instructor must send a list of the titles of the projects to the IRB. This feedback is painless and fast. You are covered legally, and you can reject inappropriate student ideas out of hand ("I am sorry but depriving people of sleep and measuring its effect on sexual activity is not minimal risk Joe…").

Group Projects and Social Loafing

Unless you have very small classes, you are going to have to utter the words that 90 percent of students hate: "You will be working in small groups this semester." Groups of three to four students per project work best; anything larger and there is too much diffusion of responsibility. The dark side of group projects is, of course, social loafing. One practice I have found effective is to have students do all written work independently. A final grade based solely on these assignments (essentially drafts of the introduction, methods, results, and discussion, and an assembled paper at semester's end) results in a clean indication of individual merit. I do not grade individual contributions to research design, the creation of experimental materials, etc., as they are easily divisible tasks, so social loafing should be

relatively rare (Steiner, 1972; Sharon & Sharon, 1976).

However, if one does choose to grade these less tangible aspects of the project, some form of peer feedback evaluation is probably essential. Though knowing such evaluation is forthcoming is a deterrent to loafing, end-of-semester assessments of these evaluations can be tricky, and grade adjustments should be made only with a strong consensus. Designing questions that minimize personality differences and assess direct contribution is helpful in determining the nature of the group dynamics, but they could still be subject to personal bias. Group members who receive negative feedback from others are likely to claim they were actively excluded from participation, despite their best efforts. A good compromise is a peer-evaluation system (and the resultant loafing-deterrence effect), followed by a conservative adjustment policy.

From past experience, I address the issue of sharing on the syllabus: no group member is required to share any resources (e.g. references for the literature review), although they are not prevented from doing so. A previous lack of clarity on this issue has resulted in within-group conflict, with students placing uncomfortable demands on other students.

Assigning Groups

Are you going to let students choose the composition of their own groups, or will you assign them? In addition to immediate self-selection, another possibility is to allow students to get to know each other early in the semester through class exercises and to subsequently choose groups. If one does allow self-selection, I advise designing some process whereby students can "divorce" each other at any time with specific rules about what must be shared and how work will be completed. Friends (or lovers) at the beginning of the semester may no longer be so at the end, and group dynamics may become unworkable. As I find splitting up groups too unwieldy, I do not allow such divisions and instead rely on initial random assignment to groups. Individuals may not necessarily like each other, but they can usually maintain a formal enough relationship to get the project done. If possible, I actually employ a faux random assignment that balances groups based on my perceived assessment of ability and motivation.

Choosing a Research Topic

Lower-division students typically have little idea of what constitutes a psychologically interesting and logistically possible project for a semester. The first decision here is whether to "seed" the idea pool or not. The most direct approach to seeding is providing access to a file of past projects, "do-able" research areas, journals of undergraduate research, etc. Students are quickly directed to fertile ground for projects, minimizing false starts and then subsequently "tweak" or otherwise alter an existing experiment to explore new ground. One problem with this approach lies with the subsequent experimental design process. A project too similar to an existing experiment allows for much of the heavy lifting of the design process to be retrieved from prior research. If this is the case, an artificial prohibition is probably necessary to encourage working through the process of research design.

For this reason, I do not mind having students engage in research that is not conceptually sound or that an experienced researcher might find uninteresting, if their work entails arriving at completely original operational definitions and having to address numerous potential confounds from scratch. For me, working through the methodological problems is more important than content. Therefore, I have students develop ideas "cold."

I initially describe minimal risk and then allow 30 minutes or so of class time to generate ideas. We briefly discuss possibilities, with members from all groups piping-in, and then I send them on their way. Most really good ideas will come outside the classroom over time. Three subsequent class meetings are scheduled to home in on a "do-able" experiment. Groups propose their ideas and, after input from classmates, are guided toward workable projects.

Addressing Three Problems with Proposals

Once a topic area is ethically in the ballpark, inevitably the next obstacle concerns proposals that are much too specific, much too general, or of questionable psychological interest.

Too specific: Employ the up-down technique. The first step is to pull them up a layer by determining the theoretical question that might be answered by their study. Once this question is identified, the second step is go back down a layer and determine the most efficient way to answer this question, which often has little resemblance to the initial proposal. Nevertheless, the result is a proposal that the group feels they invented and for which they take ownership.

Example: "We want to study whether males or females push the elevator button more often."

Up-response: "Well what are you really trying to study?" Some possibilities to draw out might be: "Are males or females more impatient?" or "Are there gender differences in the belief that technology often fails?"

Down-response: "Okay, if we are trying to evaluate patience, is there an easier, better way to measure it?" Students then come up with operational definitions until a project is workable. Pedagogically, this interactive process allows students to directly address the relationship between theory, constructs, and operational definitions, and is complemented by a lecture I conveniently schedule just prior to this process.

Too general: Here, simply state that no one experiment could address the question they pose and narrow them down to a specific population, context, etc. This process is relatively painless. If you provide them with a few alternatives, they will usually arrive at others of their own.

Questionable interest: Informing them that performing a literature review would take much more time for an off-the-wall topic is usually sufficient to deter them. A simple refusal works too. Often, however, one can find some related issue with which groups can work, and again, for which they can take ownership.

A final thought — some projects are so ubiquitous that you may create a list that simply rules them out. The classic "studying with or without music" comes to mind. Although it probably is workable in terms of literature reviews and having students design methodology, it may be unworkable in terms of your sanity overseeing the project for the umpteenth time.

Structure

For many research methods classes employing data collection, the final goal is an APA-style paper reporting the research. This can be a daunting task unless some form of division occurs throughout the semester. At scheduled due dates, I collect drafts of the introduction, methods, results, and discussion,

which are graded and returned. Assigning a grade is necessary to encourage effort at these stages, but I reserve the bulk (75 percent) of the final grade for the final paper. This allows some rigorous criticism and grading of the drafts that motivates subsequent performance, without prematurely precluding students from a decent overall grade. The final paper is due at the end of the semester, graded according to a tally sheet provided to the students with the initial syllabus.

Collecting Data

During the proposal process, I strongly encourage groups toward collection of data during specified class periods — I reserve a time from the lab and one from the lecture for data collection. This allows two possible times for students in other courses to be participants (for extra credit) and provides two ready-made groups for between-participant designs. It is also safer. If data collection is in the classroom or laboratory, you know what is going on. In the field, who knows? Experimental designs where participants are tested individually are tricky unless one has a dedicated space for such projects. If one has this luxury, on-line participant sign-up software can often streamline this process.

I often discourage observational studies as I want students to work through the problems associated with operationalizing true independent variables. However, if you allow them I would again emphasize the ethical issues that occur without informed consent. It is safest to forbid both altering the environment or any interaction with the observed person.

Analyzing Data

Whether to assign students to analyze their own data depends on your teaching philosophy, student preparation, the size of class, the strength of your department statistics program, and so forth. I meet with each group and walk them through the inferential statistics, but if your students have a statistics background, it is probably better to let them go at it themselves. At a minimum, assign them the descriptive statistics. Let them collate the data and see if there are differences in group means. They collected the data, let them have the fun of first discovery!

Presentations and Publication

There are outlets for student publication (e.g., *Journal of Psychology and Behavioral Science*, *Journal of Undergraduate Research*, *Psi Chi Journal of Undergraduate Research*), and at many teaching universities, such an outcome is beneficial for tenure/promotion review. Keep in mind, if you collected data without IRB approval, this will not be an option. The promise of publication is also a carrot that motivates students throughout the semester to have cleaner research. They likely will not hit the jackpot, but then again they just might.

Many universities have regular poster sessions where undergraduates present experimental findings. If so, consider making this a course requirement, as it has a number of merits. The public nature of the project increases motivation, students make a physical poster, and they gain confidence in public presentation and speaking. Often regional conferences exist for undergraduate poster sessions, allowing networking with other students and faculty and further adding to their comfort in public presentations. Another possibility is to schedule a poster session for the last day of class and have faculty and interested students drop by and discuss the projects.

Final Thoughts

After shifting to an approach where students design, run, analyze, and interpret experiments while

working in small groups, my methods class has improved greatly; students are more interested and engaged in lecture material, and the changing nature of the projects keeps the content fresh every semester. Subsequent to this change, student ratings for the class have broadly increased (a full point on a seven-point scale) and now are on par with my other classes. As an added bonus, one enters a cooperative and collaborative relationship with one's students. No longer only engaged in evaluation, one becomes a teammate in the common goal of scientific inquiry. I always feel a special bond with psychology majors who have taken my methods class for just this reason: We have worked together, and discovered something together.

In addition to the lab, the lecture component of the class can also improve. Discussions of particular techniques are no longer abstract hypotheticals, but rather tools students think about with regard to their own studies. Discussing within- versus between-participant designs now becomes relevant to the student's particular experience. When one discusses counterbalancing, one can use examples right from class, rather than an abstract or historical example. I strongly recommend employing active research components in lab sections of methodology courses and incorporating student projects into lecture material. Give it a try — implementation is easier than you think, and you will be pleasantly surprised by the results.

References

Atkinson, J.M. (1982). Understanding formality: The categorization and production of "formal" interaction. *British Journal of Sociology, 33*, 86-117.

Cartwright, D. (1968). The nature of group cohesiveness. In D. Cartwright & A. Zander (Eds.), *Group dynamics* (3rd ed., pp. 91-109). New York: Harper & Row.

Horner, D.T., Stetter, K.R., & McCann, L. (1998). Adding structure to unstructured research courses. *Teaching of Psychology, 25*, 126-128.

Lott, A.J., & Lott, B.E. (1965). Group cohesiveness as interpersonal attraction: A review of relationships with antecedent and consequent variables. *Psychological Bulletin, 64*, 259-302.

National Institute of Health. (2006). *Regulations and ethical guidelines*. Retrieved May 24, 2006, from http://www.nihtraining.com/ohsrsite/guidelines/graybook.html#app3

Perlman, B., & McCann, L.I. (2005). Undergraduate research experiences in psychology: A national study of courses and curricula. *Teaching of Psychology, 32*, 5-14.

Sharan, S., & Sharan, Y. (1976). *Small group teaching.* Englewood Cliffs, NJ: Educational Technology.

Steiner, I.D. (1972). *Group processes and productivity.* New York: Academic.