

Conducting Research at the University of Wisconsin-Eau Claire's Campus Autism Program

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The purpose of this chapter is to describe how clinical research is conducted at the University of Wisconsin-Eau Claire's Campus Autism Program (CAP). More specifically, the chapter will include a description of four components deemed important in preparing students to conduct research at the undergraduate level.

The CAP was developed as part of a behavioral emphasis within the Psychology department. The Psychology department decided to start an emphasis in behavior analysis for undergraduate students to address a local and national need for therapists trained in behavior analysis to work primarily with children diagnosed with autism. To this end, the emphasis includes three didactic courses in behavior analysis and an internship. Although the didactic courses were already offered within the department, the internship course had to be developed according to the supervision requirements of the Behavior Analysis Certification Board (BACB). The requirements set forth by the BACB require intense supervision by a certified behavior analyst in a university based program. Therefore, the CAP was started as a university program to meet these requirements.

The CAP serves children ages 1-5 who are diagnosed with a pervasive developmental disorder, usually autism. The program therapists include undergraduate students who are pursuing a psychology major and completing an emphasis in applied behavior analysis. The CAP serves four main functions. First, the CAP provides behavioral intervention to young children with autism who otherwise would not receive such treatment. Second, the CAP fulfills the experience requirements to become an associate behavior analyst as set forth by the behavior analysis certification board. Third, the requirements for working at the CAP plus the clinical experience prepare students for graduate school, and as a result approximately 75% of the students attend graduate school immediately upon graduation. The fourth function, and the one to be addressed in this chapter, is the opportunity to engage in research at the undergraduate level.

Training undergraduate students to conduct research begins by requiring students to take the first two courses in the behavior analysis emphasis. The content in these courses is extremely important in preparing students to conduct research. For example, in the introductory course students are taught basic behavioral principles, behavioral measurement, single-subject experimental designs, and ethics. In the second course (advanced applied behavior analysis) students learn more advanced behavioral treatments, how to read and analyze research manuscripts and journal articles, and how to begin developing treatment plans. Perhaps most importantly, students in the advanced course are required to learn and implement the steps for conducting a thesis similar in scope to what is required in graduate behavior analysis programs (minus implementation of the study). This project requires the student to read primary research in behavior analysis, develop a research question, write a research protocol, create data that demonstrate experimental control, write a manuscript similar in scope to one that would be submitted for publication, and defend the thesis via an oral defense modeled after a graduate thesis defense. Although implementing the procedures and collecting data in a semester time frame is not feasible, students have a basic understanding of the steps for starting and completing a study by completing the requirements to this project. At this point students typically begin working and conducting research at the CAP.

To conduct research at the CAP, a student must first develop a research protocol. The experience from the thesis project in the advanced course usually results in students having an understanding of how to begin the initial steps. To aid in this process, a research meeting is offered once per week for an hour. Students can register for one to three credits each semester to participate in this course. The format of the research meeting requires each student to develop their own line of research interests, read past and current literature, write a research protocol, and deliver a power point presentation several times per semester of the current status of their research or

of a particular published article that is related to their interests. In developing research interests and a protocol, the students are required to read articles published in mainly behavior analytic journals. Reading published articles allows students to both review relevant literature and examine a model for how to write a protocol.

As students begin developing research interests and writing a protocol, understanding the type of research typically conducted at the CAP is important. The research conducted at the CAP focuses on a small number of participants, direct measurement of behavior targeted for change, and a demonstration of experimental control of the variables responsible for behavior change. Therefore, the research protocols written and conducted at the CAP primarily consist of single subject designs. Two factors have led to the use of single subject designs. First, data analysis is usually conducted at the individual level in the field of applied behavior analysis. Single subject designs are useful for isolating specific environmental variables, including whether treatment procedures are responsible for behavior change. By using these designs, then, students learn to evaluate whether their treatment is working on a clinical level and to demonstrate experimental control on the research level. The second factor is that CAP serves a small number of children (4-6) individually for an hour four days per week. Given the intensive nature of the therapy provided for a relatively small number of children, single subject designs are the most appropriate tool for analysis.

The array of research topics appropriate for investigation at the CAP is closely tied to the needs of young children with autism. Since the focus of the research must include direct measurement of behavior change, most of the studies to date have been an investigation of either skills that young children with autism need to learn or of procedures that are used to teach these skills. For example, most of the children who enroll at the CAP have little or no ability to communicate (a characteristic of autism). Although there is a myriad of research reports on teaching communication skills to children with developmental disabilities, few studies and little technology exists for teaching young children with autism to talk (vocal verbal behavior). Moreover, a fairly new area burgeoning in applied behavior analysis is verbal behavior. This new area of research involves investigating communication as a functional behavior based on the work of B.F. Skinner (Skinner, 1957).

One study in the area of verbal behavior conducted at the CAP involved teaching vocal skills to two young children with autism. A relatively new procedure, stimulus-stimulus pairing, has been

previously investigated in a few studies to increase vocal behavior for children with few or no vocal sounds. This procedure requires a teacher to say a vocal sound while delivering a reinforcing stimulus (pairing the sound with the reinforcer). The child does not, however, receive the reinforcing stimulus for saying the sound. After pairing the sound with a reinforcer for a specified number of trials, the child is observed for several minutes and any vocal the child makes is recorded. An increase in vocal sounds would likely be due to self-reinforcement (not socially mediated) because the vocal sounds were not directly reinforced. Past research has shown an increase in the number of vocal sounds during the post pairing period for some children with autism.

The study conducted at the CAP extended past research by investigating whether the procedure could be used to increase vocals, and subsequently get the vocals under echoic control, for two children who were two years old (Carroll & Klatt, in press). An undergraduate student became interested in the topic while completing the thesis type project in the advanced behavior analysis course. When the student began working at the CAP, she had already developed the protocol for implementing the study. The student also identified a few other students enrolled in the behavioral emphasis who agreed to serve as interobserver and procedural reliability observers. The student who implemented the study was responsible for not only developing the research idea and protocol (with faculty supervision) but also creating data collection sheets, identifying preferred toys, collecting and graphing data, and frequent communication with the faculty advisor.

In the case of this particular study the student was intimately involved in developing and implementing the entire study. Furthermore, the student had a major role in writing the manuscript for publication and, when accepted for publication, was responsible for many revisions. While this particular student worked relatively independently, many of the students working at the CAP need much supervision and assistance for each step in the process. This requires a significant time commitment from faculty that is not necessarily built into their course load. In most cases, the students need considerable time on a daily basis with help writing the protocol and on troubleshooting various problems associated with conducting research.

Conducting research at the CAP involves several important components, summarized in the Table 1. Despite the amount of work involved in helping undergraduate students conduct research, many favorable outcomes are achieved. For example, usually only the top performing students in a department are interested in committing the time

necessary in conducting a study (especially when the expectations are high). Therefore, a faculty member benefits by the opportunity to work with the brightest students. Another favorable outcome is the accumulation of valuable experience for an undergraduate student that is normally reserved for graduate students. The end result is a vita for an undergraduate student that includes numerous conference presentations, lab or applied work experience, and in some cases publications.

References

- Carroll, R. A., & Klatt, K. P. (in press). Using stimulus-stimulus pairing and direct reinforcement to teach vocal-verbal behavior to young children with autism. *The Analysis of Verbal Behavior*.
- Skinner, B. F. (1957). *Verbal Behavior*. Englewood Cliffs, NJ: Prentice Hall.

Table 1

CAP Research Components

1. Coursework in behavior analysis
 - *Basic behavioral principles
 - *Behavioral measurement
 - *Single-subject experimental designs
 - *Ethics
 - *Writing, evaluating, and defending a protocol
2. Internship
 - *Meets requirements of BACB
 - *Intensive training and supervision
3. Weekly research meeting
 - *Read current literature
 - *Develop research interests
 - *Write research protocol
 - *Present power point presentations
4. Professional development
 - *Attend conferences
 - *Present data via posters or symposia
 - *Publish studies in peer reviewed journals