

# Experimental Design in CMSD: Focusing on the Single-Subject Research Design Syllabus

**CMSD 632-01 (2 credits)**  
Communication Sciences and Disorders Program  
**California State University, Chico**  
Spring 2018

## Course Contact Information

Faculty	David McCoy, Ph.D.
Class times	6:10 – 8:00 Wednesdays due to clinic schedules
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Office Hours	Tuesdays 12:30 - 2:30 p.m. & Wednesday 1:30 – 4:30 p.m. I have an open-door policy, come chat when you can.

Final Exam: Informally Wednesday scheduled 5/16/18 from 6:00-7:50. Official time to be posted online. Check your class schedule after the 4<sup>th</sup> week of classes. Historically the exam has been at 5:00 p.m. by mutual agreement.

## SYLLABUS

- Copies of the course syllabus and major assignments may be found on Blackboard <https://learn.csuchico.edu>
- You are responsible for regularly checking the online resources, which can also be accessed through the portal at <http://portal.csuchico.edu>
- The syllabus and course plans are subject to change with advance notice.

## COURSE DESCRIPTION

Single-subject research designs (SSD) are prevalent in the research literature in communication disorders. SSDs may be applied to only one subject or to a small number of subjects who are evaluated as *separate individuals* rather than as members of a larger group to be averaged together. SSDs are most frequently applied in clinical settings, where the primary emphasis is on the therapeutic impact. This course teaches the student clinician how to generate single subject experimental designs that apply baseline and treatment segments to collect data to assess the variables of interest. Students will use research methods knowledge to locate and critically evaluate research literature and electronic media.

## **COURSE OBJECTIVES**

Following successful completion of this course, students will be able to

- a) describe the nature and purpose of SSDs,
- b) explain how SSDs can be applied to the day-to-day practice of a speech-language pathologist,
- c) explain SSD research strategies and research design in communicative disorders,
- d) describe measurement issues, and
- e) evaluate how SSDs fit into what we know about levels of evidence, response to intervention, and generalization
- f) orally and visually present information in a format consistent with professional conference formats.

These outcomes will in part enable students to meet the ASHA Standards for the Certificate of Clinical Competence in SLP: III-B.

These outcomes will in part enable students to meet the Council of Academic Accreditation (CAA) of the American Speech, Language, Hearing Association (ASHA) and the ASHA Certificate Standards of Clinical Competence (CFCC) in Speech-Language Pathology

- The student will demonstrate knowledge of processes used in research and of the integration of research principles into evidence-based practice (IV-F<sup>I</sup>, 3.1.1B<sup>II</sup>) for treatment efficacy with support from various types of evidence (research designs) of various quality.
- The student will demonstrate current knowledge of the principles and methods of intervention for people with communication and swallowing disorders (IV-D<sup>I</sup>) in one of the areas (IV-C<sup>I</sup>) with critical reasoning and evidence-based practice process skills (3.1.1B<sup>II</sup>, CMSD SLO 3)
- The student will demonstrate knowledge of practical statistics in the social/behavioral sciences (IV-A<sup>I</sup>)
- The student will acquire and demonstrate knowledge of the nature of speech, language, hearing and communication disorders and differences, as well as swallowing disorders, including etiologies, characteristics and anatomical/physiological, acoustic, psychological developmental, linguistic and cultural correlates. (IV-C<sup>I</sup>) in one or two areas of intervention (3.1.5B<sup>II</sup>, CMSD SLO 3)
- The student will acquire and demonstrate knowledge and skills in oral and written communication sufficient for entry into the profession (V-A<sup>I</sup>) with effective forms of expressive communication, including interactions with peers (3.1.1B<sup>II</sup>, CMSD SLO4 & 5)
- The student will demonstrate knowledge of standards of ethical conduct in research (IV-E<sup>I</sup>, 3.1.1B<sup>II</sup>)
- The student will demonstrate ability to think critically, flexibly, and creatively, analyze and integrate learning, reason, express informed opinions, information literacy, and utilize judgment across diverse concepts and problems (CMSD SLO 1)

- I. CFCC - Council for Clinical Certification in Audiology and Speech-Language Pathology <https://www.asha.org/Certification/2014-Speech-Language-Pathology-Certification-Standards/>
- II. CAA - Council on Academic Accreditation in Audiology and Speech-Language Pathology. <https://caa.asha.org/wp-content/uploads/Accreditation-Standards-for-Graduate-Programs.pdf>

#### Prerequisite Note

“All CMSD graduate courses require admission to the CMSD Master's program.”  
<http://catalog.csuchico.edu/viewer/17/CMSD/CMSDNONEMA.html>

### **COURSE MATERIAL**

#### **REQUIRED**

Riley-Tillman, T. C. & Burns, M. K. (2009). *Evaluating Educational Interventions: Single-Case Design for Measuring Response to Intervention*. New York: The Guilford Press.

- An ebook version is available for “checkout” online via the library website. Caution: only one Chico enrolled student can electronically checkout the book for up to 2 hours each time, so plan ahead. It makes accessing the book for in-class activities a challenge.
- A printed copy of the textbook is available at the MLIB Reserve Circulation Desk for your use up to 24 hours. Plan ahead, other may have the book when you plan to use it. Have alternative plans.

#### **RECOMMENDED**

Schiavetti, N., & Metz, D. E. (2011). *Evaluating Research in Communicative Disorders*, (6<sup>th</sup> ed.). Needham Heights, MA: Pearson.

#### **ADDITIONAL READINGS MAY BE ASSIGNED**

Brobeck, T. C., & Lubinsky, J. (2003). Using single-subject designs in speech-language pathology practicum. *Contemporary Issues in Communication Science and Disorders*, 30, 101-106.

Byiers, B. J., Reichle, J., & Symons, F. J. (2012). Single-subject experimental design for evidence-based practice. *American Journal of Speech-Language Pathology*, 21(4), 397-414. Doi:10.1044/1058-0360(2012/11-0036)

Kearns, K. P. (1986) Flexibility of single-subject experimental designs, Part II: Design selection and arrangement of experimental phases. *Journal of Speech and Hearing Disorders*, 51, 204-214.

McReynolds, L. V., & Thompson, C. K. (1986) Flexibility of single-subject experimental designs, Part I: Review of the basics of single-subject designs. *Journal of Speech and Hearing Disorders*, 51, 194-203.

Other readings as assigned and made available via Bb or the Reserve Circulation Desk.

## ADDITIONAL WRITING RESOURCES

*Publication Manual of the American Psychological Association 6<sup>th</sup> edition.*

- This manual outlines the elements of a manuscript and also specifies grammar, punctuation, and preferred scientific/clinical spellings. It is essential to homework assignments and the final project.
- In addition, the student is encouraged to purchase a dictionary; spell-check is woefully inadequate with respect to providing guidance for clinical/technical writing.
- Available in two places in Miriam Library, the reference area and possibly the circulation desk.
- A grammar guide such as *The Elements of Style* by Strunk and White.
- The Purdue OWL website is an excellent writing resources.
- The Chico State Library has a number of online research and writing resources.

## EVIDENCE-BASED PRACTICE (EBP) WEBSITES

- <http://www.cochrane.org/>
- <http://www.asha.org/members/ebp/>
- <http://www.asha.org/members/ebp/compendium/>
- [http://guides.lib.unc.edu/EBP\\_Education\\_COE](http://guides.lib.unc.edu/EBP_Education_COE)
- <http://www.rti4success.org/>
- Other online resources will be added with links on Blackboard

## COURSE REQUIREMENTS/EVALUATIONS

### POINTS

25 points	Completion of an evidence-based practice (EBP) summary supporting current SSD proposal or your current clinic client if different than project participant
10 points	Oral presentation reflection
25 points:	Final exam

*The SSD research project will be comprised of four equally weighted components.*

*A draft of each section will be submitted prior to being graded for points on the scheduled due dates.*

25 points:	Introduction, literature review
25 points:	Methodology
25 points;	Results and discussion
<u>50 points:</u>	Dissemination of SSD in oral class presentation and <i>mockup</i> conference poster
250 points	Total

You may present your project in class with a draft version of your poster. The final version is due before the final exam time and day. You do NOT need to print your poster.

### ATTENDANCE

See syllabus appendix for additional attendance information.

Regular and on-time attendance is critical, *as a large portion of coursework is performed in class*. Please notify the instructor in advance if it is necessary to arrive late, leave early, or miss a class. Students should contact the instructor by telephone or e-mail, the latter is preferred. No quiz or exam make-ups will be offered for unexcused absences. More than 1 absence during the semester may have a substantial impact on your grade. Contact the instructor in advance.

## **INFORMATION LITERACY**

This refers to the ability to locate, evaluate and effectively use evidence-based information. Information literacy will be critical to your Research Project. The CMSD major has a research librarian to support students' research needs.

## **READINGS**

Readings will be announced in class and posted on Blackboard. Students are strongly encouraged to read the assigned readings prior to class meetings. The readings in this course are a primary source of information from which discussions in class will be an extension, minimal class time will be used to review the content of the readings. Rather, class time will be used to discuss, analyze, synthesize, and apply the content to the research project and other applicable practical clinical cases.

## **PROJECT**

- Additional information to be provided in a separate handout.
- You will work with a partner with a clinical focus on 1 client currently enrolled in the clinic as a client of you or your partner.
- You and your partner will work with your clinical supervisor to determine an evidence-based practice (EBP) and response to intervention (RTI) planned and single-subject designed intervention (independent variable) and client behavior (dependent variable) that can be implemented and measured during the prescribed course of treatment for the selected client this semester.
- The final project will be submitted and presented in the form of a conference-like poster (a blank template and completed models to be provided on Bb) and a written script of the oral version of your talking points. Poster presenters typically have an overview 2 minutes oral summary of the research and a 7-10 minute more detailed summary of the research. You and your partner will present a 10-minute presentation to the class and answer 2 or more questions from the audience.
- The research poster will be developed for a mock conference but that meets all the requirements of an ASHA or CSHA research poster presentation guidelines (link on Bb and below), including the following components: abstract, introduction, methods, results, figures, discussion, and references sections. The components will include information presented in the CMSD 488 Research Methods course or based on a resource such as or the equivalent of the recommended textbook or this course by Orlikoff, R. F., Schiavetti, N., & Metz, D. E. (2014) *Evaluating Research in Communication Disorders* (7<sup>th</sup> ed.). Boston, Pearson Publishing.
- Poster Guidelines from ASHA:
  - <http://www.asha.org/Events/convention/Poster-Session-Information-For-Presenters/>

Important note: The final grade is not dependent on the progress made by the client. If a change of client or any other clinical decision impacts the project in this class, you will NOT be penalized. Alternative assignments will be provided to meet the academic learning requirements of the course.

### COMMON FEATURES OF A RESEARCH PRESENTATION POSTER:

- **Introduction** will include some of the summarized information from your review of the evidence assignment, including but not limited to:  
Quick Start Overview of the Steps to Include:
  1. Describe your client (age, disorder, clinical setting of treatment)
  2. Find the Evidence. This will usually require more than 1 article, but not always.
    - a. Starting with available systematic reviews or a meta-analysis (Level I) (a variety of public resources are available via ASHA and others, linked on Blackboard and listed in the syllabus).
    - b. Then consider related individual research studies (Level II).
    - c. Lastly, expert opinions, case studies, and non-reviewed articles (Level III and IV). Remember, articles in the ASHA Leader are in the category of the lowest level of evidence, see below)
  3. Describe your assessment of the evidence quality. All research is not created equally.
  4. Describe your rationale for your clinical decision to implement (a) a treatment (independent variable), (b) the target behavior or goal (dependent variable), with considerations for the client's needs or values and your professional clinical expertise.  
<http://www.asha.org/Members/ebp/steps.htm>
- **Methods** will include a description of the client, advantages or purpose of single-subject designs in clinic and research, type of single-subject design you used, protocol (implementation of intervention and phase implementation), target behavior of change (dependent variable).
- **Results** will include a single-subject design figure and narrative results description of possible within and between phases changes.
- **Discussion** will include conclusions (including whether intervention is the most likely cause for the change), clinical implications, limitations (threats to internal and external validity), and future directions or context in which the information can be applied or extended with modifications.
- **References**, figures, citations, and poster will be formatted according to the current version of the APA Publication Manual.
- **Abstract** is more commonly included on posters but is a space consuming feature that is not always necessary because the reader already has all the information available to them.
- **Identifying information:** poster title, authors, and institution, and in many cases the year and venue at which the presentation was completed

Final Exam Wednesday 6:00 – 7:50 pm 5/16/18

- a. Possible dissemination of research if necessary (presentations)
- b. You must prepare for the exam independently.
- c. Completed Talking Points Narrative and final version of Posters DUE

- d. OFFICIAL Final Exam time will be posted on your class schedule in the portal after the 4<sup>th</sup> week of classes.

A course up-to-date schedule is available on the Course Info and Welcome page in Bb.

### **CMSD 632**

Communication Sciences and Disorders Program, Spring 2018

Schedule DRAFT

*The up-to-date schedule is available on Bb if different from below*

#### Week

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|----|--|
| 1  | Overview of Research Principles  |
| 2  | ASHA EBP Steps and Practices   |
| 3  | Chapters 1 and 8   |
| 4  | Chapters 2 and 3 Identifying the IV, DV, time-series link  |
| 5  | Chapters 3 and 4 Design planning for clinic data collection  |
| 6  | Chapters 2 and 5 Implementing SSD  |
| 7  | Levels of Evidence and Systematic Reviews  |
| 8  | Catching up  |
| 9  | Case study models for summarizing the evidence base and methods                                    |
| 10 | Appendices A & B   |
| 11 | Chapter 6  |
| 12 | Chapter 7  |
| 13 | Presenting clinical data as results and preliminary discussion                                     |
| 14 | Review SSD and RTI, including MTSS   |
| 15 | Presentations  |
| FW | Presentations and Final Exam Wednesday 5/16/18 at 5pm by common agreement or officially at 6:00 pm |