



The use of Single-Subject Research Designs in Special Education

EDSP 670
Spring 2018

Course Description

The course is designed to provide students with an extensive background in the design and analysis of single-subject research. The emphasis on applications of such research designs and methodology help to prepare discipline-based practitioners to teach effectively in a pluralistic society. We will begin by addressing issues relevant to the design of empirical research in general and then proceed to issues related to single subject designs.

Learning Objectives

Upon completion of the readings, assignments, and study related to the course topics you will be able to:

1. Discuss in writing the advantages and disadvantages of single subject experimental designs as contrasted with group experimental designs.
2. Define in detail the terms internal and external validity and state how single-subject designs control for threats to validity.
3. Describe, recognize, and give examples of each of the four basic methods commonly used to observe behavior.
4. Be able to explain what is meant by the term reliability and state why it is important.
5. Compute reliability, given recordings of two or more observers.
6. Given a published research study, identify the design employed and evaluate its adequacy with respect to internal and external validity.
7. Describe in writing the procedures for implementing the following single subject designs and critically evaluate them with respect to internal and external validity:
 - (a) Withdrawal and Reversal
 - (b) Multiple baseline
 - (c) Multiple probe
 - (d) Changing criterion
 - (e) Multitreatment
 - (f) Alternating Treatments, Adapted ATs, and Multi-element
 - (g) Parallel Treatments
 - (h) Combination
8. Display data graphically, accurately, and consistent with accepted norms
9. Evaluate the appropriateness of decisions or conclusions on the basis of given set of data

Required materials

We will be using personal response devices (clickers.umd.edu) in class. You may elect to use a clicker device, purchased through the bookstore, or you may download Response Ware for free and use your cell phone as your response device. Your responses through the clicker challenges in class constitutes a portion of your participation grade.

Instructor: Dr. Kelli D. Cummings, NCSP
Office: EDU 1311C
Phone: (301) 405-6498
Email: kellie@umd.edu
Class Meets: Tuesdays
4:15pm – 7:00pm
EDU 2119

Office Hours
By appointment
EDUC 1311C

Course Format

Lecture notes, homework, and other course documents are published at www.elms.umd.edu under this course name. All presentations and materials used in class will be available on the course website by the start of each class. Feel free to bring a tablet or laptop to class to access and take notes on PowerPoint slides. Some essential information will be presented in class only, and you will need to take notes beyond what is provided on the slides.

Required Textbook

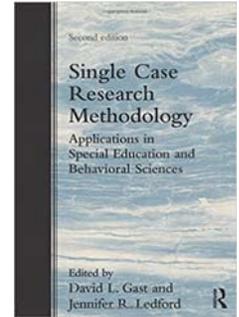
Gast, D.L. & Ledford, J.R. (2014). *Single case research methodology: Applications in special education and behavioral sciences* (2nd ed.). New York: Taylor & Francis ISBN: 978-0-415-82791



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It is your responsibility to register your Turning Point account and link it to Canvas as well as bring your device to the classroom. If you forget to bring your clicker or do not have it connected to Canvas, you will miss that day's in-class practice opportunity.



University Policies

As a student, you have the responsibility to be familiar with and uphold the *Code of Academic Integrity* and the *Code of Conduct*, as well as for notifying your course instructors in a timely fashion regarding academic accommodations related to absences and accessibility as indicated below. You also have the right to know the expectations set by University Policy. The University of Maryland values the diversity of its student body and is committed to providing a classroom atmosphere that encourages the equitable participation of all students.

University Policies outlined at this link are particularly relevant to your experience in graduate academic courses: <http://apps.gradschool.umd.edu/Catalog/policy.php?the-academic-record>. Topics that are addressed in both policies include academic integrity, student and instructor conduct, accessibility and accommodations, attendance and excused absences, grades and appeals, copyright and intellectual property.

Course-Specific Policies

1. *Attend all class periods and participate in class discussions and activities.* Regular attendance and participation in this class is required and is the best way to grasp the concepts and principles that are discussed. Events that justify an excused absence include the following:
 - Participation in university activities at the request of university authorities
 - Mandatory military obligation
 - Religious observance during one of our class meeting days
 - Student illness or the illness of an immediate family member
 - Compelling circumstances beyond the student's control (e.g., death in the family, required court appearance)

To receive academic accommodation for an excused absence please notify me in a timely manner, either prior to the absence or as soon afterwards as possible. In the case of religious observances, athletic events, and planned absences known at the beginning of the semester, please let me know during the schedule adjustment period. All other absences must be reported as soon as is practical. You must also provide appropriate documentation of the absence. You may, one time per course per semester, provide a self-signed excuse as documentation of an absence from a single class that does not coincide with a major assessment or assignment due date. For all other medically necessitated absences, students must provide documentation from a physician or the University Health Center.

Work to be made up following an excused absence will typically be completed within one week of your return (i.e., by 11:59 on the seventh day following the return) but this timeline may vary depending on the type of assignment to be made up.



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For more information on the University of Maryland's policy on excused absences, as well as all UMD course-related policies, please visit <http://apps.gradschool.umd.edu/Catalog/policy.php?the-academic-record>.

- Come to class prepared to learn.* Success in this course depends upon being familiar with the readings, prior to class assignments and related activities. Arrive to class on time, and bring necessary materials (i.e., clicker, laptop, assignments) to every class. When you attend class, it is my expectation that you will be fully engaged in class activities. If you use your laptop for note taking, refrain from non-course related activities such as using social media, texting, or continuously checking email. These behaviors, along with side conversations, are very distracting to the other students in the class as well as the course instructor. Please turn off or silence cell phones. If it is necessary to receive a call, notify the instructor, set the phone to vibrate, and take the call outside of the classroom. If I notice that a student is regularly distracted, not engaged, or posing a distraction to others, I will ask that we meet to discuss participation in class. If the behaviors continue, I will make a referral to the student's advisor.
- Engage in respectful discussions and be open to new or different ideas.* Throughout this class you will be challenged to think crucially about the impact of cultural, sociological, and experiential events on students' behavior and learning. These may be different from your own perspective as a learner but are critical to understanding the perspective of your students as a professional who is working with diverse learners. Please participate in discussions openly and respectfully using **person-first language** when speaking and writing about people with disabilities and other groups, and use acceptable terminology when addressing issues of gender, race, ethnicity, disability, sexual orientation, and other areas of diversity. Students are encouraged to take risks in class by asking difficult questions and sharing their stories and comments. It is acknowledged that the instructor or students make mistakes in this regard, but it everyone's responsibility to respond constructively to any conflicts or problems that arise. Language used in assignments and class discussions (written and spoken) should be respectful and professional at all times. All people will be treated respectfully in this course.
- Turn in assignments on time.* All assignments must be completed before the beginning of class and submitted on or before the assigned due date. Most assignments will be turned in on Canvas and the time stamp on Canvas will be used to determine when the assignment was submitted. All work submitted for the class must be legible, clearly organized, and proofread. Standard APA formatting will be used in the course, typed work will be 12-point font, with one-inch margins, and double-spacing.
- Complete your work with honesty academic integrity.* The University of Maryland has a nationally recognized Code of Academic Integrity. This code sets standards for academic integrity at Maryland for all undergraduate and graduate students and is an important resource for you. As a student you are responsible for upholding these standards in your courses. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. The Student Honor Council (SHC) is a resource on campus for both students and faculty that educates the community on academic integrity as well developed the honor pledge, which has been in use campus-wide since September, 2002. For more information on academic integrity at the University of Maryland, please visit the SHC website: <http://www.shc.umd.edu/SHC/Default.aspx>

Bear in mind that even if the Honor Code is not requested, **it is your responsibility to ensure that your work is completed independently unless I explicitly and directly tell you to hand in an assignment with a partner or in a group.**



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6. *Course Evaluations (CourseEvalUM)*. Your participation in the evaluation of courses through CourseEvalUM is a responsibility you hold as a student member. Feedback is confidential and important to improve teaching and learning at UMD as well as to the tenure and promotion process. Go to www.courseevalum.umd.edu to complete your evaluations.

Course Communication

I will primarily communicate with you outside of class via our Canvas web pages, Canvas email, group messages, and Canvas Announcements. On occasion we may arrange meetings via Google Hangout (username: kellic@umd.edu) particularly if you need extra help with an assignment outside of office hours. I also will communicate with you extensively through feedback on your assignments. **Please see the next page (p. 6) for directions on how to view my feedback in Canvas. Viewing my annotated comments on your assignments is one of the most important aspects of the class for you to attend to.**

I would like to hear from you, too! Your feedback is very important to me. I take your comments seriously and I want to know what's working well for you in the course (as well as anything that is not working!) as soon as possible. As a result, there are multiple ways of providing feedback in class outside the end-of-semester evaluations. Please take advantage of my office hours, or set up an appointment to meet me on campus. Email me, Canvas works best. I will ask you to participate in an exit ticket activity at the end of each class (see p. 10 for more details). This ticket counts toward your participation but also serves as real-time feedback about the course that I use for progress monitoring and to make instructional changes immediately if needed. You can also provide confidential feedback through my faculty mailbox in Benjamin 3214. I encourage you to let me know your thoughts on the course so that I have a chance to make improvements throughout the entire semester

A Note on Grading and Feedback in this Course: Most of your assignments will be graded in Canvas as electronic submissions. My grading style is to make comments *and annotations* on the papers you submit. In order to see my **comments**, please click on the "view feedback" button. Scroll to the bottom of this page for details: <https://guides.instructure.com/m/4212/1/54359-how-do-i-view-instructorcomments>. In order to see my **annotations**, another step is required. *This is the most important step for you to see my individualized comments and suggestions for your work.* Please follow the detailed instructions on the following help page and see me for assistance if you have any trouble: <https://guides.instructure.com/m/4212/1/352349?data-resolve-url=true&data-manual-id=4212>

Extra Credit: In the interest of fairness and equity, there are **no** extra credit assignments or special arrangements available to make up for low performance on any graded course work. The instructor may provide opportunities for class-wide extra credit – but there is no guarantee of extra credit throughout the semester. In this class you will have several opportunities for self-evaluation based on formative assessment data from your own performance.

Get Some Help!

You are expected to take personal responsibility for your own learning. This includes acknowledging when your performance does not match your goals and doing something about it. Everyone can benefit from some expert guidance on time management, note taking, and exam preparation, so I encourage you to consider visiting <http://ter.ps/learn> and schedule an appointment with an academic coach. Sharpen your communication skills (and improve your grade) by visiting <http://ter.ps/writing> and schedule an appointment with the campus Writing Center. Finally, if you just need someone to talk to, visit <http://www.counseling.umd.edu>.



Everything is free because you have already paid for it, and **everyone needs help**... all you have to do is ask for it.



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Grades

I have assigned point values to our in-class work as well the final project or exam and other assignments. Final letter grades will subsequently be assigned on the basis of overall class performance and will be rounded using conventional rules. Letter grades correspond to the point cutoffs listed here. Please note: It is possible to earn the following grades in this class: A+, A, A-, B+, B, B-, C+, C, C-, D+, D, D-, F. The “+” and “-“ have been added to grades in order to allow for more nuance and precision in the evaluation process. Grades will be assigned according to the following chart:

| Final Grade Cutoffs | | | | | | | | | |
|---------------------|--------|---|--------|---|--------|---|--------|---|--------|
| + | 98.00% | + | 87.00% | + | 77.00% | + | 67.00% | | |
| A | 93.00% | B | 83.00% | C | 73.00% | D | 63.00% | F | <60.0% |
| - | 90.00% | - | 80.00% | - | 70.00% | - | 60.00% | | |

Grades are not given in this class, but earned. Your grade is determined by your performance on the learning assessments in the course and is assigned individually. If earning a particular grade is important to you, please speak with me at the beginning of the semester so that I can offer some helpful suggestions for achieving your goal.

All assessment scores will be posted on the course ELMS page. If you would like to review any of your grades, or have questions about how something was scored, please email me to schedule a time for us to meet in my office.

I am happy to discuss any of your grades with you, and if I’ve made a mistake I will immediately correct it. Any formal grade disputes must be submitted in writing and within one week of receiving the grade. Do not wait until the end of the semester to review earlier assignments and exams. All students should be aware of the University of Maryland’s policy on “arbitrary and capricious grading” and understand the process by which they can appeal a final grade: <http://www.ugst.umd.edu/coursereLATEDpolicies.html>

| EDSP 670 Assignments | | | | |
|---|---|-------------|----------------|-----------------|
| Name | # | Points Each | Category Total | Category Weight |
| Reading Responses | 6 | 5 | 30 | 9% |
| Reading Jigsaws | 2 | 15 | 30 | 9% |
| Journal Review 1 | 1 | 0 | 0 | 0% |
| Journal Reviews 2 &3 | 1 | 40 | 80 | 25% |
| Midterm exam | 1 | 50 | 70 | 22% |
| Participation | 2 | 10 | 20 | 6% |
| Final Project | 1 | 70 | 70 | 22% |
| Exam 2 (70 points) | | | | . |
| Research study (50 points for the paper, 20 for the presentation) | | | | . |
| Asynchronous Class Activity (2/13) | 1 | 20 | 25 | 7% |
| Total | | | 325 | 100% |

A. *Reading Responses*: Students are expected to read articles and chapters as assigned on the course syllabus and to be prepared to share what you learned about that content during class. You should make notes that are useful to remind you of the content you read some of the time and to prepare a written summary about the course readings at other times. You must complete a total of 6 written responses about the in-class readings. You may decide which readings what to take notes on and which to write summaries of to turn in.



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For each written reading response: (a) Provide a summary (no longer than a paragraph) in your own words of the overall main points from the articles (2 pts), (b) Describe two things you learned or thought was important and that add to your understanding of research (list or write a few sentences for each) and provide a page number to connect your thought back to the text (1 pt), and (c) provide two-three questions for discussion during class (2 pts). These responses should be submitted to ELMS on the Monday before class by 11:59pm.

B. *Reading Responses Jigsaw*: Each student will co-lead part of a class discussion based on assigned readings. For example, on 2/16, in addition to reading book chapters, students are asked to read an article. If you are the jigsaw leader during this week, you are responsible for highlighting important ideas from the chapter that others might not have read. We count on you and your partners to know this content in depth. However, rather than expect you to plan together outside of class time, you will have 10 min to discuss content that you have been assigned with your partner(s) before leading the discussion on that content.

Please provide the following information when leading the discussion on your article or chapter:

- Review the overall main points (3-5 minutes) (5 pts)
- Review the three things you learned and/or thought was essential information that you could potentially relate to your understanding of research in general or RPP research in particular (3-5 minutes) (5 pts)
- Lead a discussion about important concepts or topics introduced. Use the questions and points from your written responses and/or your peers' responses to previously read materials when available. (5 pts)

C. *Review writing*: Each student will be expected to write three reviews of research articles using the format supplied by the *Journal of Applied Behavior Analysis*. Students will be evaluated on the tone of their review (e.g., constructive instead of harsh) and on their evaluation of the methodology, analysis, results, and discussion sections of the articles. The first review will be considered a practice session with feedback and will not be counted toward the final grade.

D. *Take-home Exams*: There will be a midterm and an *optional* final exam in the course. Exams will contain essay, application, and multiple choice questions on all of the material covered to that point. Exams are to be completed independently, with a time limit, and without accessing any materials outside of your textbook, notes, and course readings. Exams will be cumulative.

E. *Final project*: Students will complete one final project for the class, a research study or a cumulative final exam. Both options are described below.

1. *Option 1: Research Study*. Students who select this option are expected to design, implement, and write a single-subject research study. The project must include replication across at least three subjects, settings, behaviors, or teachers. The final write up must be consistent with the guidelines from the 6th edition of the publication manual for the American Psychological Association. Please make sure that you have access to a copy of this manual while you are writing this report.

You should start thinking of topics early in the semester. As each design is covered (e.g., reversal), you should decide what is most applicable for your project. Students who select this option must email a proposal for their project to me by March 1. Your proposal should include, a) a description of the general area that you will be investigating, b) participant(s) and setting, c) observational procedure(s), and d) research design. Final projects will be due during final exam week, on the same day as the exam. Evaluation of the project will be based on the completeness of each section (e.g.,



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abstract, introduction, methods, results, discussion, and references). Special attention will be given to the method and result sections.

Each student who selects this option will present the results of their project in class. Students should provide copies of relevant data sheets, graphs, or other presentation materials to the other members in the class. The presentation should follow the general outline of the final paper. Specifically, (a) statement of problem area and why it was of interest, (b) description of participants/setting, (c) detailed presentation of procedures, (d) design used, (e) results (present graphs, tables, etc.), (d) discussion

2. *Option 2: Final Exam.* In lieu of completing a research study students may elect to complete the take-home final exam. This exam will be cumulative, and will include multiple choice as well as essay and application questions. The University of Maryland does not announce final exam dates until the middle of the semester. The final exam date will be announced on Canvas as soon as determined by UMD.

G. *Asynchronous Course Meeting.* In lieu of meeting in person on Tuesday 2/13 students will read Chapter 7 in the Gast textbook and complete an online activity regarding measurement and reliability.

H. *Participation.* Class attendance and participation are also evaluated throughout the semester. Students will be evaluated based on their participation in small-group activities (evidenced through work completion, group assignments, notes, etc.), class discussion, in-class presentations, responses to click queries, and response to exit tickets (see below). **Please note that in order to participate fully in the class, you must attend class and arrive on time.** Approximately halfway through the course, I will ask you to evaluate yourself using a participation rubric. I will then provide my evaluation and you will receive an average midterm participation score (10 pts. possible). We will repeat the process at the end of the course for the average final participation score (10 pts. possible). **(20 points total).**

The **Exit Ticket** is a formative assessment that allows me to collect information from you at the end of each class regarding your understanding of covered content and your enjoyment of class. I will allow five minutes at the end of each class for you to complete an exit ticket on ELMS (the link to complete each exit ticket will be linked to the class page). You will select a value between 1 (low) and 5 (high) to indicate your understanding and enjoyment of the class. You will also record any questions of confusion you are facing. We will compute weekly averages and share these data throughout the semester. Submitting your ticket each week will count towards your overall **participation score.**



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Course Calendar

| Date | Topic | Chapters to read in Gast | Articles for Discussion |
|------|--|--------------------------|-------------------------|
| 1/30 | Introduction to class Research approaches and conducting research in education and clinical settings | 1, 2 | |
| 2/6 | General factors in measurement and evaluation | 5 | |
| 2/13 | Asynchronous class Dependent measures and measurement systems Reliable measurement | 7 | |
| 2/20 | Visual representation of data | 8 | 1. |
| 2/27 | Visual analysis of graphic data | 9 | 2. |
| 3/6 | Withdrawal and reversal designs | 10 | 3. |
| 3/13 | Multiple-baseline and multiple probe designs & review for midterm exam | 11 (p. 150-top of 155) | 4. |
| 3/20 | UMD Spring Break 3/18 – 3/25 | | |
| 3/27 | Exam 1 Comparison designs | | |
| 4/3 | Combination and other designs | 12, 13 | 5. |
| 4/10 | Brief experimental designs Journal review procedure Format of articles | 14 | 6. |
| 4/17 | Comparative designs Repeated acquisition designs Combined designs In class article critique (article A) | 10, 12 | 7. |
| 4/24 | Social validity Ethical principles | 16 | 8. |
| 5/1 | In class article critique (article B) | | 9.10 |
| 5/8 | Last class Presentation of final projects Study for final exam | | |

Readings for Group Discussion (Available on Canvas)

1. Babkic, A.M. & Provost, M.C. (2004). Teachers as researchers. *Intervention in School and Clinic*, 39(5), 260-268.
2. Horner, R.H., Carr, E.G., Halle, J., McGee, G., Odom, S., & Wolery, M. (2005). The use of single-subject research to identify evidence-based practice in special education. *Exceptional Children*, 71(2), 165-179.
3. Kratochwill, T.R., Hitchcock, J.H., ...& Shadish, W.R. (2013). Single-case intervention research design standards. *Remedial and Special Education*, 34(1), 26-38.
4. Forman, S.G., Shapiro, E.S., ... & Stoiber, K.C. (2013). Implementation science and school psychology, *School Psychology Quarterly*, 28(2), 77-100.



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5. Lucyshyn, J.M., Albin, R.W., Horner, R.H., Mann, J.C., Mann, J.A., Wadsworth, G. (2007). Family implementation of positive behavior support for a child with autism. *Journal of Positive Behavior Interventions*, 9(3), 131-150.
6. Wolery, M., & Lynne Lane, K. (2009). Writing tasks: Literature reviews, research proposals and final reports. In D. Gast (Ed.), *Single subject research methodology in behavioral sciences* (p. 32-56). New York, NY: Routledge.
7. Klein, L.A., Houlihan, D., Vincent, J.L., Panahon, C.J. (2015). Best practices in utilizing the changing criterion design. *Behavior Analysis Practice*. 10.1007/s40617-014-0036-x
8. Carr, J.E. (2005). Recommendations for reporting multiple-baseline designs across participants. *Behavioral Interventions*, 20(3), 219-224.
9. Scruggs, T.E. & Mastropieri, M.A. (2013). PND at 25: Past, present, and future trends in summarizing single-subject research. *Remedial and Special Education*, 34(1), 9-19.
10. Nese, R.N.T., Horner, R.H., Dickey, C.R., Stiller, B., Tomlanovich, A. (2014). *Decreasing bullying behaviors in middle school: Expect respect*. *School Psychology Review*, 29(3), 272-286.