

85-418/718

Contributions of Psychological Research to Education

Fall, 2016

Site Address: <http://www.psy.cmu.edu/~sieglar/class-index.html>

Dr. Robert S. Siegler, rs7k@andrew.cmu.edu
Tues/Thurs 1:30-2:50 pm - - - Room 336A Baker Hall

(Updated 8-23-16)

Click [HERE](#) for the Syllabus

This seminar has several goals. The most specific is to provide an opportunity for you to learn about the many contributions that psychological research has made to the field of education. You will learn about topics ranging from how best to organize instruction to maximize learning and memory for the material to how to improve reading comprehension in different age groups to how to help children learn mathematics.

A somewhat more general goal is to illustrate how psychologists who want to have their research impact education go about investigating an area they feel can have an impact and the varied types of evidence that they collect to shed light on the issues in that area. For example, this course will examine methods used to evaluate hypotheses about the key components of reading, writing, and mathematics.

A third goal of the course is to illustrate the multi-faceted challenges facing educators. The population of children attending school has become increasingly diverse, with many coming from low-income environments and homes where standard English is not spoken. These changes in society have increased the challenges facing teachers and other educators. Assessing these challenges and identifying means for meeting them is another major goal of the course.

The fact that this is a small seminar, rather than a large lecture, offers both opportunities and challenges. The opportunities are for people to express themselves actively on a regular basis, rather than sitting back and absorbing what a lecturer or a textbook tells them. The challenges are that with no one giving a lecture, the quality of the class depends at least as much on what you do as on what I do. For this reason, the ground rules of the class are different than most. First, attendance is obligatory; I expect everyone to be at each class meeting. I realize that on rare occasions, it is impossible to be at a particular class, but these exceptions should be kept to a minimum. Second, everyone is expected to actively participate in the discussion. This is essential if the class is to be a true seminar, rather than degenerating into a rotating lectureship. Third, everyone is expected to be at class on time.

Grades in the course will be based on class participation (20%), a midterm (20%), a 5 page, double-spaced paper (20%), and a final (40%). Class participation will include discussions of articles that are led by each of you and also participation when one of your classmates or I are leading the discussion. The topics where you will lead the discussion will be chosen by you at the beginning of the semester. When leading the discussion, it is important to pose good questions to bring out the main points and different perspectives on the issues raised in the article. It is especially important to participate actively when other people lead the discussion, to insure that the experience is a good one for them and for the entire class.

When it is your turn to lead the discussion, you will be responsible for posting discussion questions to the Google document that will be shared by the class. In order to obtain access to our shared Google document (SGD), send your email address to my research coordinator, Terra Treasure, at tt2p@andrew.cmu.edu, and she will add you to the access group. You will receive an email notification when you have been added. Discussion questions for each class should be posted on our SGD **at least a week** before the relevant class. If you have any difficulties with the SGD, let Terra know as soon as possible.

The key criteria for grading class participation will be (1) a reasonable quantity of high quality contributions when you are not leading the discussion and (2) posing important and stimulating questions and leading an interesting discussion when you are. Remember: If you contribute interesting and informed perspectives when others lead the discussion, they are likely to do the same for you.

The paper will be on a topic of your choice that is relevant to the class and about which you'd like to learn more. It's essential that you obtain my permission to do the topic in advance; this avoids problems that can easily arise where a topic is too broad to cover well or too narrow for much to be known about it. Also strongly encouraged, but not required, is submitting a draft of the paper to me a week or more before it's due. If you do so, I will provide comments on the paper and let you know what grade it would receive if it were your final version. Past experience indicates that students who avail themselves of this opportunity tend to get better grades in the course than those who do not. The best papers state a hypothesis about the topic that is being reviewed and then analyze the papers in terms of how their results bear on the hypothesis.

The midterms and final will be based on the questions posed by you and me about the readings. The midterm and final will include 10 short essay questions, each worth 10 points; most or all will be taken from the questions posed to the class, both by me and by you. The final exam will be similar to the midterm, but it will be cumulative.

By the end of the course, you should be able to:

1. Describe the basic contributions that psychological research has made to the field of education to date;
2. Understand and be able to explain the various considerations that must be taken into account in doing the kind of research that can have an impact on teaching and educational success;
3. Describe and evaluate research methods for producing data that can impact teaching in the broader society;
4. Understand how research can affect teaching techniques in ways that are general across academic areas and ways that are specific to given areas,
5. Critique individual journal articles on such dimensions as whether the conclusions follow from the results, whether the experimental techniques were directly relevant to the issues central to the study, whether confounds were present that call the researchers' conclusions into questions, and whether the researchers ignored relevant evidence favoring a different conclusion;
6. Lead discussions of research studies and the broader issues that motivated the studies in a way that leads your classmates to participate actively; and
7. Explain to others well thought out ideas regarding different areas of study that could be undertaken by researchers in the future that would benefit education even more.

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Fall, 2016

Site address: <http://www.psy.cmu.edu/~sieglersyllabus.html>

Syllabus

Dr. Robert S. Siegler, rs7k@andrew.cmu.edu

Tues/Thurs 1:30 -2:50 pm - - - - BH336A

This site was last updated on 4-8-16.

Below is the Fall, 2016, syllabus for 85-418/718. A pdf version of each reading can be accessed by clicking on the appropriate link in the listing below. You can read the material online or download and print the pdfs. (If need be, click [here](#) for a free copy of Acrobat.)

For more information about this class, please visit the [class home page](#).

If you have any questions regarding the class or the class website, please contact Dr. Siegler at rs7k@andrew.cmu.edu or Terra Treasure, Dr. Siegler's Research Coordinator, at tt2p@andrew.cmu.edu.

Date	Topic & Links to the Readings
8-30-16	Introduction to Class General Principles
9-1-16	Organizing Instruction and Study to Improve Student Learning, Part 1, pp 1-17 LINK: http://www.ies.ed.gov/ncee/wWc/PracticeGuide.aspx?sid=1
9-6-16	Organizing Instruction and Study to Improve Student Learning, Part 2, pp 19-34
9-8-16	Organizing Instruction and Study to Improve Student Learning, Part 3 Readings: 1. Pashler, H., Rohrer, D., Cepeda, N.J., & Carpenter, S.K. (2007). Enhancing learning and retarding forgetting: Choices and consequences. <i>Psychonomic Bulletin & Review</i> , 19, 187-193. 2. Dufresne, A., & Kobasigawa, A. (1989). Children's spontaneous allocation of study time: Differential and sufficient aspects. <i>Journal of Experimental Child Psychology</i> , 47, 274-296.
9-13-16	Reading, Writing, and Language Arts Improving Reading Comprehension in Kindergarten Through 3rd Grade, Part 1, pp 1-22 LINK: http://www.ies.ed.gov/ncee/wWc/PracticeGuide.aspx?sid=14
9-15-16	Improving Reading Comprehension in Kindergarten Through 3rd Grade, Part 2, pp 23-39
9-20-16	Improving Reading Comprehension in Kindergarten Through 3rd Grade, Part 3 Readings: 1. Williams, J. P., Nubla-Kung, A. M., Pollini, S., Stafford, K. B., Garcia, A., & Snyder, A. E. (2007). Teaching cause-effect text structure through

	social studies content to at-risk second graders. <i>Journal of Learning Disabilities</i> , 40(2), 111-120. 2. Palincsar, A. S. (1986) . Reciprocal teaching. In A. S. Palincsar, D. S. Ogle, B. F. Jones, & E. G. Carr (Eds.), <i>Teaching reading as thinking</i> (pp. 5-10). Oak Brook, IL: North Central Regional Educational Laboratory.
9-22-16	Assisting Students Struggling with Reading, Part 1, pp 1-18 LINK: http://www.ies.ed.gov/ncee/wWc/PracticeGuide.aspx?sid=3
9-27-16	Assisting Students Struggling with Reading, Part 2, pp 19-31
9-29-16	Assisting Students Struggling with Reading, Part 3 Readings: 1. Juel, C. (1988) . Learning to read and write: A longitudinal study of 54 children from first through fourth grades. <i>Journal of Educational Psychology</i> , 80(4), 437-447. 2. Connor, C. M., Morrison, F. J., Fishman, B. J., Schatschneider, C., & Underwood, P. (2007) . The early years: Algorithm-guided individualized reading instruction. <i>Science</i> , 315(5811), 464-465.
10-4-16	Improving Adolescent Literacy: Effective Classroom and Intervention Practices, Part 1, pp 1-20 LINK: http://www.ies.ed.gov/ncee/wWc/PracticeGuide.aspx?sid=8
10-6-16	Improving Adolescent Literacy: Effective Classroom and Intervention Practices, Part 2, pp 21-37
10-11-16	Improving Adolescent Literacy: Effective Classroom and Intervention Practices, Part 3 Readings: 1. Schunk, D. H. (2003) . Self-efficacy for reading and writing: Influence of modeling, goal setting, and self-evaluation. <i>Reading & Writing Quarterly</i> , 19(2), 159-72 2. Duffy, G. G. (2002) . The case for direct explanation of strategies. In C. C. Block & M. Pressley (Eds.), <i>Comprehension instruction</i> (pp. 28-41). New York: Guilford
10-13-16	Teaching Elementary School Students to Be Effective Writers, Part 1, pp 6-26 LINK: http://www.ies.ed.gov/ncee/wWc/PracticeGuide.aspx?sid=17
10-18-16	Teaching Elementary School Students to Be Effective Writers, Part 2, pp 27-39 Topic for Paper Due
10-20-16	Teaching Elementary School Students to Be Effective Writers, Part 3 Readings: 1. Cutler, L., & Graham, S. (2008) . Primary grade writing instruction: A national survey. <i>Journal of Educational Psychology</i> , 100(4), 907-919 2. Ferretti, R., Lewis, W., & Andrews-Weckerly, S. (2009) . Do goals affect the structure of students' argumentative writing strategies? <i>Journal of Educational Psychology</i> , 101(3), 577-589
10-25-16	Midterm Exam -- to be held in the Psychology Dept Computer Cluster, BH 332P
10-27-16	Improving Mathematics Learning * * * Visit to Children's School * * * Teaching Math to Young Children, Part 1, pp 7-35 LINK: http://www.ies.ed.gov/ncee/wWc/PracticeGuide.aspx?sid=18
11-1-16	Teaching Math to Young Children, Part 2, pp 36-55

11-3-16	Teaching Math to Young Children, Part 3 Readings: 1. Whitehurst, G. J. (2014) . Does pre-k work? It depends how picky you are. <i>The Brown Center Chalk Board, No. 56</i> , Brookings Institute. 2. Siegler, R. S. (2009) . Improving the numerical understanding of children from low-income families. <i>Child Development Perspectives</i> , 3, 118-124, doi: 10.1111/j.1750-8606.2009.00089.x	
11-8-16	Developing Effective Fractions Instruction for Kindergarten through 8th Grade, Part 1. pp 1-25 LINK: http://www.ies.ed.gov/ncee/wWc/PracticeGuide.aspx?sid=15	
11-10-16	Developing Effective Fractions Instruction for Kindergarten through 8th Grade, Part 2, pp 26-46	
11-15-16	Developing Effective Fractions Instruction for Kindergarten through 8th Grade, Part 3 Readings: 1. Siegler, R. S., Fazio, L. K., Bailey, D. H., & Zhou, X. (2013) . Fractions: The new frontier for theories of numerical development. <i>Trends in Cognitive Science</i> , 17, 13-19, doi: http://dx.doi.org/10.1016/j.tics.2012.11.004 2. Siegler, R. S., & Lortie-Forgues, H. (in press) . Conceptual knowledge of fraction arithmetic. <i>Journal of Educational Psychology</i>	
11-17-16	Improving Mathematical Problem Solving in Grades 4 through 8, Part 1, pp 1-22 LINK: http://www.ies.ed.gov/ncee/wWc/PracticeGuide.aspx?sid=16	
11-22-16	Improving Mathematical Problem Solving in Grades 4 through 8, Part 2, pp 23-46	
11-24-16	No Class	Thanksgiving Break
11-29-16	Improving Mathematical Problem Solving in Grades 4 through 8, Part 3 Readings: 1. Dowker, A. (1992) . Computational estimation strategies of professional mathematicians. <i>Journal for Research in Mathematics Education</i> , 23(1), 45–55 2. Ainsworth, S., Wood, D., & O'Malley, C. (1998) . There is more than one way to solve a problem: Evaluating a learning environment that supports the develop-ment of children’s multiplication skills. <i>Learning and Instruction</i> , 8(2), 141–157.	
12-01-16	Assisting Students Struggling with Mathematics, Part 1, pp 1-25-47 LINK: http://www.ies.ed.gov/ncee/wWc/PracticeGuide.aspx?sid=2	
12-06-16	Assisting Students Struggling with Mathematics, Part 2 Readings: 1. Geary, D. C. (2013) . Early foundations for mathematics learning and their relations to learning disabilities. <i>Current Directions in Psychological Science</i> , 22(1), 23-27 2. Fuchs, L. S., Fuchs, D., & Hollenbeck, K. N. (2007) . Extending responsiveness to intervention to mathematics at first and third grades. <i>Learning Disabilities Research & Practice</i> , 22(1), 13–24	
12-08-16	Paper Due; Final Exam -- Psychology Dept Computer Cluster, BH 332P	
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