

EDPSY 581A: Seminar on Psychology of Math

Fall 2016: Thu 1:30-3:50p, Miller 320

Class Website: <https://canvas.uw.edu/courses/1064651>



Instructor: Dr. Liz Sanders

Email: lizz@uw.edu (email is the best way to communicate)

Office Hours: Miller 312 #G by appointment (mailbox located to the right of front office)

Electronics:

To form an optimal learning atmosphere for all, **laptops/pads/cell phones/recording devices should be turned off/silent and put away** during class discussion time. This said, e-reader devices/laptops may be used during group article reviews/presentations.

Required Text:

Dehaene, S. (2011). *The Number Sense: How the Mind Creates Mathematics*. New York, NY: Oxford University Press. Approximately \$25 from the UW bookstore or online.

Overview:

This course is designed to explore the literature on research on psychology of mathematical thinking and learning. We will be most concerned with **how humans naturally develop mathematical thinking** in terms of mind-brain maturation processes and individuals' interactions with their environments. We will begin with the foundational stage theory work of Jean Piaget (developmental psychologist) to provide a framework for understanding our subsequent readings. We will then read about research on animal studies, early childhood, and cross-cultural studies to better understand domain-specific mathematical thinking (e.g., number sense, measurement, operations, and spatial reasoning) as well as the role of global processes on mathematical thinking (e.g., working memory). We will also touch on math disabilities and cultural influences on our math thinking. Please note that *we will not be covering formal (in-school) math education* – however, math teaching practices can be a topic of choice for your class project.

Each week there will be 3-6 readings from our text or library articles (article links/PDFs posted on the class website or handed out in class), along with a list of focus questions to guide your readings for the following week's discussion. Please note that the readings are by no means comprehensive; rather, the primary goal for this course is for you to build a foundation as a jumping off point for your own topical study. Across our readings, we will examine studies that have used a variety of research methods for testing scientific hypotheses and building scientific theory, including observational, ethnographic, experimental, and correlational paradigms. As such, *Edpsy 490 (or equivalent basic statistics coursework) is required*, and I will provide scaffolding as needed for articles that employ sophisticated statistical approaches. Our topic schedule is as follows—and note: *class discussions will be led by you, the students!*

EDPSY 581 Psych of Math Seminar Fall 2016 Schedule

Day	Topic + Assignments
Week1: Sep 29	Introduction & Piaget's Developmental Stage Theory
Week2: Oct 06	Piaget & Number Sense/Measurement (Group 1)
Week3: Oct 13	Number Sense/Measurement & Number Line (Group 2)
Week4: Oct 20	Arithmetic & Underlying Cognitive Processes (Group 3)
Week5: Oct 27	Fractions/Relational Thinking I (Group 1)
Week6: Nov 03	Fractions/Relational Thinking II (Group 2) select broad topic
Week7: Nov 10	Math Disabilities I (Group 3) <i>(with guest: Dr. Katie Lewis)</i> turn in narrow topic & citations
Week8: Nov 17	Math Disabilities II (Group 3) submit draft paper
Week9: Nov 24	No class – holiday (complete 2 peer-reviews/work on your own paper)
Week10: Dec 01	Anxiety/Stereotype Threat/Motivation (Role of Affect) (Groups 1 & 2) return 2 peer reviews
Week11: Dec 08	Final Presentations/Potluck turn in final paper/presentations

Performance Evaluation

This is a credit/no credit class. The overall course structure involves reading articles, assisting in presenting on readings for alternating weeks of our topics, actively participating in class discussions, pre-writing a draft paper on a literature review topic of your choice (that extends the class readings), completing two peer reviews, writing a final draft of your paper, and presenting your project topic in an informal 10 minute presentation to the class on the last day. Passing credit will be given to individuals who satisfactorily complete all assignments and participate in each seminar session. Note: "satisfactorily" is defined as a high-quality (thoughtful/graduate-level) response to each assignment. All written assignments should be written in APA style (see note below).

- 1. Attendance & Participation** Attendance, in concert with readings, is an important feature of our learning process. In addition to simply attending class, your involvement in class discussions is required. **Absence Make-ups:** If you know you will need to miss a class, let us know via email and we will provide a make-up attendance assignment for you after you return; this will typically be either synthesizing the readings for the day missed and/or doing an additional reading on the topic under discussion. Because we only meet once per week and there is a holiday on one of our weeks, only one (made-up) absence is permitted to receive credit for this course; please plan accordingly. Make-ups must be submitted by **Dec 8** for credit.
 - At the beginning of the course we will form small groups of 2-3 students each. Each group will be responsible for presenting for alternating weeks of the class readings (i.e., teach/guide us through the readings). You may use overheads, PowerPoint, and exercises as tools to guide us through the readings.
- 2. Final Project Paper & Presentation** Your class project will involve multiple components as follows.
 - **Select a topic** for additional inquiry; be prepared to tell us your topic by **Nov 3**. The topic should be focused on research in a specific area of mathematical thinking/learning (i.e., do not be *too* broad). For example, you may be interested in whether second-language middle school children process algebraic problems similarly to their native-speaking peers. As another example, might be examining the gender or race gap in math performance research for different age groups or comparative test measures.
 - **Locate at least 5-10 additional research studies** on topic from peer-reviewed journals by **Nov 10**. Turn in your specific topic area and list of citations. The UW's library system (<http://www.lib.washington.edu/>) has several databases to use to do keyword searches on your topic area. I recommend *PsycInfo*, *Education Source*, and *JSTOR* as good search engines.
 - **Write a draft paper** in APA format to **submit online** by start of class on **Nov 17**. Paper should be (a) a synthesis of research on the topic (this is not simply a summary of disembodied research studies but rather an integration of ideas/theories/evidence across multiple research studies), and (b) one or more specific recommendations for future research based on gaps in the research area (this can actually be a proposal for a realistic study if desired). The final paper should be 10 to 15 pages in length; this draft is to be 5 to 10 pages in length.
 - **Conduct peer reviews of 2 classmates' papers.** This involves writing up 1-3 paragraphs of suggested edits. Only constructive criticism (i.e., how the paper might be 'improved' – not what they are doing 'wrong') about content, organization, writing conventions, and APA style. Return peer reviews by **Dec 1**.
 - **Revise your paper** based on peer reviews, additional readings, and your own revision process. Turn in your final paper and your original paper by **Dec 8** and be prepared to give an informal presentation (overheads/PowerPoint) on your topic that day.

APA Writing Style

APA style includes 1-inch margins, indented paragraphs, double-spacing, 12-point font (Times New Roman, Garamond, Arial, or Calibri preferred). You can purchase the manual: <http://www.apa.org/pubs/books/>, or for general formatting tips, go to Purdue University's Online Writing Lab (OWL) at: <https://owl.english.purdue.edu/owl/resource/560/01/>

Avoiding Plagiarism/Copying

Written work submitted in this course must be your own original effort. When you use the words or ideas of anyone else's work (including ideas from internet websites), you must provide citations and quotes. For more information please see: <http://education.uw.edu/my-coe/current-students/academic-policies>.

Students with Disabilities

If you need accommodations for a disability, contact UW Disability Resources for Students at 206-543-8924 or uwdrs@uw.edu (web: <http://depts.washington.edu/uwdrs>) to propose an educational plan and obtain a letter about the plan. Bring the letter to me, and we will privately discuss arrangements for accommodations.