

Syllabus

S032A1/A2: Accumulating Evidence: How to Conduct a Quantitative Research Synthesis that Informs Educational Policy and Practice

Harvard Graduate School of Education

Course Website: <https://canvas.harvard.edu/courses/18968>

Fall 2016: Tuesdays 8:30-11:30am

(Longfellow 207)

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Course Description and Goals

The goal of this course is to prepare you to conduct a quantitative research synthesis using a powerful methodological tool called meta-analysis. In a seminal article published in 1976 in *Educational Researcher*, Gene Glass defined meta-analysis (i.e., “an analysis of analyses) as the “statistical analysis of a large collection of analysis results from individual studies for the purpose of integrating findings” (p. 3). Because meta-analysis is a statistical method, I will assume that you have taken a course on regression analysis and understand the foundational principles of sampling, inference, and hypothesis testing. S32A1/A2 is an applied methods course. As such, I will emphasize conceptual understanding of statistical models rather than mathematical theory. S32 is designed as a 2 module course; you must take module 1 to enroll in module 2.

Module 1 Goals (S32A1)

In module 1, students will learn a practical step-by-step approach to conducting a quantitative synthesis using meta-analysis. Students will learn how to formulate a question, organize a review strategy, articulate inclusion criteria for finding primary studies, create a coding sheet for evaluating study characteristics, compute an appropriate effect size, create a meta-analytic database, and use Excel and STATA to combine results from primary studies. At the end of S32A1, you will be able to:

1. Understand the role of meta-analysis in building evidence-based recommendations in the social, behavioral, and education sciences.
2. Compute effect sizes from primary studies and pool the results using appropriate statistical models.
3. Critique and re-analyze a published meta-analysis using Excel or Stata

Module 2 Goals (S32A2)

In module 2, students will learn how to carry out an independent project in their primary area of interest and research specialization. Students will learn how to fit fixed- and random-effects model to data, model heterogeneity across studies, create complex data sets involving multiple outcomes, and organize and present findings for a broader audience of researchers and policymakers. For the final assignment, you will craft a project where you demonstrate your ability to contribute to scientific knowledge as a producer of an original review/synthesis. Ideally, your independent project will help catalyze your (and possibly your collaborators) program of research as a junior career scholar. At the end of S32A2, you will be able to:

1. Organize a step-by-step proposal for carrying out a meta-analysis.
2. Use Excel and/or Stata to generate reproducible data sets, analyses, and results.
3. Complete an independent paper that includes the core components of a meta-analysis

Prerequisites and Target Audience

You should have successfully completed a course (e.g., S30, S40, or equivalent) that covers the foundational principles of inference, hypothesis testing, and regression analysis. Bear in mind that this course is designed for (a) current doctoral students and (b) masters students who are likely to pursue doctoral studies and are interested in launching an independent program of research.

Students must have a serious and deep interest in learning how to organize an independent project that uses meta-analysis. You must be cognitively, emotionally, and behaviorally engaged to benefit from this course. ***In short, you must have a passion for your topic to do well in this course.***

If you are a doctoral student thinking about your dissertation, this course will help you learn how to conduct an original quantitative synthesis that contributes to the scientific literature. You should complete a solid draft of a study that could be presented at conference and submitted to a peer-reviewed journal. In previous years, students have started projects that have led to publications in the *Review of Educational Research*, qualifying papers, and conference presentations.

My Philosophy of Teaching

I embrace a “learning by doing” philosophy of teaching.

1. I will use examples from my research program and the Kim and Quinn (2013) meta-analysis to teach you how to implement each step of meta-analysis.
2. I will use data from my meta-analysis and other published studies to help you understand and apply each step.
3. I will gradually release responsibility to you for undertaking an independent project that demonstrates your mastery of each step.

Throughout the course, I will focus on conceptual understanding and practical application using data from a variety of disciplines, topic areas, and published papers.

Academic Integrity

Read and adhere to the Harvard Graduate School of Education's policy on plagiarism and academic integrity: "All work submitted to meet course requirements is expected to be the student's own. In the preparation of all papers and other written work submitted to meet course requirements and dissertations, a student must be careful to distinguish between ideas that are his or her own and those that have been derived from other sources. Information and opinions drawn from all sources are to be attributed specifically to these sources. It is the student's responsibility to learn and use the proper forms of citation. Quotations must be properly placed within quotation marks and must be fully cited. All paraphrased material must also be fully cited. In all cases where ideas or material presented are derived from a student's reading and research, the source used must be indicated. **Students who submit work either not their own or without clear attribution to the original source, for whatever reason, face sanctions up to and including dismissal and expulsion.**"

Key Textbooks, Articles, Course Materials

Key Methods Textbook (Required Readings)

- Borenstein, M., Hedges, L. V., Higgins, J. P. T., Rothstein, H. R. (2009). *Introduction to Meta-Analysis*. West Sussex, UK: John Wiley & Sons, Lt. Download from <http://onlinelibrary.wiley.com.ezp-prod1.hul.harvard.edu/book/10.1002/9780470743386>

Other Methods Textbooks (Optional/Recommended Readings)

- Cooper, H., Hedges, L. V., & Valentine, J. C. (2009). *The Handbook of Research Synthesis, 2nd Edition*. New York: Russell Sage Foundation.

Published Articles and Book Chapters Focused on Foundational Methods

I refer to these by last name and date in the course outline. Most of the articles are available through (or Canvas e-resources tab) Harvard Libraries' E-Resources. Note the articles in iPa©. I will list them again under the weekly calendar.

- APA's Meta-Analytic Reporting Standards (MARS): <http://www.apastyle.org/manual/related/JARS-MARS.pdf>
- What Works Clearinghouse (WWC) Procedures and Standards Handbook Version 3.0: http://ies.ed.gov/ncee/wwc/pdf/reference_resources/wwc_procedures_v3_0_standards_handbook.pdf
- WWC Review Protocol for Foundational Reading Practice Guide Version 3.0: http://ies.ed.gov/ncee/wwc/pdf/reference_resources/wwc_fr_pg_protocol_v3.pdf
- WWC Review of Individual Studies Protocol Version 3.0: http://ies.ed.gov/ncee/wwc/pdf/reference_resources/wwc_ris_protocol_v3.pdf
- Bus, A. G., van Ijzendoorn, M. H., & Mol, S. E. (2011). Meta-Analysis (pp. 270-300). In N. K. Duke & M. H. Mallette (Eds.) *Literacy Research Methodologies* (2nd ed). (iPa©)
- Cooper, H. M. (2009). Hypotheses and problems in research synthesis *The Handbook of Research Synthesis and Meta-analysis, 2nd Ed.*, pp. 19-35. (iPa©)
- Liberati, A., Altman, D. G., Tetzlaff, J., Mulrow, C., Gøtzsche, P. C., Ioannidis, J. P., ... & Moher, D. (2009). The PRISMA statement for reporting systematic reviews and meta-

analyses of studies that evaluate health care interventions: explanation and elaboration. *Annals of internal medicine*, 151(4), W65-W94.

- Mohr et al. (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement, *PLOS Medicine*, vol. 6, no. 7.
- Reed, J.G., & Baxter, P.M. (2009) Using Reference Databases. In Cooper, H., & Hedges, L., & Valentine, J.C. Ed. *The Handbook of Research Synthesis and Meta-analysis*, 2nd. Ed., pp. 73-102. (iPa©)
- Sampson M, McGowan J, Cogo E, Grimshaw J, Moher D, Lefebvre C. 2009. An evidence-based practice guideline for the peer review of electronic search strategies. *Journal of Clinical Epidemiology* 62(9): 944–952.
- Valentine, J. C., & Cooper, H. (2008). A systematic and transparent approach for assessing the methodological quality of intervention effectiveness research: The study design and implementation assessment device (study DIAD). *Psychological Methods*, 13, 330–349.
- Wilson, D.B. (2009) Systematic Coding. In Cooper, H., & Hedges, L., & Valentine, J.C. Ed. *The Handbook of Research Synthesis and Meta-analysis*, 2nd. Ed., pp. 159-176 (iPa©)

Published Meta-analyses

I will use these studies to prepare you to conduct a meta-analysis, as part of the replication activities and the independent projects you will prepare. All of the articles are available through Harvard Libraries' E-Resources.

- Betts, J. R., & Tang, Y. E. (2011). The effect of charter schools on student achievement. Read pp. 16-29. Available from: http://www.crpe.org/sites/default/files/pub_NCSRP_BettsTang_Oct11_0.pdf
- Cooper, H. (2007). Evaluating and interpreting research syntheses in adult learning and literacy. Available from: http://www.ncsall.net/fileadmin/resources/research/op_research_syntheses.pdf
- Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: A meta-analysis of school-based universal interventions. *Child Development*, 82(1), 405-432.
- Gershoff, E. T., & Grogan-Kaylor, A. (2016, April 7). Spanking and Child Outcomes: Old Controversies and New Meta-Analyses. *Journal of Family Psychology*. Advance online publication. <http://dx.doi.org/10.1037/fam0000191>
- Kim, J. S., & Quinn, D. M. (2013). The effects of summer reading on low-income children's literacy achievement from Kindergarten to Grade 8: A meta-analysis of classroom and home interventions, *Review of Educational Research*, 83(3), pp. 386-431.
- Lipsey, M. W., & Wilson, D. B. (1993). The Efficacy of Psychological, Educational, and Behavioral Treatment, Confirmation from Meta-analysis. *American Psychologist*, 48,(12), pp. 1181-1209.
- Majewicz-Heflrey, A. & Carlson, J. S. (2007). A meta-analysis of combined treatments for children diagnosed with ADD, *Journal of Attention Disorders*, 10, 239-250.
- National Institute for Literacy. (2007). *The Effect of Family Literacy Interventions on Children's Acquisition of Reading*. Portsmouth, NJ: RMC Research Corporation.

- Sénéchal, M., & Young, L. (2008). The effect of family literacy interventions on children's acquisition of reading from kindergarten to grade 3: A meta-analytic review. *Review of Educational Research*, 78, 880-907.
- Strong et al., (2011). A systematic meta-analytic review for the effectiveness of the Fast ForWord language intervention program, *Journal of Child Psychology and Psychiatry*, 52, 224-235.

Software

We will use Excel and Stata in this course. I assume everyone has Excel on their computers. You will need Intercooled Stata (Stata/IC) or higher. Stata is available in the HGSE computer lab. There is meta-analysis specific software such as Comprehensive Meta-Analysis (CMA). If you plan to use meta-analysis throughout your research career, you may want to purchase an individual student license at https://www.meta-analysis.com/pages/student_rates.php

Course Handouts

I will post powerpoint slides (plus supplemental handouts) by 8pm Monday, before the Tuesday class. These materials are not a substitute for class and you are expected to attend every class.

Module 1 Assignments

Students are required to attend all classes and participate in discussions, to complete all assigned readings and the 3 exercises BEFORE class. All assignments are due in class and no student work will be accepted via fax. This course can be taken for a grade or pass / fail. Successful completion of S32 depends on:

(20%) Class Participation

Class participation is based on (1) attending all six classes, and (2) short memos in response to weekly readings. The memos will serve as your notes for class discussion. When you participate in the class discussion about readings, be sure to provide your thoughts on at least one (E) Evaluation question that was assigned with the readings. **A good answer to an (E)valuation question will state the plus and minus of 2 ideas and then offer an evaluation of the better idea.**

(80%) Exercises: There are three required exercises. Details on each exercise and the weekly questions under the "Assignments" tab:

1. **Due September 13:** (10%) problem formulation exercise.
2. **Due September 27:** (20%) effect size computation exercise using Excel.
3. **Due October 25:** (50%) a final project in which you re-analyze a published meta-analysis.

Module 2 Assignments

(20%) Class Participation – same as module 1

(80%) Final Paper/Project

Going through all of the steps to conduct a comprehensive, rigorous meta-analysis is a large undertaking. In many cases, the process will require more than one semester's worth of work. To help you make progress toward completing a meta-analysis for a conference or journal, you will work on an independent project. **Yes, you may collaborate with another student on this project.**

Major Requirements: Independent Study Proposal, Class Presentation, Final Paper (Details in the "Assignments" tab)

1. **Due Monday October 24 @ 6pm – upload your independent study form to Canvas and sign up for a 1-1 meeting on October 25 (wiki sign-ups from 8:30-11:30am, and 2-4pm).** I will not hold class on this day and will ask you to sign up for a 20 or 40 minute block of time to discuss your project goals and emerging questions.
2. **Due November 22** – Prepare a 10-15 class presentation to share your preliminary paper/project and receive feedback from instructor and peers.
3. **Due (Monday) December 12 @ 5pm – Submit a 12-15 page final paper.** This final paper should include each major step of a meta-analysis.

Weekly Schedule: Module 1 (confirmed) and Module 2 maybe adjusted depending on students' research interests

Date	Topic	Outline for Lecture, Discussion, Activities	Readings (Required and Recommended) and Exercises
Module 1			
Sept. 6	1. Role of meta-analysis in science	<p>Lecture and Discussion</p> <ul style="list-style-type: none"> Review history of meta-analysis and its role in science today <p>Activity</p> <ul style="list-style-type: none"> Discuss BHHR and BVM questions in large and small groups 	<p>Required Readings</p> <ul style="list-style-type: none"> (BHHR) Borenstein, M., Hedges, L. V., Higgins, J. P. T., Rothstein, H. R. (2009). When does it make sense to perform a meta-analysis. Chapter 40, pp. 357-364. (BVM) Bus, A. G., van Ijzendoorn, M. H., & Mol, S. E. (2011). Meta-Analysis, pp. 270-300. In N. K. Duke & M. H. Mallette (Eds.) <i>Literacy Research Methodologists</i> (2nd ed).
Sept. 13	2. Hypothesis Formulation	<p>Lecture and Discussion</p> <ul style="list-style-type: none"> Discuss family of effect sizes commonly used in meta-analysis: d, r, OR (odds ratios) <p>Activity</p> <ul style="list-style-type: none"> I will describe my process for hypothesis formulation from 2011-2013 (peer reviewed) Discuss hypothesis formulation and the development of precise and relevant hypotheses 	<p>Required Readings</p> <ul style="list-style-type: none"> Due Exercise #1 on Hypothesis Formulation Kim, J. S., & Quinn, D. M. (2013). The effects of summer reading on low-income children's literacy achievement from Kindergarten to Grade 8: A meta-analysis of classroom and home interventions, <i>Review of Educational Research</i>, 83(3), 386-431. Kim, J. S. (2006). Effects of a voluntary summer reading intervention on reading achievement: Results from a randomized field trial. <i>Educational Evaluation and Policy Analysis</i>, 28, 335-355. Allington, R. L., McGill-Franzen, A., Camilli, G., Williams, L., Graff, J., Zeig, J., & Nowak, R. (2010). Addressing summer reading setback among economically disadvantaged elementary students. <i>Reading Psychology</i>, 31, 411-427. <p>Recommended Reading</p> <ul style="list-style-type: none"> Cooper, H. M. (2009). Hypotheses and problems in research synthesis <i>The Handbook of Research Synthesis and Meta-analysis</i>, 2nd Ed., pp. 19-35. (iPa©) Cooper, H. (2007). Evaluating and interpreting research syntheses in adult learning and literacy. http://www.ncsall.net/fileadmin/resources/research/op_research_syntheses.pdf
Sept. 20	3. Retrieval and Coding of Studies	<p>Lecture and Discussion</p> <ul style="list-style-type: none"> Procedures for retrieving studies A concrete illustration of retrieving studies from Kim & Quinn (2013) <p>Activity</p> <ul style="list-style-type: none"> Code Schater & Jo (2005) and discuss questions about coding studies 	<p>Required Readings</p> <ul style="list-style-type: none"> Kim & Quinn (2013) – Re-read the methods on pp. 391-395 (section on retrieval and coding of studies) 1e-codebook.docx 1f-coded_data.xlsx Mohr et al. (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement, <i>PLOS Medicine</i>, vol. 6, no. 7. Prepare answers to questions week 3 readings. NB – There are several recommended readings on retrieving and coding data

			<p>below:</p> <p>Recommended Readings</p> <ul style="list-style-type: none"> • Liberati, A., Altman, D. G., Tetzlaff, J., Mulrow, C., Gøtzsche, P. C., Ioannidis, J. P., ... & Moher, D. (2009). The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: explanation and elaboration. <i>Annals of internal medicine</i>, 151(4), W65-W94. • Reed, J.G., & Baxter, P.M. (2009) Using Reference Databases. In Cooper, H., & Hedges, L., & Valentine, J.C. Ed. <i>The Handbook of Research Synthesis and Meta-analysis</i>, 2nd. Ed., pp. 73-102. (iPa©) • Sampson M, McGowan J, Cogo E, Grimshaw J, Moher D, Lefebvre C. 2009. An evidence-based practice guideline for the peer review of electronic search strategies. <i>Journal of Clinical Epidemiology</i> 62(9): 944–952. • Valentine, J. C., & Cooper, H. (2008). A systematic and transparent approach for assessing the methodological quality of intervention effectiveness research: The study design and implementation assessment device (study DIAD). <i>Psychological Methods</i>, 13, 330–349. • Wilson, D.B. (2009) Systematic Coding. In Cooper, H., & Hedges, L., & Valentine, J.C. Ed. <i>The Handbook of Research Synthesis and Meta-analysis</i>, 2nd. Ed., pp. 159-176 (iPa©)
Sept. 27	4. Analysis of Study Results (Fixed-Effect and Random Effects Model)	<p>Lecture and Discussion</p> <ul style="list-style-type: none"> • Review Kim & Quinn coding sheet • Review excel file with codes • Discuss coding for methods and quality (Campbell & Stanley, WWC) <p>Activity</p> <ul style="list-style-type: none"> • Excel – FE model (begin RE model) 	<p>Required Readings</p> <ul style="list-style-type: none"> • Due Exercise #2 on Effect Size Coding • Borenstein Chp. 3-7 (pp. 17-50) to compute effect sizes from primary studies
Oct. 4	5. Analysis of Study Results (Fixed-Effect and Random Effects Model)	<p>Lecture and Discussion</p> <ul style="list-style-type: none"> • Describe fixed and random effect model using Kim & Quinn (2013) <p>Activity</p> <ul style="list-style-type: none"> • Excel – RE models • Discuss readings 	<p>Required Readings</p> <ul style="list-style-type: none"> • Borenstein Chp. 10-13 (pp. 61-86) • Pick 1 meta-analysis below. Read the entire paper, and pay careful attention to the methods and results. Be prepared to explain how the authors computed the ES and the type of statistical they used. • (1) Betts, J. R., & Tang, Y. E. (2011). The effect of charter schools on student achievement. Available from: http://www.crpe.org/sites/default/files/pub_NCSRP_BettsTang_Oct11_0.pdf • (2) Gershoff, E. T., & Grogan-Kaylor, A. (2016, April 7). Spanking and Child Outcomes: Old Controversies and New Meta-Analyses. <i>Journal of Family Psychology</i>. Advance online publication. http://dx.doi.org/10.1037/fam0000191

			<ul style="list-style-type: none"> (3) Greene, J. P. (1998). A meta-analysis of the effectiveness of bilingual education. Tomas Rivera Policy Institute. Available from: http://www.uark.edu/ua/der/People/Greene/Meta_Analysis_Bilingual_Education.pdf (4) Majewicz-Heflrey, A. & Carlson, J. S. (2007). A meta-analysis of combined treatments for children diagnosed with ADD, <i>Journal of Attention Disorders</i>, 10, 239-250. (5) Strong et al., (2011). A systematic meta-analytic review for the effectiveness of the Fast ForWord language intervention program, <i>Journal of Child Psychology and Psychiatry</i>, 52, 224-235.
Oct. 11	6. Modeling heterogeneity; Interpreting evidence	<p>Lecture and Discussion</p> <ul style="list-style-type: none"> Continue FE and RE models Discuss interpretation of evidence <p>Activity</p> <ul style="list-style-type: none"> Preparations for final exercise #3 and module 2 	<p>Required Readings</p> <ul style="list-style-type: none"> Lipsey, M. W., & Wilson, D. B. (1993). The Efficacy of Psychological, Educational, and Behavioral Treatment, Confirmation from Meta-analysis. <i>American Psychologist</i>, 48,(12), pp. 1181-1209. National Institute for Literacy. (2007). <i>The Effect of Family Literacy Interventions on Children's Acquisition of Reading</i>. Portsmouth, NJ: RMC Research Corporation. Sénéchal, M., & Young, L. (2008). The effect of family literacy interventions on children's acquisition of reading from kindergarten to grade 3: A meta-analytic review. <i>Review of Educational Research</i>, 78, 880-907.
Module 2			
Oct. 11	7. Moderator / Heterogeneity Analysis cont.	<p>Lecture and Discussion</p> <ul style="list-style-type: none"> Methods and examples of heterogeneity analyses Discuss independent project goals <p>Activity</p> <ul style="list-style-type: none"> Model heterogeneity and replicating analyses in Stata (Kim & Quinn, 2013 replication files) Discuss JK drafts and reviews of RER 	<p>Required Readings</p> <ul style="list-style-type: none"> Borenstein et al. (2009), Chps. 15-16, 19 Peer review comments for RER and my replies to reviewers Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: A meta-analysis of school-based universal interventions. <i>Child development</i>,82(1), 405-432
Oct. 18	8. Moderator / Heterogeneity continued	<p>Lecture and Discussion</p> <ul style="list-style-type: none"> Discuss mixed effects models using samples from Pigott <p>Activity</p> <ul style="list-style-type: none"> Sample data sets using meta-regression: Sirin (2005), Raudenbush (1985) 	<p>Required readings</p> <ul style="list-style-type: none"> <u>Due "Independent Study Proposal" and sign up for a 20 to 40 minute session on Tuesday October 25 at 8:30-11:30am or 2-4pm to discuss proposal</u>

Oct. 25	9. Independent Study Proposal (1-1 meetings)	<ul style="list-style-type: none"> Submit study goals for module 2 and what you plan on presenting on nov. 22 in class Study goals 	<p>Required readings</p> <ul style="list-style-type: none"> Complete the “Independent Study Proposal” and sign up for a 20 to 40 minute session on Tuesday October 25 at 8:30-11:30am or 2-4pm
Nov. 1	10. Complex data structures	<p>Lecture and Discussion</p> <ul style="list-style-type: none"> Subgroups, multiple time points <p>Activity</p> <ul style="list-style-type: none"> Review STATA replication files for Kim & Quinn Add 2 new studies from 2016 and create STATA reproducible files that update the study results 	<p>Required Readings</p> <ul style="list-style-type: none"> Borenstein et al., (2009), Chps., 22-26, pp. 215-248
Nov. 8	11. Sensitivity Analyses	<p>Lecture and Discussion</p> <ul style="list-style-type: none"> Kim & Quinn (2013) examples - power, publication bias <p>Activity</p> <ul style="list-style-type: none"> Apply different methods for assessing publication bias, power (e.g., OD, STATA software) 	<p>Required Readings</p> <ul style="list-style-type: none"> Borenstein, chp. 29-30, pp. 257-294
Nov. 15	12. Special Topics that Address Student Needs (e.g., Mediation meta-analysis)	<p>Lecture and Discussion</p> <ul style="list-style-type: none"> Discuss sample papers that use methods addressing student topics Papers-TBD depending on students’ final project goals/interests 	<p>Required Readings</p> <ul style="list-style-type: none"> Progress on Independent project Possible readings and topics might include mediational analysis: Shadish (1996) – Psychological Methods, Harris & Rosenthal (1985) Psychological Bulletin
Nov. 22	13. Student Presentations	<p>Activity</p> <ul style="list-style-type: none"> Give a 10-12 minute PPT talk of your project and get feedback 	<p>Required Readings</p> <ul style="list-style-type: none"> Due Final Presentation of Independent Project
Nov. 29-30	14. Sign up 1-1 meetings to discuss next steps on your project	<p>Sign up 1-1 meetings to discuss next steps on your project; I will set up a wiki for office hours to have one final check-in on your goals after S32</p>	<p>Required Readings</p> <ul style="list-style-type: none"> Continue final paper
Dec. 12 @ 5pm	Final paper	<p>Upload your final paper and analysis files (i.e., STATA data / do files or Excel files) to the Canvas website.</p>	<p>Required Readings</p> <ul style="list-style-type: none"> Due Final Paper See final paper guidelines under Assignments