National Numeracy Network Fall 2012 Conference Schedule Abstracts

Quantitative Literacy at Work: Navigating the Worlds of Journalism, Finance, Business, and Citizenship

8:30	*Quantway™ - A Quantitative Reasoning Alternative for Developmental Math Students* **Amy Getz**, Dana Center at U.T. Austin **Cinnamon Hillyard**, Carnegie Foundation for the Advancement of Teaching **Stuart Boersma**, Central Washington University **Yevgeniy Milman**, Borough of Manhattan Community College **Michael George**, Borough of Manhattan Community College Learn about Quantway, an innovative quantitative reasoning developmental mathematics course developed in partnership by the Carnegie Foundation for the Advancement of Teaching and the Dana Center at U.T. Austin. This course offers a rigorous quantitative reasoning alternative to the traditional algebra sequence incorporating relevant mathematical content and authentic contexts students need for their academic goals and in everyday life. Participants will learn about Quantway's learning outcomes, instructional design, and development process and be given an opportunity to explore the materials. Quantway faculty will share their experiences from their initial pilot year. Amy Getz, Program Coordinator, Higher Education Team, Dana Center at U.T. Austin Jane Muhich, Managing Director for Community College Program Development; Director, Productive Persistence, Carnegie Foundation for the Advancement of Teaching Cinnamon Hillyard, Director, Quantway, Carnegie Foundation for the Advancement of Teaching Stuart Boersma, Professor of Mathematics at Central Washington University Prof. Yevgeniy Milman, Developmental Program Coordinator, Borough of Manhattan Community College Dr. Michael George, Assistant Professor, Mathematics, Borough of Manhattan Community College
	Strengthening and Reinforcing Quantitative Reasoning Skills in Biology Courses at a Large Urban Community College: Challenges and Achievements **Laura C. Broughton** **Rebeca Araya** **Kyeng Lee** **Carlos Liachovitzky,** Bronx Community College/CUNY Quantitative reasoning skills are essential life tools for our increasingly technological society; however, a significant number of citizens have deficiencies in mathematics and reasoning skills. Bronx Community College is a typical urban community college with an open enrollment policy. Many of our students come to us ill prepared to face introductory college courses. Over the course of 3 semesters, faculty from the Biology Department focused their efforts on integrating and reinforcing quantitative reasoning skills in three different introductory courses that are taught by more than one professor and have multiple sections. Through this initiative, we strove to identify the most important quantitative skills for each course, introduce those skills, and reinforce them over the course of the semester using targeted activities, in an effort to be more systematic in our approach to quantitative literacy. By selecting only one or two quantitative skills per class, we planned to reinforce those skills repeatedly throughout the semester through different activities matched with different topics. Assessment was done by administering identical pre- and post- tests to evaluate: A) students' self-confidence in performing the targeted skills, and B) accuracy in performing the targeted skills. In all 3 courses, students were consistently overconfident. We saw minor improvements in probability skills in one course (Introductory General Biology II) and graph interpretation skills in the other two courses (Introductory General Biology I and Anatomy & Physiology I) with the implementation of quantitative modules. We determined that the key to getting faculty to participate is integration of quantitative activities and assessments into the overall course structure, and maximizing the ease of implementation of both activities and assessment tools. Finally, the key to getting students to participate is integration of quantitative activities and assessments into the overall course structure & attaching a grade of some sort to the activities. Laura C. Broughton, Associate Professor Rebeca Araya, Lecturer Kyeng Lee, Associate Professor Carlos Liachovitzky, Lecturer

	Dr. Laura C. Broughton, email: laura.broughton@bcc.cuny.edu, work phone: 718-289-5522
	Numeracy and Personal Health **Jessica S Ancker**, Cornell University Quantitative literacy has a measurable relationship with not only informed citizenship but also personal health. This presentation will review the evidence linking low numeracy with worse health outcomes and medical decision-making and present two theoretical models that attempt to explain the relationship. In addition, it will present an exciting body of work demonstrating how innovative information presentation can improve quantitative reasoning, even among patients who perform poorly on numeracy assessments. The session will cover a series of experiments demonstrating how interactive visual illustrations alter risk perception and comprehension among low-numeracy patients to bring their perceptions and decisions closer to those of high-numeracy patients. Although improved education on quantitative concepts for the public is critical, such innovative information presentations can also serve an important function to improve understanding among those who cannot be reached by current educational initiatives. Jessica S Ancker, MPH, PhD, Assistant Professor, Center for Healthcare Informatics and Policy, Weill Cornell Medical College, New York, NY
9:00	*Numeracy Infusion Course for Higher Education (NICHE)* **Esther Wilder,** Lehman College **Frank Wang,** Laguardia Community College **Dene Hurley,** Lehman College **Elin Waring**, Lehman College NICHE fosters the infusion of QR instruction and assessment into undergraduate courses in a broad range of disciplines. NICHE is a predominantly online course that teaches faculty how to (a) apply Quantitative Literacy/Quantitative Reasoning (QL/QR) within a disciplinary context, (b) articulate QR learning goals/objectives that reflect best practices for teaching quantitative literacy, (c) identify and implement best practices for teaching QR, and (d) assess the effectiveness of QR initiatives and use the assessment results to further improve instruction. Some of the topics covered in NICHE include active learning using data analysis, teaching QR with spreadsheets and graphing, cognitive illusions and their impact on judgments and decisions, collaborative student learning, and writing about numbers. NICHE seeks to not only address students' learning, but also to lessen the QR anxieties and improve the QR competencies of participating faculty. Ultimately, NICHE will serve as a model for QR faculty development that can be easily adapted at a wide range of academic institutions.
	Weighing Positive vs. Negative Factors: A Data Envelopment Analysis Technique **Alexander Vaninsky,** Hostos Community College/CUNY Weighing factors that influence an outcome in opposite ways is an important element of a decision-making process. Data Envelopment Analysis (DEA) compares the factors using a Linear Programming (LP) algorithm that limits its educational applications. In 2009 the author developed a DEA with a Perfect Object (DEA PO) that eliminates the need in LP procedure. Simple Excel formulas are sufficient, and for small models, merely a scientific calculator suffices. This presentation uses DEA PO for finding a team winner of the XXX Olympic Games in London in 2012 and ranking the teams. In this example, a PO is a virtual team that is the smallest in size and representing a country with the lowest population while winning maximum total and gold medals. Such team serves as a benchmark. The presentation demonstrates the details of the calculations and discusses different applications of DEA PO. Alexander Vaninsky D. Sc., Ph.D., Professor Mathematics Department, Hostos Community College of The City University of New York, Email: avaninsky@hostos.cuny.edu Tel.: 718-319-7930
9:30	*Preparing Students for QL at Work: It Starts with Faculty* **Lynette Hoelter**, University of Michigan **Flora McMartin**, Broad-based Knowledge Inc. **George Alter**, University of Michigan

	William Frey, University of Michigan and Brookings Institute In order for students to be able to use quantitative literacy in the worlds of business, journalism, finance, or even in the day-to-day world of being a citizen in a democratic society, they must be comfortable enough with quantitative information that those skills are second nature. To that end, this presentation will discuss summary and evaluative findings from an NSF-funded CCLI project aimed at using Census and other social science data to support quantitative literacy. We address the ways in which faculty in social sciences can be engaged to incorporate quantitative learning into their courses, focusing especially on faculty who teach lower-division courses to maximize the potential impact (because almost all students are required to take at least one such course in their college careers). We posit that using real social data in the classroom allows students to take a more active role in learning substantive course content and provides them a foundation (or reinforcement) of quantitative skills that will be used in their future careers. A select group of faculty were brought together to define quantitative literacy as it relates to social sciences (as opposed to traditional STEM disciplines), create learning objectives from that definition, and use and assess a data-based exercise they had created or modified as part of the project. Many of the learning outcomes specified by the instructors can be directly translated into skills needed for the "worlds" that comprise the theme of the conference: the ability to read and talk about information presented as tables or charts, critical thinking skills related to hypothesis testing and evidence evaluation, and overall confidence working with numbers. Lessons learned about the barriers to working with faculty to include data in their courses will also be shared.
	The Art and Science of Developing Middle School Students' Interest in Thinking with Numbers **Neil Lutsky,** Carleton College How can educators stimulate and strengthen students' appreciation of quantitative reasoning? Experts have highlighted a variety of techniques targeting different educational levels and aspects of quantitative reasoning. For example, Harackiewicz, Rozek, Hulleman, and Hyde (2012) described a successful intervention with parents, evaluated by field experiment, that encouraged high school students to enroll in science and mathematics courses. Madison and Steen (2008) addressed the education of secondary school teachers. Garfield and Ben-Zvi (2008) summarized approaches to developing students' statistical reasoning in college. This presentation will describe a means of engaging middle school students' interest in thinking with numbers through a project completed in an art course. Data documenting the positive impact of the project on student attitudes toward quantitative reasoning will be summarized. Neil Lutsky Professor Psychology Carleton College **nlutsky@carleton.edu**
10:00	*Re-Numeration: Introductory Science for Non-Majors and its Role in Fostering Quantitative Literacy* **Katherine B. Follette**, University of Arizona Instructors of introductory science courses for non-majors often state that our principle goal is to teach students to distinguish between science and pseudoscience, truth and fiction, in their everyday lives. This skill is just one among many aspects of scientific literacy that rely on a solid foundation of quantitative skills, yet introductory science courses for non-majors are heavily populated with the math-phobic and number-adverse. In response to these phobias and a commensurate lack of skill and comfort in dealing with quantitative information, many instructors of introductory science have sterilized their courses – removing numbers, equations, graphs, measurements, etc. This movement toward purely qualitative science is disturbing in the broader context of fostering a literate public. Statistics, graphs, numbers and other forms of quantitative information abound in the media, medicine and consumer industries, politics and many other venues of modern life, and can as easily be used to dupe, mislead or entice as they can to inform. In an increasingly data-driven world, can we expect our students to leave college as savvy voters consumers and citizens if we remove quantitative skills from disciplines where they are absolutely essential for understanding, where students can and should learn to apply mathematics to process information? We argue that introductory science courses for non-majors, which are a degree requirement at many schools, are precisely where we should be working hardest to turn the tide of quantitative illiteracy and math phobia. We report on our efforts (thus far focused in Astronomy, where upwards of 10% of college students eventually take a course) to test the hypothesis that simple everyday quantitative skills can be improved through a semester of science instruction, as well as our efforts to convince the science education community that this is a worthy endeavor.

	Don't chloroform the child's reasoning faculties : A little-known mathematics curriculum based on meaning **Sanjoy Mahajan,** Olin College Almost 90 years ago, a pioneering educator, Louis Benezet, became superintendent of schools in a New England mill town. Finding that the traditional mathematics curriculum was "chloroforming the students reasoning faculties," he designed, implemented, and tested a new mathematics curriculum upending the old. In the early grades, the experimental-classroom students -- mostly the poor sons and daughters of millworkers with English as a second language -- read, invented, and discussed stories and problems; they estimated lengths, heights, and areas; and they enjoyed finding and interpreting numbers relevant to their lives. In grade 6, with only 4 months of formal arithmetic, they caught up to the regular-classroom students in algorithmic ability, and were far ahead in numeracy and in the verbal, semantic, and problem-solving skills that they had practiced for the five preceding years. I will describe the design principles of the curriculum; explain why, with our modern understanding of psychology and neurobiology, the curriculum was so successful; and discuss what it can teach us for today.
10:30	*QR Course Construction Panel* **Carol Overby,** Parsons the New School for Design This 90-minute workshop session will guide participants through sharing of tools and techniques including, but not limited to - Syllabus development, with distribution of shared syllabi - Discussion and sharing of books, readings, and resources - Technical tools for QR/QL classes, such as iPad graphics apps, budgeting calculators, investment games - Examples of manipulation in data visualization - Identification of characteristics of great QR instructors - "Working backward" from job skills and subsequent courses to shape learning outcomes Participants will be contacted in advance with discussion questions and guidelines for bringing materials to share. Although NNN members already share much of this information via email and website, this workshop will offer face-to-face discussions and on-the-spot handling of materials.
	Quantifying Quantitative Reasoning in Writing: Which Courses Do (and Do Not) Predict Student Success **Nathan Grawe,** Carleton College The Quantitative Inquiry, Reasoning, and Knowledge (QuIRK) initiative at Carleton College has developed a rubric for the assessment of quantitative reasoning (QR) in papers written by students across the general education curriculum. This proposal will examine which course taking patterns predict stronger faculty evaluations. Of course, because we do not use random assignment to place students in classes we cannot draw causal conclusions about these patterns. In that sense, it is at least as interesting to note which course patterns do not predict strong QR-in-writing performance and what that might indicate for QR initiatives more broadly. Nathan Grawe Associate Professor of Economics Carleton College ngrawe@carleton.edu, 507-222-5239.
	Quantitative Reasoning and Informed Citizenship: An activity-based course for non-science majors **Alicia Sevilla,** Moravian University **Kay Somers,** Moravian University To be responsible citizens, all college graduates, regardless of their choice of undergraduate major, need to be able to make responsible decisions on fiscal, environmental and health issues that require quantitative reasoning skills. *Quantitative Reasoning and Informed Citizenship* is a college-level quantitative reasoning course in which students analyze real data while building their reasoning and technology skills. The course is activity-based and students use real data as they work on in-class activities that are design to build their numerical, logical, and statistical reasoning skills. Many of the guided activities use Excel and engage students in an analysis of real data or real-life situations. The audience for this course is typically students who have chosen a non-science discipline as their major and who think that mathematics is not relevant for them. Topics addressed in the course include using charts and graphs, linear and exponential functions and logarithms, indexes and ratings, decision-making, inductive and deductive reasoning, basic descriptive statistics, probability and sampling and surveys. These topics are investigated using contexts such as income levels in the United States, environmental issues, credit card debt, and sports data, to name a few. Students also complete several projects

	outside of class; in these projects students typically work on topics of their choice. In this talk we will describe the course and present sample activities with student work. We will also highlight several out-of-class projects that require students to use their Excel skills and allow them to explore topics that are particularly relevant to them. We will describe student outcomes and reactions to the course and activities.
11:00	*Doctors And Quantitative Literacy* **Jessica S Ancker**, Cornell University **Erika Abramson**, Cornell University It is often assumed that poor medical decision-making by patients should be attributed to their own deficits in numeracy or literacy. However, a significant body of evidence suggests that many physicians also suffer from quantitative literacy deficits. These deficits affect at least 3 facets of medical care. First, some medication errors have been traced to simple computational mistakes. Second, many physicians have poor understanding of the types of medical statistics that would help them to interpret medical evidence for treatment decisions or patient counseling. Third, physicians are not trained in how to present quantitative information to their patients in the most comprehensible and easily understandable format. For example, repeated studies conducted in recent decades have demonstrated that patients have a difficult time understanding risks presented in the "1-in-X" format (for example, comparing a 1 in 10,000 risk to a 1 in 5000 risk), and yet clinical geneticists and genetic counselors continue to be trained to present information to patients in this fashion. This session will explore dimensions of numeracy required for clinical medicine, review data about clinician performance on numeracy assessments, and describe training innovations focusing on this issue in the pediatrics department. Jessica S Ancker, MPH, PhD, Assistant Professor, Center for Healthcare Informatics and Policy, Weill Cornell Medical College, New York, NY Erika Abramson, MD, MS, Assistant Professor, Department of Pediatrics and Center for Healthcare Informatics and Policy, Weill Cornell Medical College, New York, NY
	Dartmouth Financial Literacy Materials **Dorothy Wallace,** Dartmouth College **Kim Rheinlander,** Dartmouth College For the last two years the Center for Mathematics and Quantitative Education, together with the Dartmouth Financial Literacy Project, have been creating and testing FL curriculum suitable for college and near-college age adults. This group of adults are getting their first jobs and learning to budget, getting their first credit cards, buying cars, and making early decisions about retirement contributions, insurance, and health care choices. Because of the "miracle of exponential growth", early decisions to save and invest seemingly insignificant amounts of money will have a very big effect on their eventual financial security. We have produced rich curriculum materials on a variety of FL topics that may be integrated with existing courses, particularly quantitative courses. We have produced an entire open source textbook integrating FL with developmental mathematics. We have produced short videos suitable for starting classroom discussions or as part of faculty development workshops. Working with various institutions we have tried out materials with students in quantitative literacy courses at 2 and 4 year colleges, high school teachers engaged in faculty development, as well as soon-to-graduate seniors. Dorothy Wallace Professor of Mathematics dwallace@math.dartmouth.edu 603-6463610 Kim Rheinlander Director emeritus, The Center for Mathematics and Quantitative Education kimr@math.dartmouth.edu
11:30	*A Better Way to Teach Algebra: Spreadsheets and Modeling* **Eric Gaze,** Bowdoin College The July 29, 2012 opinion piece in the New York Times, *Is Algebra Necessary?*, by Andrew Hacker is just the most recent in what has become steady stream of criticisms of the current state of teaching algebra in this country. The furor over this article makes us all aware of how sensitive this issue has become and warrants a considered conversation by the stakeholders who actually teach algebra and mathematics. There are many in the QR community who advocate for **reforming** the existing algebra curriculum, which can be nothing more than formulaic symbol manipulation for our students. In this talk I will address the controversy and put forth one approach to teaching algebra which involves the use of spreadsheet technology and modeling. This approach is based on the QR course I

	have developed and taught over the last decade. Eric Gaze Director of the Quantitative reasoning Program Bowdoin College egaze@bowdoin.edu
	Quantitative Reasoning Progress Report **Donna L. Sundre,** James Madison University **Masahiko Hirano**, SOKA University **Satoshi Sasaki,** SOKA University James Madison University's (JMU) Quantitative Reasoning (QR) efforts have officially gone global. The essence of this presentation will be to report the progress made in QR assessment at JMU and beyond. Two highlights of the last year will be described: 1. The QR instrument was revised to create a metric version. This instrument was piloted with about 30 Japanese Honors students enrolled at Soka University in Tokyo. The computer-based test was administered in English through contract with Madison Assessment, LLC. The students performed beautifully with high comparative scores when compared to JMU first-year students. Soka U plans to continue using the instrument and has a pre-post testing design in place. We will consider a full Japanese translation of the instrument for the future. Item and score-based analyses continue for this project. 2. The QR instrument will also play a major role in a new 3-year *Quality Collaboratives* AAC&U grant through which JMU is partnering with Blue Ridge Community College (BRCC). This project will explore the success of transfer students from BRCC to JMU; the institutions elected to focus the project on four majors. Interdisciplinary Liberal Studies (IDLS), the liberal arts major for all teacher education students, is the largest transfer major. The three other majors are all STEM related and represent study areas the BRCC feels have not achieved their potential and for which employers have expressed readiness to hire: Engineering, Computer Science, and Integrated Science and Technology. Scientific Reasoning (SR) will also be studied. Faculty on both campuses indicate that both QR and SR are important predictors of success for all four majors. Quantitative courses, in particular, have historically presented major difficulties for IDLS majors. We are currently preparing a large database comprised of student-level data from both institutions. The State Council for Higher Education of Virginia (SCHEV) is also playing a major role in this study with the explicit goal of impacting transfer policy. Of course, JMU and many other institutions across the country continue to use the QR as an integral part of their assessment of student learning outcomes. These efforts will also be discussed, and participants will be asked to describe their parallel efforts and any barriers they have experienced and hopefully overcome. Donna L. Sundre Professor of Graduate Psychology, Executive Director Center for Assessment & Research Studies (CARS) James Madison University: Harrisonburg, VA Masahiko Hirano School for Excellence in Educational Development, SOKA University: Tokyo, Japan Satoshi Sasaki School for Excellence in Educational Development SOKA University: Tokyo, Japan
1:30	*Financial Internships @ Hollins University* **Caren Diefenderfer,** Hollins University **Judy Morrill**, Highmount Capital **Nandini Roy,** Ernst & Young **Raisha Kasaju,** Citigroup **Pauline Khoo,** JP Morgan A majority of Hollins students complete at least one internship during their four undergraduate years and many complete two or more. Internships take our students all over the country, from hospitals to newsrooms, from museums to government agencies, and from movie studios to law firms. Hollins students have interned with *The London* Times and Miramax Films; with ABC News; with the U.S. Senate, and the Smithsonian Institution. Hollins places such importance on internships because they help our students test out careers in the workplace. They also help students in finding a job after graduation. Interns tend to receive more job offers and higher salaries than graduates who have not had work experience. On average within one year of graduation, 70% of Hollins graduates are employed and 27% attend graduate or professional school. Hollins University's January Short Term has been an ideal time to offer internships for students in business and education. In the last five years, Judy Morrill (managing director of Highmount Capital) is one of the Hollins alumnae in New York City who has sponsored Hollins student interns and Hollins is currently using our New York intern program as a model to create additional student internship clusters across the country with alumnae in targeted cities. Highmount Capital is an independent wealth management firm that is also committed to financial education for the next generation and women.

	This panel will include Ms. Morrill, a three recent Hollins alumnae who participated in internships (with the World Bank, the New York Stock Exchange, and UBS) during their undergraduate years. The panel discussion will address: • The benefits of sponsoring undergraduate internships from businesses' viewpoint • Keys of a successful internship program • Reflections on the internship experience from recent graduates • The significance of completing internships from the point of view of the recent graduates
	How Journalists and Educators Can Help Preserve Earth's Biosphere by Improving Numeracy and Scientific Informativeness **Michael Andrew Ranney** **Dav Clark** **Daniel Reinholz** **Myles Crain** **Denny Gillingham,** University of California, Berkeley Superior numeracy has helped people (as individuals, societies, and a species) gain competitive advantages. But now we face a tougher "foe"--global climate change--one that is intertwined with both resource limits (e.g., on inexpensive, clean energy) and extant business/finance interests. Humanity seems to need both an immediate enhancement in its ecological numeracy and a concomitant boost in apt scientific information, lest we face mass extinctions and a huge drop in our collective quality of life. In prior work, our Numerically Driven Inferencing paradigm has sought to enhance the numeracy of journalists and teachers as well as those they hope to inform. We now present new surveys and experiments that highlight climate change ignorance and innumeracy (especially in the U.S.), along with ways to help ameliorate the situation. We found that a numerically-infused explanation of the physical/chemical mechanism of global warming dramatically enhances such mechanistic understanding, and--in as little time as two minutes--it can both (a) more than double (and sometimes quintuple) knowledge of the mechanism and (b) yield appropriate attitude changes. Several of our studies show that virtually no Americans know even a basic (e.g., 35-word-level) mechanism of climate change (i.e., to explain "how energy can get to the Earth easily, yet has difficulty getting away from it"). Therefore, it would seem incumbent upon journalists and educators to disseminate this quickly-imparted information to citizens, students, and business/finance leaders as soon as possible.
	Mid Program General Education Assessment on Quantitative and Scientific Literacy **Sue Mente,** Alverno College Alverno College has an ability based curriculum with eight core abilities. Quantitative Literacy is a component of the communication ability. Although students usually demonstrate ability criteria within their courses, the Mid Program General Education Assessment is an opportunity for them to demonstrate abilities in an external setting. During this required assessment, students are assessed on their ability to transfer beginning quantitative and scientific literacy skills to a make decisions about a contemporary topic. Students make a hypothesis based on a description of data that will be provided to them. They then explore the data, make some representations, and discuss their findings at a basic level. Students' work is assessed by faculty and staff from across all disciplines in the College, as well as members of the Milwaukee community. After their work is assessed, students meet individually with their assessors to discuss strengths and areas to develop in their quantitative and scientific literacy. During this session, I would like to discuss the students' experience with the assessment, the joys and challenges of working with the diverse group of assessors, and what we have learned from student results. Sue Mente Assistant Director/Quantitative Literacy Coordinator Instructional Services Alverno College 414-382-6025 Sue.mente@alverno.edu
2:00	*Quantitative Reasoning Course for Journalism Students* **Barbara Selvin,** Stony Brook University Journalism students often lack confidence in their quantitative reasoning skills, yet journalism requires practitioners who readily grasp the quantitative aspects of the news and can communicate those ideas clearly, accurately and succinctly. Similarly, many journalism students shy away from studying business and financial reporting, perhaps because of doubts about their QR skills. Yet an understanding of the business world is key to full coverage of every newsroom "beat," from City Hall to concert halls. One way to address these related weaknesses is by teaching journalism students about the business of journalism itself. At Stony Brook University, journalism majors and minors

	must take JRN 301: Journalism 24/7, a course on the changing news industry. By focusing on the financial underpinnings of the news industry, Journalism 24/7 enables students to grapple with the very real impact of shifting levels of profitability and how those changes may affect their own futures. The lessons learned in this course show students how quantitative reasoning adds impact to a narrative and teaches fundamentals that they can apply in many other settings. Barbara Selvin Stony Brook University Barbara.Selvin@stonybrook.edu
	Blogging for Quantitative Literacy **Kira Hamman,** Pennsylvania State University The many definitions of numeracy have certain commonalities, including the ability to understand reasoning with quantitative data and to effectively communicate that understanding. Our task in quantitative literacy classes, then, is to teach students not only to *understand* but also to *communicate*. To that end, my QL classes each produce a class blog composed of student-written entries linking topics discussed in class to current events that are selected by the writers. Students then comment on one another's posts, and both in- and out-of-class discussion ensues. This not only improves the quality of both student writing and class discussion, but also empowers students to think critically about the quantitative aspects of issues in the world right now. In this talk I will give examples of this and provide some nuts-and-bolts information about creating, maintaining, and using a class blog. Kira Hamman khh11@psu.edu
2:30	*Evidence and Inference: Statistical Literacy for Midcareer Journalists* **Jessica S Ancker**, Cornell University **Nicholas Lemann**, Columbia University Journalism involves the constant collection and weighing of evidence. "Evidence and Inference," the core course in Columbia's master of arts in journalism, is intended to help journalists learn how scientists collect and weigh evidence with the goal of improving critical thinking and analysis. Statistical reasoning is the first segment of the course, with each statistical concept linked to a series of journalistic take-home points. Students practice calculating descriptive statistics on simple data sets (such as heart rates within the class and national census data on incomes) in part to overcome the math anxiety that is prevalent among journalists, but also to introduce journalistic take-home points: different data distributions must be described differently to the reader and may have different policy implications. Examples from political polling and weather forecasting are used to illustrate confidence intervals and margins of error, emphasizing basic take-home points about transparency and uncertainty inherent in extrapolating from any sample to the larger population. Concepts from multiple regression introduce the important lesson that social and scientific phenomena are typically multifactorial, even though researchers, policymakers, and best-selling authors often want to blame a single cause. In this talk, we will introduce case examples and educational activities developed by a former wire service journalist who is now a health researcher (Ancker) in collaboration with a journalist and educator (Lemann). Jessica S Ancker, MPH, PhD, Assistant Professor, Center for Healthcare Informatics and Policy, Weill Cornell Medical College, New York, NY Nicholas Lemann, Dean, Graduate School of Journalism, Columbia University, New York, NY

	Research methods for public policy and management:
	In-class exercises and other forms of active learning
	Dahlia Remler, Baruch College/CUNY
	
	Calls for data and evidence surround public policy and public management practitioners today. Yet many masters' students in these fields find their research and analysis courses irrelevant. Students also find the analytical thinking necessary for critical interpretation of research to be difficult. Over twelve years of teaching research methods, I have several core practices that have made the subject compelling, useful and accessible to students. These are the main principles:
	• Students should write and speak about research
	  ○ Interpreting results
	  ○ Designing studies

	• Always use specific applications—and make them rich ones
	  ○ Provide many different applications
	• Use active learning
	• Whenever possible, let students pick the application of their assignment
	  ○ Particularly valuable for students who are currently working
	
	Course content: My research methods course is designed to follow and build upon a prior statistics course, although a good share of the content is not quantitative. The basic structure of the course emphasizes the distinction between descriptive and causal research. However, I believe that the principles demonstrated in the materials could be used for a wide variety of research and analysis courses, not just ones structures as my own is.

3:00	*To Write Well, Reason Quantitatively; To Reason Quantitatively, Write Well: Teaching the Two in Concert to College Students* **Bernard Madison,** University of Arkansas **Neil Lutsky,** Carleton College This discussion will give two models of teaching writing and quantitative reasoning (QR) together, one at Carleton College and one at the University of Arkansas. Neil Lutsky will review specific assignments, grading rubrics, and teaching practices associated with a first year seminar designed to address both students' writing and their facility with quantitative reasoning and to use each to enhance the other. Bernie Madison will review how writing has become more prominent in the QR course at Arkansas, give some plans for further integration, and cite some student voices arguing for (and a few against) the format. Opportunities for noting others' experience with integrating writing and QR will be provided. Neil Lutsky, William R. Kenan, Jr. Professor of Psychology, Carleton College **nlutsky@carleton.edu** Bernard Madison, Professor of Mathematics, University of Arkansas bmadison@uark.edu.
	Promoting Quantitative Literacy Through Business Applications **Jean Richard,** Borough of Manhattan Community College/CUNY **Annie Han,** Borough of Manhattan Community College/CUNY The concept of quantitative literacy has been around for about half-century. Several educators in the United States have emphasized the central role of quantitative literacy in society, personal and business world (Steen, 2001, Madison & Steen, 2003). Using real business data through class projects and group work, stressing conceptual understanding students become active learners. This presentation will share our experience in integrating business data to promote quantitative literacy in a traditional statistics class.
4:00	*Journalism Panel* **Michael Ranney,** University of California, Berkeley **Barbara Selvin,** Stony Brook University **Jessica S Ancker**, Cornell University **Mark Hansen**, Columbia University **Corrine Taylor**, Wellesley (Moderator) This panel will feature our journalism experts who will briefly speak about their experiences with journalism and numeracy; and then open up the floor to questions.
	Social Explorer **Andy Beveridge,** Social Explorer Inc./Queens College/CUNY *Social Explorer* is an award-winning web application that changes the way we interact with data using maps and reports. From research libraries to the front page of The *New York Times, Social Explorer* helps people engage with society and social science. It allows users to explore local and national census data from 1790 to the present, as well as other data sources. Social Explorer enables users to conduct research related to the social sciences, history, business, current events and more with ease. Last year over 540,000 *Social Explorer* users created more than 8 million maps and 200,000 reports. Over 200 libraries and more than 40,000 students across the US use *Social*

	Explorer. It has been a go-to resource for the *New York Times*. *Social Explorer* was named an "Outstanding Reference Source" by the Reference and User Services Association (RUSA), a division of the American Library Association and recently received an "Excellence in Publishing Award" from the WEB Marketing Association. A Professional Edition is distributed by Oxford University Press Online, and a Student Edition is licensed to Pearson Higher Ed along with quantitative exercises for Sociology, History and Political Science. Working with learning science researchers from the University of Illinois Chicago and funded by NSF, Social Explorer is investigating issues surrounding using complex visual materials for understanding social change and social relationships. President, Social Explorer, Inc Phone 1-914-337-6237 Mobile 914-522-4487 andy@socialexplorer.com www.socialexplorer.com Prof of Sociology Queens College and Grad Ctr CUNY Chair Queens College Sociology Dept Office: 718-997-2852 Email: andrew.beveridge@qc.cuny.edu
	Common Sense Mathematics **Ethan Bolker**, UMASS Boston Several years ago Maura Mast and I began our collaboration on an approach to the quantitative literacy curriculum that addressed the question "what do we want our students to remember ten years from now?" rather than "what should the syllabus cover?" Starting with that question dramatically changed both what and how we teach. The course and the text we have developed incorporates what we learned about helping students bring common sense and common knowledge and appropriate useful memorable mathematics (less than you might imagine) to bear when facing genuine daily questions that require them to make sense of numbers. In this talk I'll recreate some of their experience. Ethan Bolker Professor of Mathematics UMass Boston eb@cs.umb.edu www.cs.umb.edu/~eb
4:30	*Count Me In: Exploring the Relationship between Quantitative Reasoning and Civic Engagement* **Louis M. Rocconi,** **Amber D. Lambert,** **Alex C. McCormick,** **Shimon A. Sarraf,** National Survey of Student Engagement/ Indiana University The modern world is awash in numbers. Thus, people must be able to use and understand quantitative information in order to be productive citizens. This study uses data from the National Survey of Student Engagement to explore how college students' quantitative reasoning (QR) activities relate to three aspects of civic engagement: civic leadership, civic awareness, and civic activism. Results show that more frequent use of QR activity is associated with higher levels of civic engagement, indicating the important role QR may play in college students' civic involvement. Results also demonstrate differences in civic engagement by major, gender, race/ethnicity, and prior academic ability. Louis M. Rocconi, Assistant Research Scientist, National Survey of Student Engagement (lrocconi@indiana.edu) Amber D. Lambert, Assistant Research Scientist, National Survey of Student Engagement (adlamber@indiana.edu) Alex C. McCormick, Director, National Survey of Student Engagement and Associate Professor (amcc@indiana.edu) Shimon A. Sarraf, Assistant Director for Survey Operations, National Survey of Student Engagement (ssarraf@indiana.edu) All presenters are affiliated with Indiana University – Bloomington and the Center for Postsecondary Research.
	QR Courses at The New School: Practical Applications for Design, Business, Journalism, and Citizenship **Carol Overby**, Parsons the New School for Design **Laurie Tvedt**, Parsons the New School for Design **Aaron Fry,** Parsons the New School for Design **Caren Diefenderfer,** Hollins University The New School has recently developed QR courses in two different divisions: the evening school (CE and degree completion) of The New School for Public Engagement, and the BBA program in Design + Management at Parsons the New School for Design. This presentation will describe the courses' incorporation of - the university's mission of civic engagement

	- non-traditional student populations - specific professional skills and needs - visually-based pedagogies and graphic skills
5:00	*Collaborative team projects to enhance the Quantitative Literacy of Community College students majoring in Business* **Edward Volchok,** Queensborough Community College/CUNY This presentation will report on a study of community college students that examined the impact of two teaching techniques on students' QL: A collaborative approach using team projects and a traditional approach whereby students completed homework assignments by themselves. The data suggest that cognitive QL scores improved significantly in the class assigned team projects (p-Value of 0.003), whereas the homework-intensive class and two control classes exhibited no improvement. Students' affective or self-efficacy scores, however, show no significant improvement in any of the four cells. In addition, the data suggest that is no significant correlation between cognitive and affective scores. Edward Volchok Associate Professor Queensborough Community College/CUNY 718-281-5532
	The Language of Comparisons **Jessica Polito,** Wellesley College Drawing accurate and clear comparisons between rates is a key skill for any form of quantitative writing, yet many people -- from students to journalists -- cannot reliably describe the relationship between two percentages. A limited understanding of percentages also makes it easy to be misled by statistics which have been carefully selected to imply an invalid conclusions. I lay out a framework for analyzing and describing comparisons of percents and rates, with many examples of errors and intentional distortions from news and advertising.