

*ASPPH Presents Webinar Series*

***Strategies for Effective Teaching of a  
Target Skill to Undergraduate Public  
Health Students***

Thursday, June 15, 2017  
1- 2:00 p.m. Eastern

ASPPH.ORG

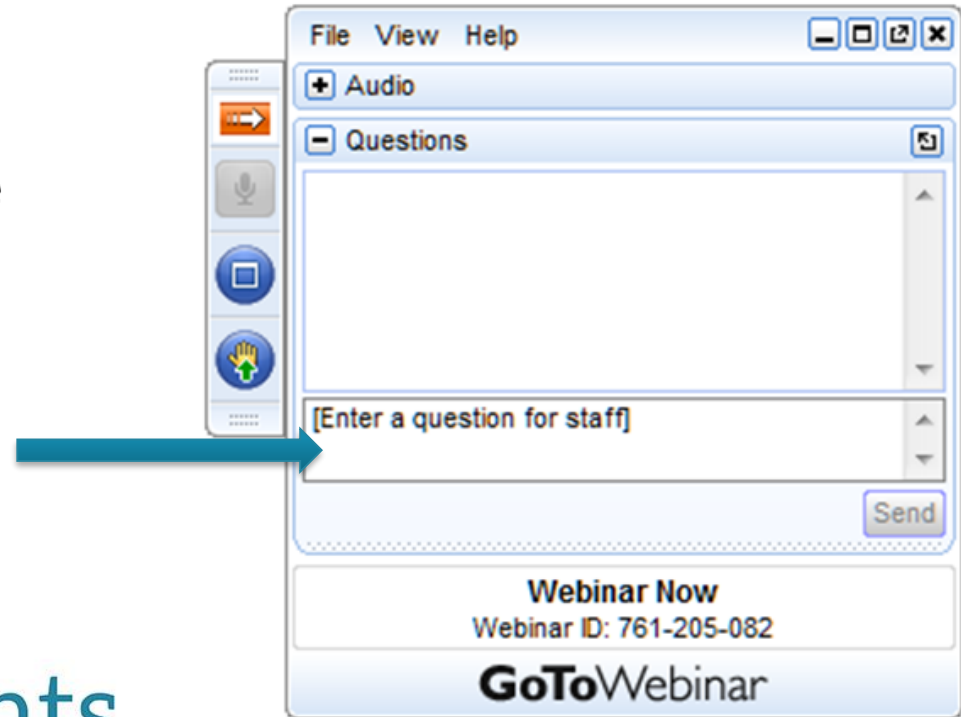
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**ASPPH Presents**  
 **WEBINAR**

# Method for Submitting Questions

## Join the Conversation...

- You can ask questions in writing anytime during the webinar.
- Simply type them in the “Questions” field on the right side of your screen.



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# Today's Presenters

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**Laura Wheeler Poms,  
PhD, MPH, MA**  
George Mason University



**Corrie Paeglow, DrPH, MPH**  
George Mason University



**Tracy Ruscetti, PhD**  
Santa Clara University



# DEVELOPING UNDERGRADUATE RESEARCH SKILLS THROUGH A SCAFFOLDED LEARNING PROCESS

Laura Wheeler Poms, Corrie Paeglow,  
Julianna Miner, Ali Weinstein, & Robert Weiler  
Global and Community Health



STUDENTS AS SCHOLARS  
[oscat.gmu.edu](https://oscat.gmu.edu)



# UNDERGRADUATE RESEARCH AT MASON



STUDENTS AS SCHOLARS  
» [oscar.gmu.edu](http://oscar.gmu.edu) «

## Creation of Scholarship

### Research & Scholarship intensive

Students will create an original scholarly project and communicate knowledge from their scholarly or creative project.

### Scholarly Inquiry

Students will engage in elements of scholarly inquiry.

Students will discover how they can engage in the practice of scholarship.

## Discovery of Scholarship

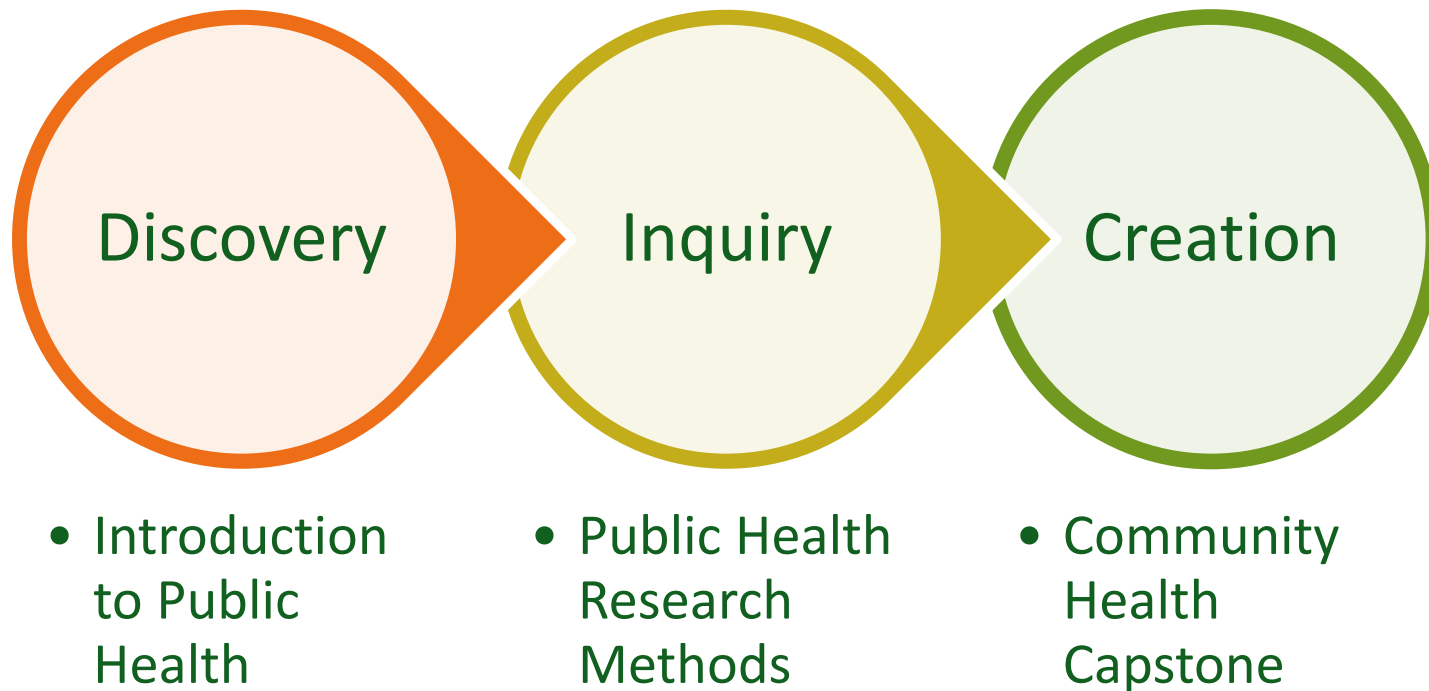
Understand the value of knowledge and how it is generated and communicated.

# GLOBAL AND COMMUNITY HEALTH

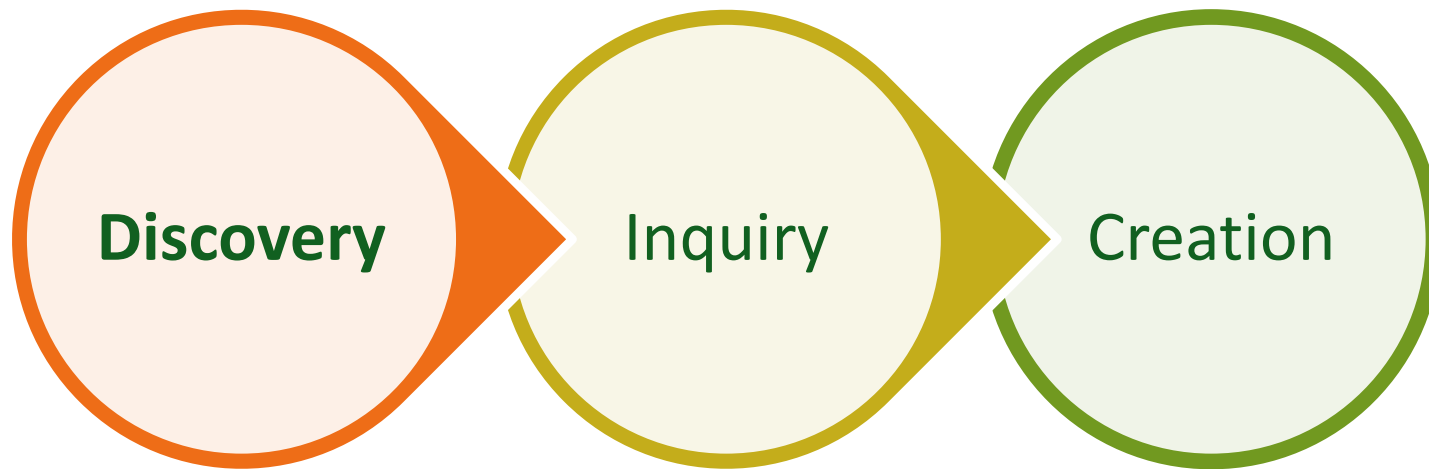
≈ 550 students

- Complete curriculum revision
- At least one signature assignment in each class
- Challenges
  - No clear intro class
  - No existing research methods class
  - New capstone course
  - Accreditation
  - Staffing

# SCAFFOLDING WITHIN CURRICULUM



# SCAFFOLDING WITHIN CURRICULUM



- Introduction to Public Health

- Public Health Research Methods

- Community Health Capstone



# DISCOVERY

## INTRODUCTION TO PUBLIC HEALTH

### CHALLENGES

Multiple sections with multiple instructors

- Respect different approaches to the same assignment while meeting objectives
- Need to team with adjuncts
- Common assignments

# DISCOVERY

## INTRODUCTION TO PUBLIC HEALTH

### STUDENT LEARNING OUTCOMES

- Distinguish between personal beliefs and evidence
- Understand how knowledge is transmitted within a disciplines, across disciplines and to the public
- Evaluate credibility of source information

# DISCOVERY

## INTRODUCTION TO PUBLIC HEALTH

### ASSIGNMENT

Literature search and annotated bibliography

- Objective is to demonstrate the ability to conduct a systematic literature search using credible sources
- Worksheet provided to walk them through the process in addition to a targeted library orientation
- Required to find 5 research articles from different journals, including 2 systematic review articles and 3 research articles
- Create annotated bibliography in APA style including a critical analysis of the text

# DISCOVERY

## INTRODUCTION TO PUBLIC HEALTH

### ASSESSMENT

- Anecdotal evidence
  - Reinforced methods and process
  - Practice increased value



# DISCOVERY

## INTRODUCTION TO PUBLIC HEALTH

### LESSONS LEARNED

- Use care deciding how and when you pilot an assignment
- Keep in mind your own time constraints
- Partnering with adjunct faculty critical

# SCAFFOLDING WITHIN CURRICULUM



- Introduction to Public Health

- Public Health Research Methods

- Community Health Capstone

# INQUIRY

## PUBLIC HEALTH RESEARCH METHODS

### CHALLENGES

- New course creation
- Build on Discovery course
- Multiple full-time faculty members
- Part of University level assessment

# INQUIRY

## PUBLIC HEALTH RESEARCH METHODS

### STUDENT LEARNING OUTCOMES

- Articulate and refine a scholarly question
- Follow ethical principles
- Gather evidence appropriate to the question
- Apply the basic concepts and methods of public health data collection and analysis



# INQUIRY

## PUBLIC HEALTH RESEARCH METHODS

### ASSIGNMENTS

- Design a study
  - Students practice designing one of each type of study we discuss in class
- Design two ways
  - Take one research question and design two different studies that answer it
- Analyze data collection tools
- Understand and critique a specific section of a paper

# INQUIRY

## PUBLIC HEALTH RESEARCH METHODS

### ASSESSMENT

- Apply the basic concepts and methods of public health data collection and analysis
- Students asked to design a study and answer questions about data collection and analysis
- Target proficiency was that 75% of student would score 80% or better
- Proficiency averaged about 69% but great variability across sections
  - Inter-rater reliability issues?
  - Issues with question ambiguity?

# INQUIRY

## PUBLIC HEALTH RESEARCH METHODS

### LESSONS LEARNED

- Get students into the literature early
  - Start very simply
  - Teach them to read each of the sections of a paper
- Practice, practice, practice
  - Some skills (e.g. reading and interpreting tables) take all semester to master
- Reduce subjectivity in assessment
  - Moved to multiple choice questions for assessment

# SCAFFOLDING WITHIN CURRICULUM



- Introduction to Public Health

- Public Health Research Methods

- Community Health Capstone

# CREATION

## COMMUNITY HEALTH CAPSTONE

### CHALLENGES

- Senior-level synthesis, capstone, career-development, writing intensive class
- Includes all 550+ majors (not an honors course)
- Curriculum changes = sequencing challenges
- Multiple sections with multiple instructors (a theme!)

# CREATION

## COMMUNITY HEALTH CAPSTONE

### STUDENT LEARNING OUTCOMES

- Articulate and refine a focused and manageable challenge that may contribute to the field
- Acquire information or data using effective, well-designed strategies to provide a solution to the challenge
- Consistently use appropriate criteria to judge the credibility of evidence.
- Consistently identify relevant ethical issues

# CREATION

## COMMUNITY HEALTH CAPSTONE

### FUTURE PLANS

- Providing a well-researched, reasonable solution to a public health problem is a relevant skill for students
- Case competition solving a contemporary or emerging public health issue
- Teams will present case solutions to a group of expert judges
- Piloting in Summer 2017
- Stay tuned

# CURRICULUM SCAFFOLDING TAKEAWAYS

- Scaffolding works!
  - Sequencing matters
  - Observed effects in classes not in the sequence
  - Hard code into registration system
- Begin with end in mind
  - Decide on measures early in process
- Pilot one section if possible
- Don't be afraid to change in mid-process
- Don't put too much into one class



# CURRICULUM SCAFFOLDING TAKEAWAYS

- Collaboration is key!
  - Within courses
  - Across courses
  - With other departments



## CONTACT INFORMATION



**Laura Poms**  
**Undergraduate Coordinator**  
**Global and Community**  
**Health**  
[lpoms@gmu.edu](mailto:lpoms@gmu.edu)



STUDENTS AS SCHOLARS  
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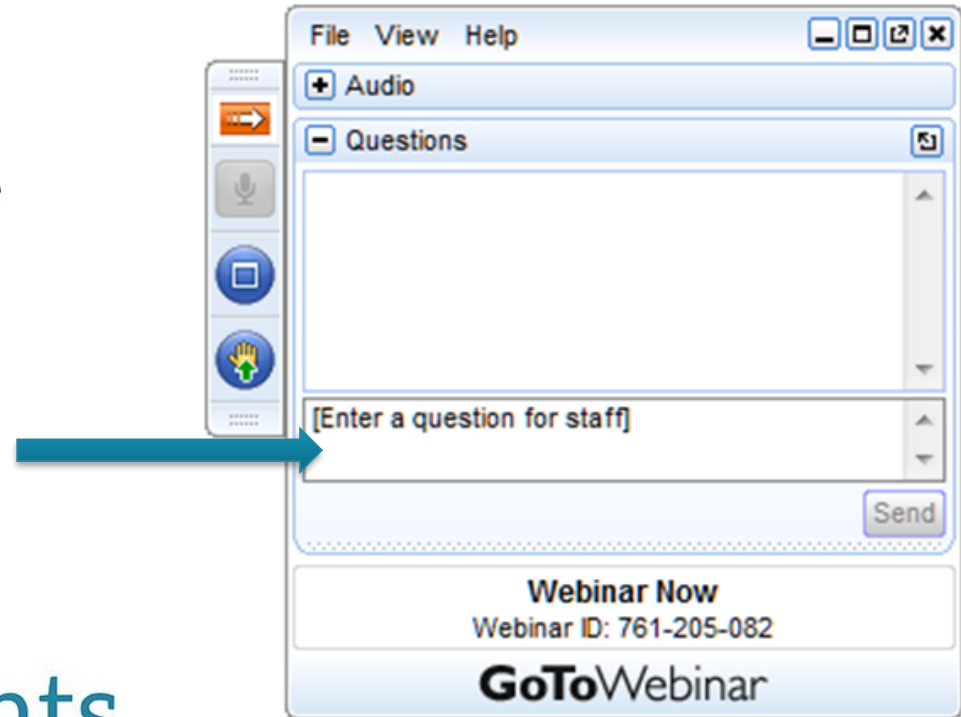
This work was funded by a GMU *Students as Scholars* Scholarship Development Grant

GEORGE MASON UNIVERSITY

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# BUILDING UNDERGRADUATES' SKILLS IN READING AND EVALUATING RESEARCH

Corrie Paeglow  
Global and Community Health



# OBJECTIVES

- Plan a series of assigned readings appropriate for building students' skills in reading and evaluating public health research
- Develop a strategy to teach students to read and evaluate public health research
- Apply strategies to ensure students complete their assigned reading
- Assessment students' ability to read and evaluate research articles

# WHY DO STUDENTS NEED THESE SKILLS?

- Some students will pursue advanced degrees or become researchers
- Every professional discipline uses research to inform practice
- People use research to inform their life decisions

# CREATING THE READING LIST

- Start simple, work to greater complexity
- Use papers from a variety of sub-disciplines
- Choose papers that are relevant to students
- Any suggestions for a good case control study?

# LEARNING TO READ THE RESEARCH

- Task analysis: Breaking a skill down into smaller, more manageable components
- Breakdown of the sections of the paper
  - Background
  - Methods (4 S's)
    - Study design
    - Sample
    - Survey (measurement)
    - Statistical analysis
  - Results
  - Discussion/conclusion



# TEACHING STUDENTS TO READ

- Students are given questions for each section
  - If they can answer, they should understand the article
- The results section has to be read differently
  - Tables first, then text
  - Understand the format before looking at data

# QUESTIONS FOR UNDERSTANDING THE SAMPLE

- What population was studied? How were the participants recruited?
- How many participants were there?
- Is this is a descriptive study? Was the sample representative of the target population?
- Is this is an analytic study? Were the groups being compared as similar as possible?
- Were there losses to follow-up? If so, how many people and what percent were lost to follow-up?

# HELPING THEM PRACTICE THEIR SKILLS

- Emphasize the importance of practice
- Provide ample opportunities for practice
- Ensure they're doing the practice
  - Reading response assignment

# EVALUATING INTERNAL VALIDITY

|  | Strengths | Weaknesses |
|--|-----------|------------|
| Study design                               |           |            |
| Sample                                     |           |            |
| Data collection tools                      |           |            |
| Data collection process                    |           |            |
| Statistical analysis                       |           |            |
| Anything that doesn't fit into another box |           |            |

- Students rate the paper from 0 (no internal validity) to 10 (perfect internal validity)
- No right rating, but must be able to justify the rating
- Common pitfall: Conflating internal & external validity

# EVALUATING EXTERNAL VALIDITY

- After learning to assess internal validity, switch to external validity
- Students often find this easier
  - Important to note that internal validity should be assessed first

# CULMINATING ASSIGNMENT

- Two part assignment, about 6 pages long
  - Part 1: Focus on understanding the article
  - Part 2: Assess the internal validity of the article
- Students encouraged to show off everything they've learned during the semester

# STUDENT EXAMPLES

- “Another weakness would be the likelihood of residual confounders... although the cases and controls were chosen from the same place and were as similar as possible, there is still the possibility of other confounders.”
- “There were a few limitations that weakened the internal validity. The study design, case-control, isn’t a strong design to provide evidence for a causal relationship between the exposure and outcome.”
- “Another strength would also be having a pool of data that is accurately collected and updated like the Nationwide Danish registries that provide you with reliable data on possible patients and control group participants. Some weaknesses of the study can be residual confounding because you can never really accurately list all the potential confounders so there will be some doubt left behind.”

I'm always happy to share materials and ideas and take suggestions. Please feel free to contact me:

[cpaeglow@gmu.edu](mailto:cpaeglow@gmu.edu)

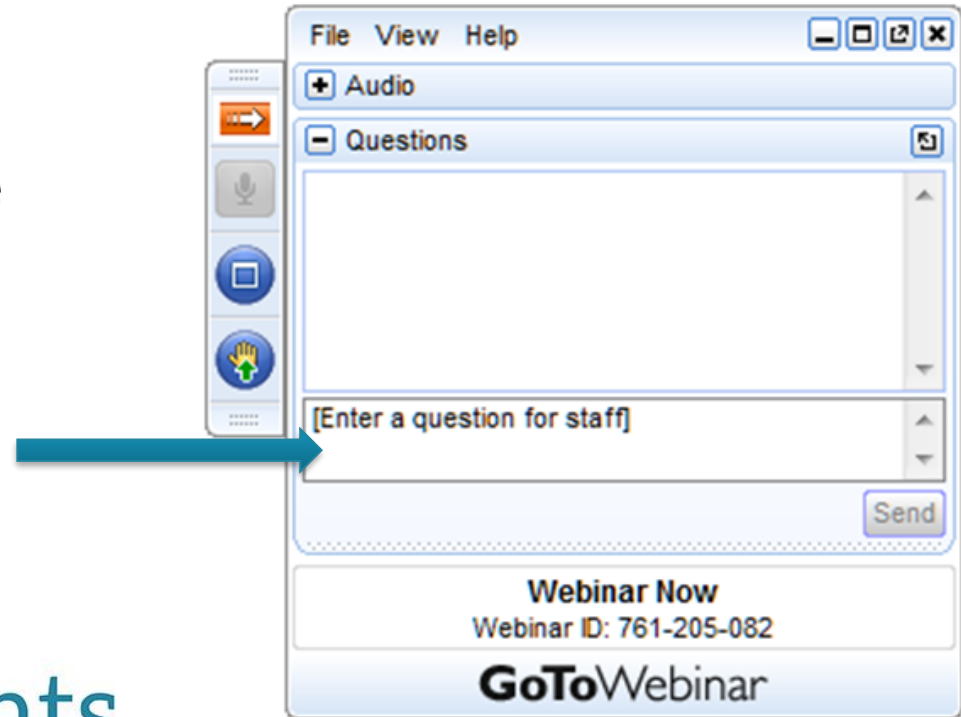
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# Method for Submitting Questions

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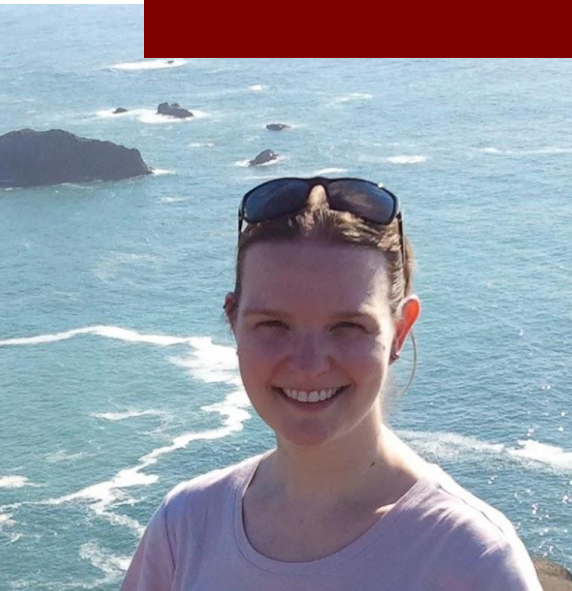
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# Improving Written Communication of Quantitative Information



Tracy Ruscetti  
Christelle Sabatier  
Katie Krueger  
Kat Saxton  
Santa Clara University





# Why Quantitative Writing

- Writing is a primary mode of communication
- Instructors find it difficult to parse poor writing from poor reasoning
- Instructors make assumptions (good and bad) about knowledge, understanding, and critical thinking
- It's painful to read poor writing



# Writing in Public Health

| Type of Writing   | Quantitative |
|-------------------|--------------|
| Reports           | Often        |
| Funding Proposals | Often        |
| Research Papers   | Often        |
| Lit Reviews       | Often        |
| Case Studies      | Often        |
| Risk Assessment   | Always       |



# Writing in Public Health

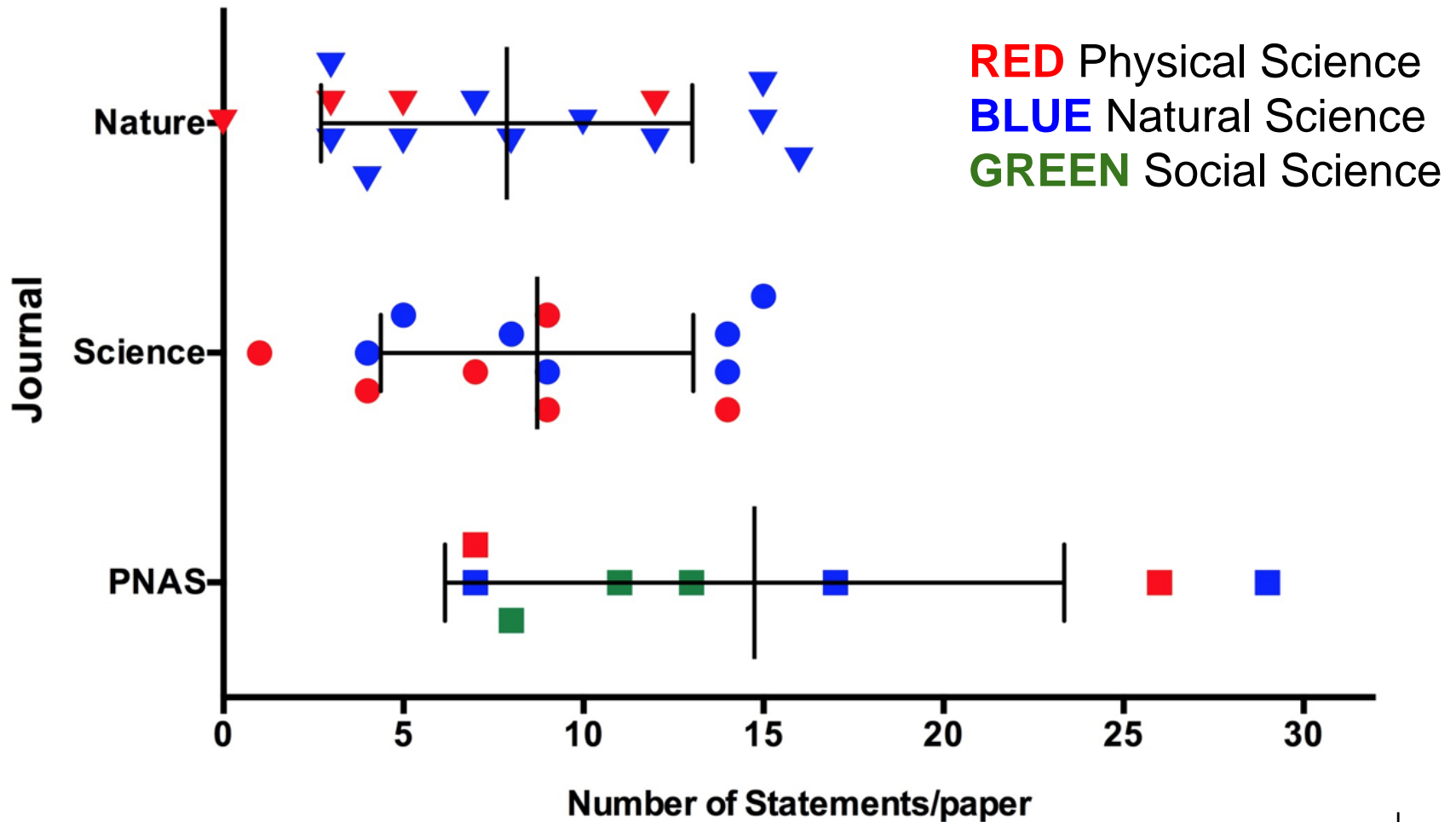
**Quantitative writing is almost ALWAYS a comparison between two conditions.**

- There are 10% more first generation students at X school compared to Y school.
- X behavior increases lung cancer risk 3 fold compared to Y behavior.

**Quantitative Comparative statement**



# Ubiquity of Quantitative Comparative Statements





# Typical writing about quantitative information

## Comparing effect of two math programs on test scores

\* The math program also has a main effect on test scores b/c the new program shows test score averages that are higher than the old program → new = 63.5 pts & old = 63.5 pts

well. The main effect for math program is statistically significant, meaning that on average in the populations, people tend to score better with the new curriculum rather than the old one.



# Critical components of a quantitative comparative statement

- Calculation
- Context
- Comparison
- Clarity

**4C**



In Brazil, people living in low income neighborhoods are 5 times more likely to contract Zika Virus than people living in high income neighborhoods.

a. Find the relational phrase or **Calculation**

- i. Does it have magnitude and direction?
- ii. Box it

b. Find the **Context**

- i. What are we talking about? (Condition, outcome)
- ii. Circle it

c. Find the **Comparison**

- i. What two things/groups/times are being Compared?
- ii. Underline them

d. Check for **Clarity**

- i. All components present and proximate?
- ii. No redundancies or contradictions?



# Using 4C as feedback

Comparing effect of two math programs on test scores

The math program also has a main effect on test scores b/c the new program shows test score averages that are higher than the old program → new = 65.5 pts & old = 63.5 pts

Feedback:

Calculation needs magnitude

Asks reader to do the calculation



# Using 4C annotation as feedback tool

Comparing effect of two math programs on test scores

well. The main effect for math program is statistically significant, meaning that on average in the populations, people tend to score better with the new curriculum rather than the old one.

Feedback: Missing magnitude

Context is not specific



# Outcomes

After 4C annotation writing intervention

- Students automatically checked their writing
- Students translated this skill to oral communication
- Instructors can provide explicit and useful feedback to students
- Instructors can distinguish between writing and underlying reasoning.



# Activity-Scoring

People exposed to second-hand smoke are 2 times more likely to develop cardiovascular disease than people who were not exposed to second-hand smoke (Table 1).

+

+

+

+

4C



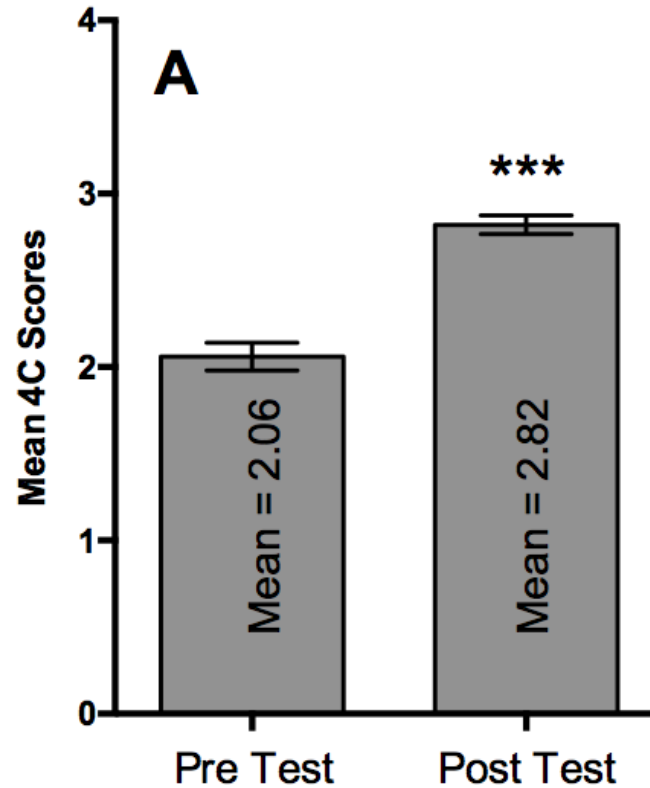
# Activity-Scoring (coding)

People exposed to secondhand smoke are more likely to develop cardiovascular disease

- + - - 1

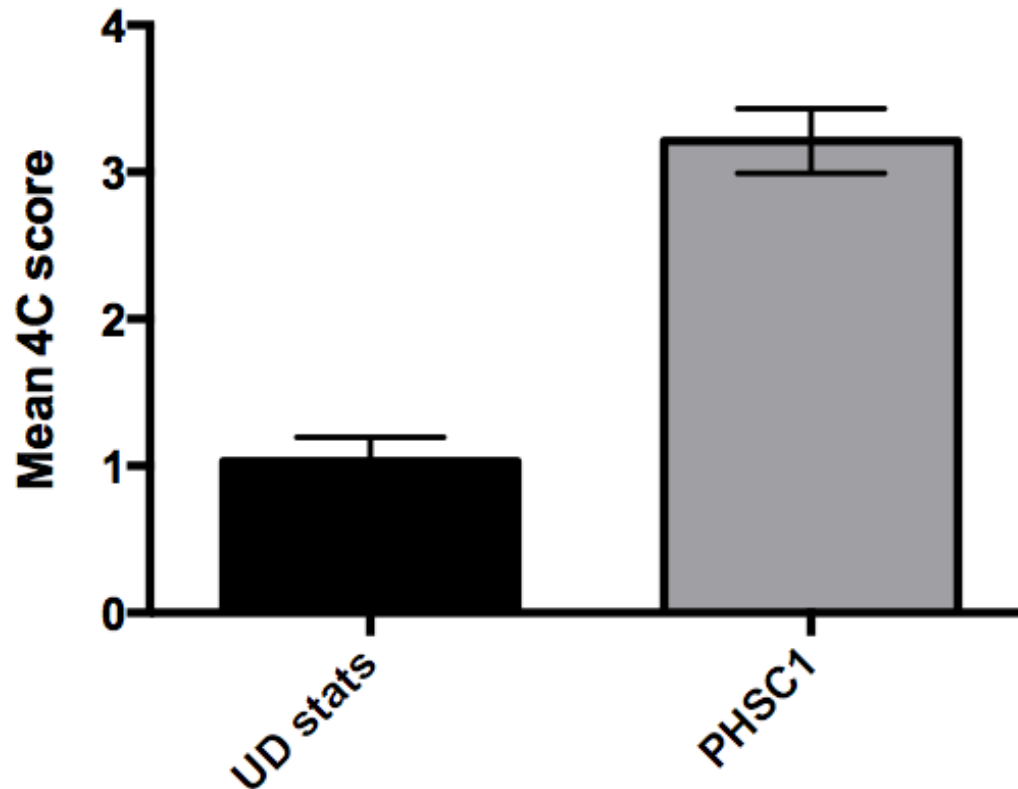


# Student writing improves following writing intervention





# 4C annotation intervention improves writing







# Acknowledgements

ASM Biology Research Scholar Program  
SCU Faculty Development Office  
SCU Biology Department  
SCU Public Health Department  
SCU Office of Assessment

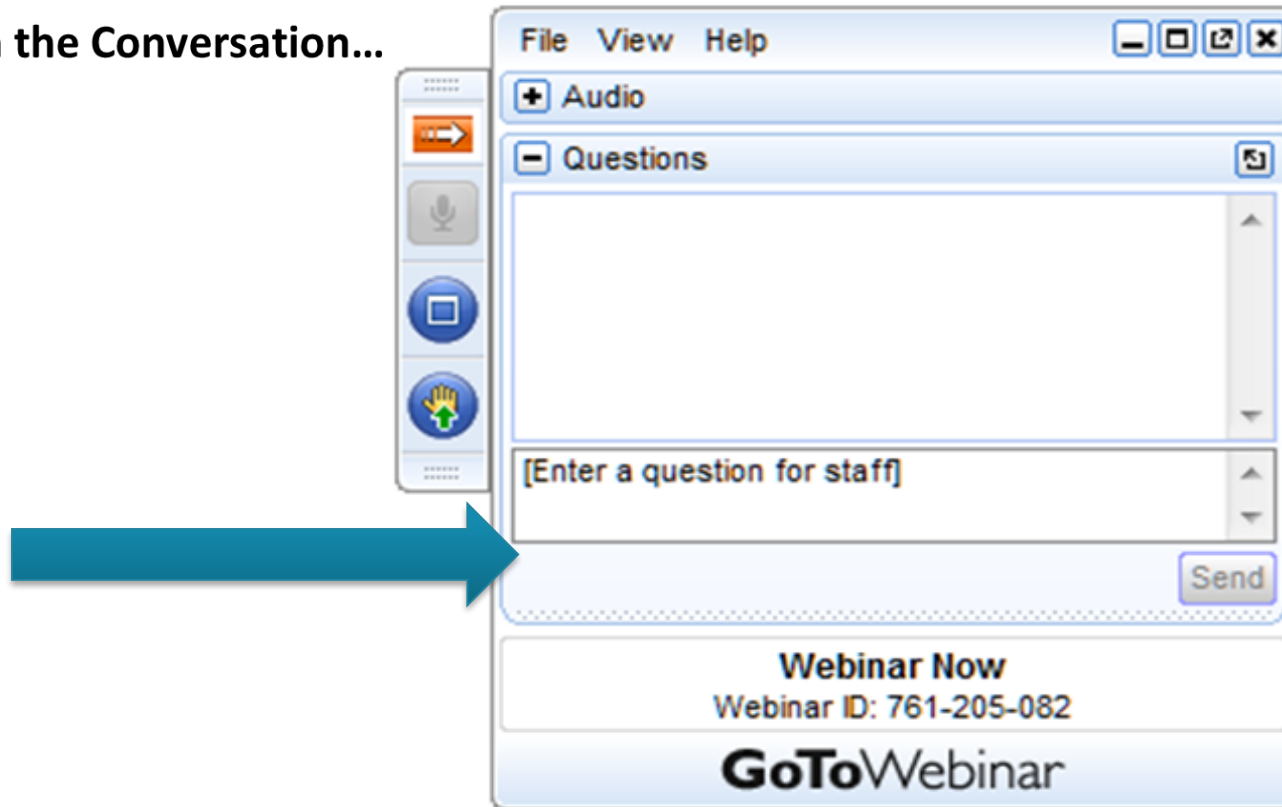
Polito, Jessica (2014) "The Language of Comparisons: Communicating about Percentages," *Numeracy*. Vol. 7 : Iss. 1 , Article 6.

DOI: <http://dx.doi.org/10.5038/1936-4660.7.1.6>

Available at: <http://scholarcommons.usf.edu/numeracy/vol7/iss1/art6>

# Questions or Comments?

Join the Conversation...



# Thank you to Today's Presenters

Now taking questions.

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**Corrie Paeglow, DrPH, MPH**  
George Mason University



**Tracy Ruscetti, PhD**  
Santa Clara University

# Thank You!

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See the webinar event page on the ASPPH website for a link to the **archived webinar**:

<http://www.aspph.org/event/aspph-presents-strategies-for-effective-teaching-of-a-target-skill-to-undergraduate-public-health-students/>

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**CPHCE**  
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Thursday, July 13, 1 – 2:00 p.m. Eastern

### **ASPPH Presents Using Competencies to Inform Undergraduate Program Design and Incorporation of Evaluation Activities**

Monday, July 31, 1 – 2:00 p.m. Eastern

### **ASPPH Presents Liberal Education - Professional Education: Is it Time for an Intentional, Integrative Approach?**

Tuesday, August 22, 1 – 2:00 p.m. Eastern

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Thank you!