# DIVERSITY OF METHODS: ASSESSMENT OF QUANTITATIVE AND QUALITATIVE RESEARCH MULTIPLIER EFFECT

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# Overview of Presentation

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# Research Objective

**In his 2003 AAPOR Presidential Address, Mark Schulman challenged survey researchers:**

**"…to move beyond our desks and our libraries and make contact with the real world," and summarized his message noting "neither qualitative nor survey research has a monopoly on uncovering the hidden truths. They often have a *multiplier effect* when they are together."**

# Research Objective (*continued*)

**In a 2009 email message Schulman further explained:**

**"By multiplier effect, I meant that the insights gained from combining qualitative and quantitative are more than just the independent sum of each. They often ***complement*** each other and produce far greater ***insights*** than either one independently."**

# Comparison: Quantitative and Qualitative Methods

| Quantitative | Qualitative |
|---|---|
| Deductive<br>▪ Verification and outcome oriented | Inductive<br>▪ Discovery and process |
| Measurement tends to be objective | Measurement tends to be subjective |
| Reliable<br>▪ Technology as instrument (the evaluator is removed from the data) | Valid<br>▪ Self as instrument (the evaluator is close to the data) |
| Generalizable<br>▪ The outsider's perspective<br>▪ Population oriented | Ungeneralizable<br>▪ The insider's perspective<br>▪ Case oriented |

Source: Steckler, Allan et al. "Toward Integrating Qualitative and Quantitative Methods: An Introduction."

# Models: Quantitative and Qualitative Methods

| Model | Description |
|---|---|
| A | Qualitative used initially to help develop quantitative measures |
| B | Qualitative used to help interpret and explain the quantitative findings |
| C | Quantitative used to help interpret qualitative findings |
| D | Qualitative and quantitative are used equally and parallel (often to cross-validate the findings) |

Source: Steckler, Allan et al. “Toward Integrating Qualitative and Quantitative Methods: An Introduction.”

# Methodology

1. Office of Research Integrity: ORI Faculty Survey and In-person Interviews

- **Quantitative Data**
  - Web survey of 3,534 recipients of 2005-2006 National Institutes of Health grants who had doctoral students (October 2008-March 2009)

- **Qualitative Data**
  - Pilot test of in-person interviews with nine faculty members who had also completed the web questionnaire (July-September 2009)

# Methodology (*continued*)

## 2. Multiplier Effect

- **Comparison of web survey responses with the in-person interviews to find out:**
  - **<u>Complement:</u> Are there response differences in (1) how faculty understand the questions and (2) form their answers in the quantitative and qualitative experience?**
  - **<u>Insights:</u> How, if at all, is the quality of information enhanced when both quantitative and qualitative methods are used to study a topic?**

**Limitations: Not a methods experiment. Faculty were not asked to explain the answers given on the questionnaire. The results that compare the two methods are based on our interpretation.**

# Themes and Research Questions Used for Multiplier Effect

| Faculty Role Description | Primary Responsibility for Doctoral Student Education | Faculty Activity with Doctoral Students |
|---|---|---|
| ▪ Preferred name for faculty role<br><br>[*Response choices: mentor, advisor, supervisor, other*]<br><br>▪ Describe role<br><br>[*Response choices: open-ended*] | ▪ RCR training<br>▪ Authorship policy<br>▪ Set data collection standards<br>▪ IRB/IACUC training<br>▪ Manage cases of misconduct<br>▪ Monitor Ph.D. progress<br><br>[*Response choices: institution, faculty, other*] | ▪ Discussed good research practices<br>▪ Reviewed rules of working in a lab<br>▪ Discussed data management<br>▪ Discussed research misconduct<br>▪ Interpreted student data<br>▪ Reviewed data with student for publication<br>▪ Assisted in preparing presentations<br><br>[*Response choices: did with all, some, none doctoral students*] |

# Multiplier Effect: Complement

- **Coding Process:**
  - **Compared quantitative and qualitative answer for each case**
  - **Judged if the responses matched**
  - **Reviewed non-matches**

| | Themes: Faculty Role Descriptions | Primary Responsibility for Doctoral Student Education | Faculty Activities with Doctoral Students | Total |
|---|---|---|---|---|
| Total Possible (cases x responses) | 18 (9x2) | 54 (9x6) | 63 (9x7) | 135 |
| Yes - Complemented Survey | 17 | 37 | 50 | 104 |
| No - Did Not Complement Survey | 1 | 9 | 10 | 20 |
| No - Data Not Covered in Interview | 0 | 8 | 3 | 11 |

# Complement: Non-Match Examples

- **Primary Responsibility for Doctoral Student Education**
  - **<u>Questionnaire</u>: Faculty responsible for Responsible Conduct of Research (RCR) training**
  - **<u>Interview</u>: Faculty does not directly train students in RCR. There is an annual institutional training students are required to attend**
    - Faculty comment: **"so it's sort of like that's taken out of our hands"**

# Complement: Non-Match Examples (*continued*)

- **Faculty Activities with Doctoral Students**
  - **Questionnaire :** Discussed research misconduct policy with some students
  - **Interview:** Faculty member reports all students are taking an ethics course
    - Faculty comment: **"pretty sure they can [recognize scientific misconduct] . . . because they're getting that training in the ethics course"**

# Multiplier Effect: Insights

- **Coding Process**
  - **Type 1**
    - Provided context for quantitative results
    - Expanded understanding of how faculty interpreted the relevant questionnaire items
  - **Type 2**
    - New information about the research questions that would not have been known without the interview
  - **Type 3**
    - Possible new topic area for ORI to consider—not on questionnaire or included in the interview protocol

# Multiplier Effect: Insights (*continued*)

| | Faculty Role Descriptions | Primary Responsibility for Doctoral Student Education | Faculty Activities with Doctoral Students | Total |
|---|---|---|---|---|
| Total Possible (cases x responses x type) | 54 (9x2x3) | 162 (9x6x3) | 189 (9x7x3) | 405 |
| Type 1:<br>▪ Gives context<br>▪ Expands understanding | 8 | 17 | 18 | 43 |
| Type 2:<br>▪ New relevant information | 2 | 8 | 5 | 15 |
| Type 3:<br>▪ Related, but new topic area | 1 | 0 | 4 | 5 |

# Insights: Faculty Role Descriptions

- **Complexity of faculty role**
- **Faculty/Student relationships**

# Insights: Primary Responsibilities for Doctoral Student Education

- Faculty view of institutional role
- Laboratory meetings

# Insights: Faculty Activities with Doctoral Students

- Faculty goals for doctoral student education
- Delegation of doctoral student education activities
- Challenges of identifying research misconduct

# Insights: Other

- **Non-USA faculty/students and ethical conduct of research**
- **Increased complexity of university organizations**
- **Role of academic/scientific culture**

# Summary

- **Was there a multiplier effect?**
  - **Complement: Qualitative information confirms quantitative data**
  - **Insights: Qualitative enhances quantitative information**
    - Provides a context
    - Contributes new information

# Summary (*continued*)

- **What is the multiplier effect value?**
  - **Client decision making**
    - Increased confidence in survey data
    - Provides descriptive information for examples
    - Identifies new information for future research
  - **Quality of research measurement**
    - Validation of questionnaire items

# Recommendations for Future Research

- **Establish a multiplier effect research agenda**
  - **Define dimension of multiplier effect**
  - **Conduct experiments**
  - **Include more qualitative cases**
- **Calculate the return on the investment**

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# INSIGHT EXAMPLES

# Non-USA faculty/students and ethical conduct of research

- She's on probation for her entire time here. I'm actually on her thesis committee. She's a very good student. She is from China. I think one of the things that we have to be really careful about is there are different standards of behavior, and I don't want to generalize about people, but what I've been told is that the Chinese, it's sort of a sign, a mark of reverence to plagiarize from somebody. You have to make sure your student; you know, it's not to say that Americans are more honest in any way than people from different, other cultures, but the norms can be different and there are certain things that you just take for granted. Case 1 p.58

# ACADEMIC/SCIENTIFIC CULTURE

- **Certainly, I came up through the system where there was very little discussion of what is responsible conduct in research. What is appropriate ethical behavior. And I suspect that a bunch of my colleagues who don't think about it. They sort of assume oh, I've got this inner compass. I know what's right. But I'm not sure they've ever had any formal training themselves, and that's probably something will, by itself, go away because now all of our students coming through are getting that training. But maybe it's something that the institution should be more careful about. Case 4 p.37**

# Increased Complexity of University

- **Then I'm a member of training programs in three different departments in the University. My primary appointment is here in the Department of Environmental Health Sciences in the School of Public Health, where in the past I've served as Director of the Division of Toxicology and had a primary responsibility for the educational programs of our PhD students. I'm also a member of the training program in the Department of Pharmacology and Molecular Sciences over in the School of Medicine, and I'm also part of the training faculty for the Department of Biochemistry and Molecular Biology, which is also here in the School of Public Health. CASE 8 p.3**