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Role-Play Scenarios for Teaching Responsible Conduct of Research: Assessment of Outcomes

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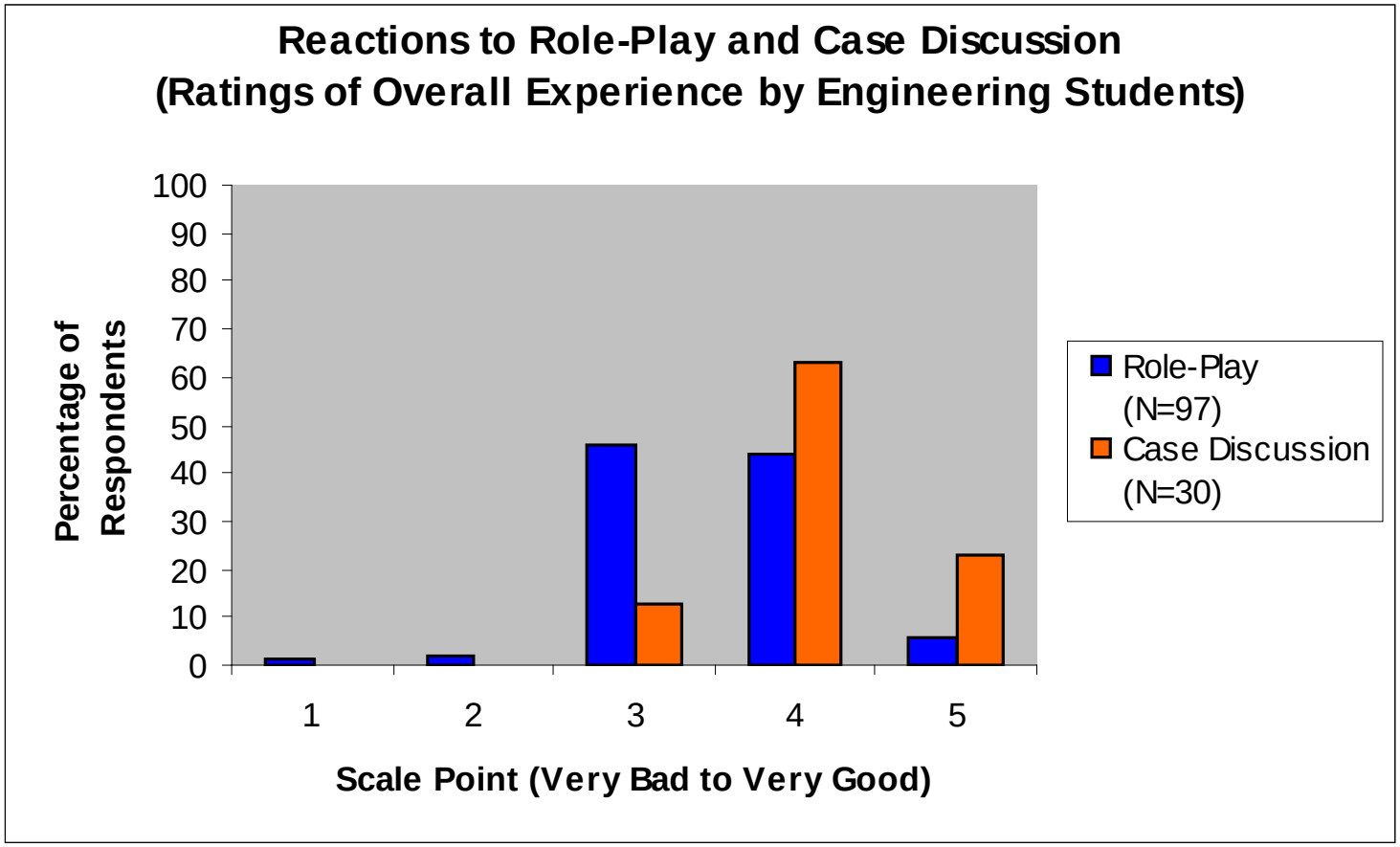
Role-Play Scenario Development

- We previously developed nine role-play scenarios
  - Authorship, Conflict of Interest, Mentoring, Peer Review, Human Participants, Animal Subjects, Hazardous Substances, Professional Relationships, and Data Management
- Pilot tested with science and engineering graduate students
  - 576 participants in 14 departments/groups

Formative Assessment: Reactions



Formative Assessment: Reported Advantages

- Captures attention; provides motivation
- Teaches multiple perspectives
- Students valued communication and negotiation skills more than RCR content
  - *"It seems like "ethics training" could be subsumed by good assertiveness training plus a set of ethical guidelines. The biggest problem people will have is not identifying unethical situations but dealing with others who perhaps have power or influence over them and do not act ethically."*

Research Questions

- Compared with current best practices in RCR training (for example, a case discussion) how effective are role-play scenarios in teaching the responsible conduct of research?
  - How do participants' conceptions of RCR change?
  - Role-play covers fewer RCR content areas than a case discussion. Does this impact case analysis ability?
    - How can we reliably measure this ability?

Summative Assessment Method

- Compared role-play with case discussion
  - 17 role-play participants, 13 case discussion participants
  - Minimum 2 months elapsed since session
    - Majority (25) > 4 months; Average > 6 months
- Interviews to assess long-term reactions and changes in conception of RCR
- Case analyses to assess learning retention

Interview Results

- **Role-Play Participants**
  - Valued listening to others' perspectives and thinking about how they would resolve the issue
  - Stressed the importance of "knowing all of the information before acting"
- **Case Discussion Participants**
  - Valued seeing examples of RCR dilemmas
  - More doubt about the relevance of the cases to their current research roles
  - More concern about being taught what the "rules" are
    - *…if you follow all the rules you don't have to worry about getting in trouble or having something come back to get you.*

Case Analysis

- Subjects read a case and then “think aloud”
  - *What are the issues?*
  - *Describe the various viewpoints.*
  - *What would you propose as a solution?*
- We developed behaviorally-anchored rating scales (BARS) to score participants on three criteria
  - Identify Moral Issues
  - Understand Multiple Perspectives
  - Negotiate Practical Solutions

Case Analysis: Peer Review

- *The Journal of Cool Results* sends Dr. Slater a manuscript to review. The manuscript is from a competitor's lab, and the title indicates that the work closely resembles the work Slater and student Parker intend to publish.
- Slater decides that he can be objective in his review. After his initial review, he asks Parker for her comments. The two agree that the data are not convincing. Slater returns the manuscript with his recommendation that it not be accepted for publication.
- Slater suggests that Parker apply a new technique that was described in the manuscript to her own research. *

* Case is from National Academy of Engineering's Online Ethics Center http://www.onlineethics.org/cms/5780.aspx

Sample Statements: Low Score

- **<u>Understand Multiple Perspectives</u>: Low Score**
  - *I was thinking how awful it would be for the advisor to do something like that to you…and I'm trying to imagine the advisor feeling like that was actually okay.*
  - *The rival lab, who obviously would like to take all of the credit for this and could possibly, selfishly, not want this lab to use these techniques at all – they might have preferred to keep this completely secret just to slow their competitors down.*

Sample Statements: High Score

- **<u>Understand Multiple Perspectives</u>: High Score**
  - *The student wants to trust her advisor but is concerned it isn't right not to attribute credit where credit's due.*
  - *The journal, basically trusted him to be objective and act in an ethical manner.*
  - *The rival lab is concerned about getting biased reviews; they're concerned about getting credit for their work.*
  - *Maybe there's some sense of "I'm really doing this to help my student."*

Behaviorally-Anchored Rating Scale (BARS) Sample

Understand Multiple Perspectives

1_____

States that there is no excuse for the behavior of one or more of the parties.

3_____

Lists the viewpoints of the parties as they are presented in the case. The student indicates that one perspective is “more correct” than other perspectives.

5_____

Presents a balanced view from the perspective of several involved parties, above and beyond those named directly in the case. States the different attitudes, values, and possible motives of the parties.

Results: Rater Agreement Using BARS

Raw Agreement Index:

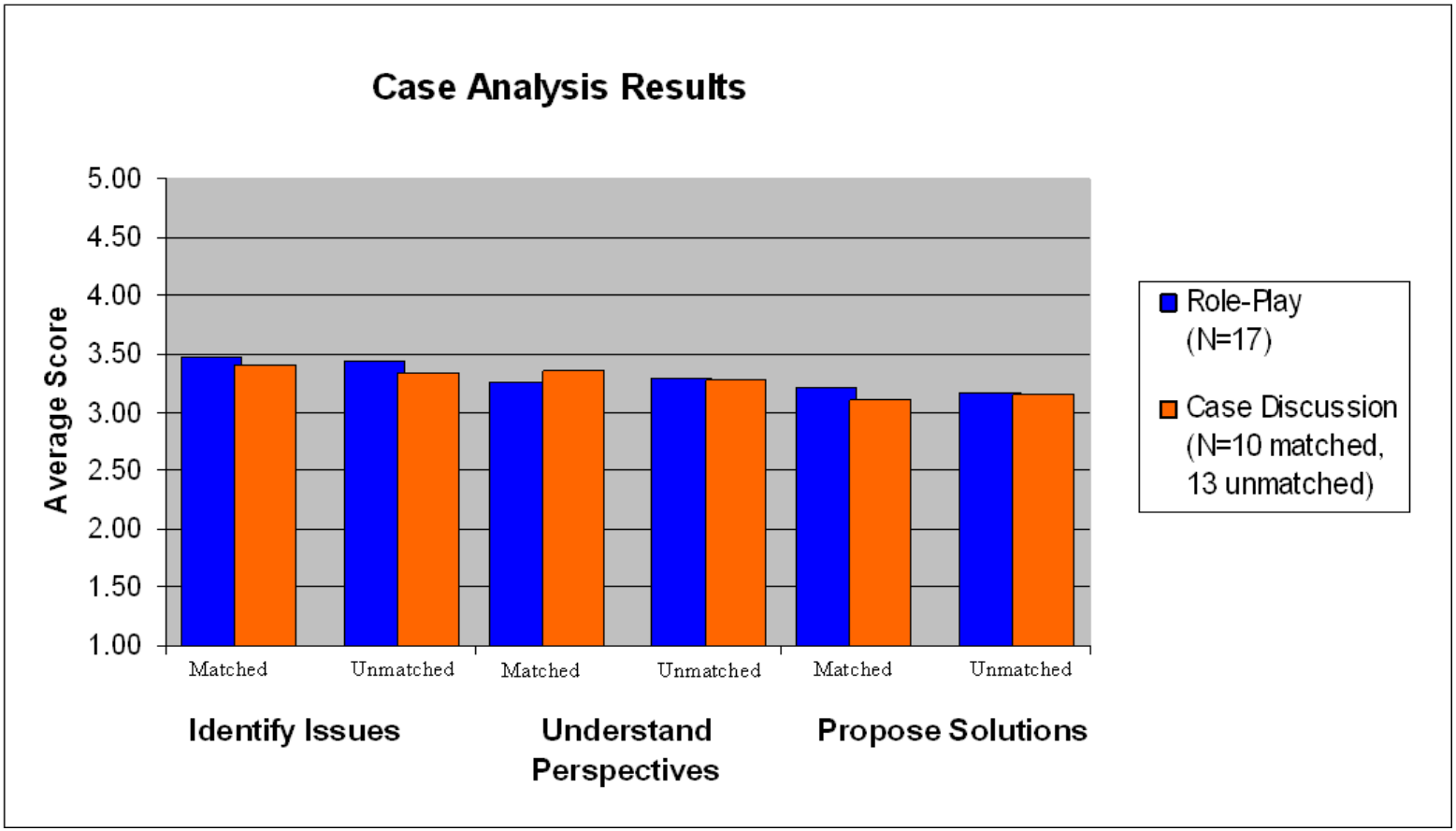
Score Differences Between the Two Raters

	Percentage of All Ratings
Perfect agreement	0.40
1 point disagreement	0.51
Greater than 1 point disagreement	0.09*

Note. Percentages across total of 186 ratings (31 subjects, 2 cases per subject, 3 ratings per case)

* Only one rating differed by more than 2 scale points.

Results: Case Analysis Performance



Conclusions

- Reactions to role-plays were generally positive (or neutral)
- Students' ability to analyze cases can be measured reliably
- Compared with case discussion participants, role-play participants
  - Perform as well on subsequent case analyses
  - Make qualitatively different statements regarding RCR instruction
    - Students value the motivation that role-play provides, and building communication skills for resolving issues, rather than compliance with rules

Role-Play Website

https://netfiles.uiuc.edu/loui/shared/NSFEESE06/