Creating Ethical Environments

SENSITIVITY TO RESEARCH MISCONDUCT: A CONCEPTUAL MODEL

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Abstract: Ethical sensitivity research suggests techniques for assessing people's sensitivity to research misconduct (RM). Based on our prior work in assessing ethical sensitivity, we present a conceptual model for assessing RM sensitivity. We propose conceptual and operational definitions of RM sensitivity (RMsen), and consider how the construct could be measured. RMsen is conceptualized as a cognitive ability, a skill which can be learned and assessed. RMsen involves an awareness that the research situation presents the possibility for misconduct to occur, and that one may have to decide what is right or wrong in the situation. Indicators of RMsen can take many forms and represent multiple content domains and dimensions. Four main content domains of RMsen are situational characteristics, RM issues, consequences, and stakeholders. In addition, linkages are potential connections made among elements in the different content domains. Three dimensions applicable to assessing RMsen include time, breadth, and depth. Although our focus is on RMsen, we believe that our model and methods may be extended to assessing sensitivity to the responsible conduct of research.

Keywords: Research misconduct; scientific misconduct; ethical sensitivity; research ethics; responsible conduct of research; RCR.

INTRODUCTION & OBJECTIVES

Research misconduct in the health sciences has significant ramifications. Concern about and attention to research misconduct has been on the rise, and in 2006 Eric Poehlman became the first researcher to receive a prison sentence for research misconduct (RM). Standing in contrast to RM is the responsible

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conduct of research (RCR). Clearly both RM and RCR revolve around ethical behaviors. Because thinking about ethical issues is critical to avoiding RM and enhancing RCR, it is important to assess how well researchers perceive the ethical issues in their research environments. Research in ethical sensitivity suggests techniques for assessing people's sensitivity to RM. If RM (or RCR) sensitivity can be assessed, RM and RCR training programs can be better evaluated. Training has the potential not only to reduce the harms associated with RM, but also to increase the benefits associated with RCR.

This article presents a conceptual model to guide the assessment of RM sensitivity. The model is based on our prior work assessing ethical sensitivity. After discussing the theoretical foundation, we propose conceptual and operational definitions of RM sensitivity and consider how the construct could be measured. Although we focus here on RM sensitivity, we believe our model and methods may be extended to assessing RCR.

CONCEPTUAL/THEORETICAL FOUNDATION

James Rest7, 8 presented a model outlining the processes involved in moral behavior. A cognitive developmental psychologist, Rest followed Kohlberg's stage theory of moral development, but did not assume the stages follow an invariant progressive sequence. Rest's model of moral behavior is comprised of four components, the first of which is particularly germane to RM sensitivity. The four components are (1) interpreting the situation, (2) determining what course of action would best fulfill a moral ideal, (3) deciding what one actually intends to do by selecting among competing moral and non-moral values, and (4) executing and implementing a plan of action. Although the components and the processes they represent are logically ordered, the model is not necessarily linear. Importantly, research can focus on any one or more of these components. As a general model, this is applicable to diverse situations, and supports parsing out the complex processes that go into making and acting on a moral decision.

We have successfully adapted Rest's model to the mass media and to the organizational communication context. Our work is informed by an information processing approach, which studies the attention, selection/storage, integration, and evaluation of information. 9-10. Our Component 1 research addresses people's sensitivity to ethical issues in the television news1, 2, 3, 4, 5 and organizational communication contexts6. The Component 2 work investigated viewer evaluations of media content and whether the news story should be run11, 12. The Component 3 research12 demonstrated that viewers decide what to do, based on their evaluations of the story, and can suggest behaviors they may enact, whereas in studying Component 4, we found that viewers differ in their reported actual behaviors toward TV news and their justifications for such actions12, 13.

Adapting the model to the research environment

The research environment is but one of many contexts to which Rest's model can be adapted. As with the original, our adaptation (see Figure 1) is logically

Figure 1: Understanding and responding to research misconduct: A preliminary four-component model
Ethical Sensitivity Research

Having explained Rest's model, we will describe previous ethical sensitivity research before providing our definition of RM sensitivity. We identify three main strands of ethical sensitivity research. The dominant strand is most closely linked to Rest's model. Rest, Bebeau and colleagues developed the Dental Ethical Sensitivity Test (DEST) and found that it reliably assesses ethical sensitivity among dental students and practitioners. Besides our own work applying this concept to the media and organizational communication contexts, ethical sensitivity has been investigated in a number of other contexts. Flower studied psychologist gender and level of moral sensitivity. Clarkeburn studied ethical sensitivity in relation to scientific practice. Erozy and Gündogmus focused on sensitivity to specific ethical issues: respect for autonomy, non-maleficence, beneficence, and justice. Brabeek et al. created the Racial Ethical Sensitivity Test, examining sensitivity to ethical issues related to race and gender. A subset of this primary research strand considers how education affects ethical sensitivity. Bebeau and Myyry and Helkama found that ethical sensitivity could be increased through education. Interestingly, Sadler suggested that unless course work is focused on the ethical aspects of a specific discipline, it may have little effect on moral sensitivity to issues in that discipline.


which they are confronted. For instance, Swenson-Leppe found that manufacturing plant workers were more sensitive to ethical issues pertaining to manufacturing, whereas teachers were more sensitive to issues related to hiring practices.

UNDERSTANDING RM SENSITIVITY

Our definition of RM sensitivity (RMsen) is guided by the definition of ethical sensitivity presented by Bebeau, Rest, and Yarno. It addresses the conscious choice of means and ends by those involved in or observing a situation, the significant impact of one's actions on others, and the applicability of standards of right and wrong.

Conceptually, we define RMsen as an ability that involves an awareness that something someone might do or is doing in the research environment can or should be considered in terms of whether it is consistent or inconsistent with a general practice, regulation, or commonly held standard; this can affect others' welfare directly or indirectly. RMsen involves an awareness that the research situation presents the possibility for misconduct to occur, and that one may have to make a decision regarding what is right or wrong in the situation. Our definition of RMsen is multi-pronged; it includes one's own actions or the actions of others; potential or actual behaviors; and violating or upholding ethical research practices.

Our previous work as referenced above has argued that ethical sensitivity can be evidenced by any number of “indicators.” By extension, indicators of RM sensitivity are broadly defined, operationally, as verbalizations of discrete relevant concepts or the relationships among these concepts. Indicators of RMsen, in practice, are likely to take many forms. These include, but are not limited to, the ability to comprehend and understand a situation in terms of the action, the actors involved, and the goals and motivations of participants; recognize as conscious choices the decisions (in terms of means, ends, and actions) made by participants in the situation; perceive the possible positive or negative consequences of decisions; be aware that such choices can or should be evaluated on a right-wrong dimension; recognize the rights and responsibilities of the stakeholders; notice the special circumstances that may affect participants; perceive research misconduct as such, rather than considering the problems and decisions as mundane research issues; and an awareness of differing (perhaps competing) values, goals, interests, meanings, and interpretations of the situation.

More specifically, as reflected in Figure 2, RMsen indicators may be broadly understood as representing multiple content domains and dimensions. We posit that there are at least four main content domains comprising RMsen. Situational characteristics include acknowledgment of relevant elements, actions or contextual features of the research situation being considered. An RM issue is an acknowledgement that a behavior may fall along a right-wrong continuum, or may affect the welfare of others positively or negatively. Consequences are any effects of the RM issue on people, situations, actions, or ideas. Stakeholders are the parties (individuals, groups, institutions) that may feel the consequence of an RM issue. In addition, linkages are the connections made among the situational characteristics, RM issues, consequences, and stakeholders. The linkages represent the relationship among the four content domains.

We also propose three dimensions applicable to assessing RMsen. The time dimension reflects how quickly or spontaneously RMsen indicators are exhibited. An individual with greater RMsen may address the possibility of research misconduct more readily than will an individual with lower RMsen. The breadth dimension, likely the most complex of the RMsen dimensions, reflects the range of different RMsen indicators. Higher levels of RMsen may be associated with an increased number of indicators. The depth dimension refers to the amount of thought or detail in the RMsen indicators. Greater RMsen may be associated with more well-developed presentations of RMsen indicators.
**POSSIBLE METHODS FOR ASSESSING RM SENSITIVITY**

Researchers may wish to assess RMsen for a variety of theoretical or applied purposes. Two crucial decisions facing anyone interested in assessing RMsen are how to collect subjects' responses and how to analyze the responses.

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**Data Collection**

Data may be collected using paper-and-pencil measures, interviews, or any variants thereof. For example, researchers may employ interactive computer methods in which subjects type written responses, or may ask subjects to speak their responses into a recording device. Response options may be forced-choice (e.g., ratings or Likert-type scales) or open-ended. Follow-up questions may be part of the protocol. All of these methods have been used in ethical sensitivity and moral sensitivity research, and all of the standard strengths and limitations of those methods apply.

Measuring or evaluating an individual's sensitivity to these types of issues presents an additional concern. One defining characteristic is whether subjects complete a recognition task or a production task. A recognition task typically involves a closed-survey with Likert-type items. A production task, often done in interview or written form, is more open-ended and asks subjects for their thoughts about the stimulus material. As do Rest and Sirin, we favor production tasks. Recognition tasks may be useful in understanding other processes in Rest's Four-Component model, but they seem ill-suited to assess the sensitivity component. To understand sensitivity to the underlying issues, we must understand whether and how subjects apply their own knowledge and inner resources.

In particular, we favor the use of a funnel-type structure applied in an interview setting. The interview should begin with broad questions, and the interviewer should not introduce the issue of misconduct until later in the discussion. Applying this method to assessing RMsen, we might first ask subjects to describe the situation, to highlight what stood out to them in the situation, and to evaluate what any participant should do in the situation. Only then might we ask subjects whether actual or potential behaviors could be considered misconduct (or responsible conduct), and if so, why, who might be affected, and how. The funnel-type interview can gauge the extent to which subjects addressed the relevant issues without being prompted to do so, thus allowing consideration of the time dimension.

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Data Analysis

Analysis of subjects' responses can be quantitative or qualitative; analyses can generate scores, or identify relative areas of strength and weakness. Analyses can be diagnostic, especially if integrated into a particular educational experience.

Our prior work referenced herein has assessed ethical sensitivity using a variant of cognitive mapping, a qualitative technique allowing visual representation of relationships between subjects' verbalized concepts or events. Originating in studies of learning and decision-making\(^\text{32, 33}\), cognitive maps present concepts and causal beliefs, and can display complex chains of reasoning. Concepts are represented as points, and causal beliefs are arrows connecting the points.

Cognitive maps can only represent verbalized thoughts, and the coding can be somewhat subjective. However, cognitive maps can both provide lists of criteria or rules and reveal some structure of a thinking or decision-making process. They impose neither a priori structures on verbalizations, nor researchers' assumptions of what someone's concepts or labels for a situation might be\(^\text{33}\). Cognitive maps can model the schemata subjects apply when interpreting any given situation\(^\text{34}\). Though cognitive mapping is primarily used in qualitative research, our variant of the mapping process and our conceptualization of RMsen indicators can generate data amenable to quantitative analyses\(^\text{6}\).

ASSESSING RM SENSITIVITY: PROBLEMS AND PROSPECTS

Several challenges face researchers and instructors who may wish to approach assessing RMsen from the perspective we propose, including the difficulty of creating appropriate (concise, effective, realistic) stimulus material. Using a production task makes the data gathering process time consuming and laborious, and requires the development and application of a coding system which might be usable only for one stimulus.

However, the potential advantages of our approach may warrant overcoming those challenges. Most importantly, RMsen is conceptualized as a cognitive ability; it can be learned, and it can be measured. Therefore our approach has implications for RM training programs. We argue that our general model will apply equally well to the responsible conduct of research (RCR). Each of RCR's nine conceptual domains\(^\text{32}\) provides an educational opportunity, the results of which could have significant impact, could reduce the occurrence of research misconduct, and can be measured. Thus, a second advantage of the proposed approach is inextricably tied to the first: our model and methods can also be applied to sensitivity to the responsible conduct of research, which we call RCRsens. The combination of funnel-type interview and cognitive mapping could be used to diagnose and address an individual's specific RMsen or RCRsens strengths and weaknesses.

A third advantage to our approach is that it is grounded not only in theory but also in data. We derive conceptual support from Rest's Four-Component model, but the precise indicators of RMsen are drawn from subjects' verbalizations. Our variant of the cognitive mapping technique seems in itself a fruitful analog of the production tasks we favor. Our technique provides for maximum flexibility and minimal intrusion during the creation and analysis of people's response patterns. Finally, unlike the DEF\(^\text{13}\), our approach does not require coders to be prior experts or professionals in the field. With training, anyone who would be likely to want to learn this system should be able to do so.

In conclusion, we have proposed a conceptual model of sensitivity to research misconduct and suggested a method for assessing RMsen. We believe our model and methods are also applicable to assessing sensitivity to the responsible conduct of research. The obvious next step is to apply our model and methods to an RMsen or RCRsens scenario. Because prior research has shown that ethical sensitivity is both highly contextual and influenced by education, developing a means of assessing RMsen may provide valuable feedback on the efficacy of education about research misconduct and the responsible conduct of research.

We see two viable approaches for measuring RMsen using the techniques presented here. First, RMsen could be examined holistically, where all the conceptual domains related to the responsible conduct of research could be examined simultaneously. This may be desirable, but it is complex and premature.


\(^{35}\) Data acquisition, management, sharing and ownership; conflict of interest and commitment; human subjects; animal welfare; research misconduct; publication practices and responsible authorship; mentor-trainee responsibilities; peer review; collaborative science.
Thus we propose a different approach — to examine sensitivity to issues in just one of the nine RCR conceptual domains, such as conflict of interest and commitment. Though the process could be used for any RCR domain, we will begin by applying our general model and method to assess conflict of interest sensitivity (COIsen). We will conceptually and operationally define COIsen, create relevant scenarios to test COIsen, pre-test them on a small number of subjects, and derive cognitive maps (which could be analyzed qualitatively or quantitatively) from interview transcripts. After the scenarios, interview process, and mapping systems are validated, the process could be used on a larger sample to answer specific research questions or hypotheses. Alternatively, the process could be applied on a small scale, such as assessing the efficacy of RCR educational efforts. Assessing one RCR component at a time can readily be incorporated into classroom-based, online, or other training programs, and represents an important application of the model and method.

Extending the pedagogical application of the model and method, the cognitive maps could be used diagnostically, to assess relative strengths and weaknesses in a variety of learning situations. For example, Bebeau14 described how the Dental Ethical Sensitivity Test (DEST) has been used to assess the ethical sensitivity of practicing dentists, including those who have been referred by the state dental board for remedial courses. Using RMsen cognitive maps diagnostically could help in the development of more thorough and effective training methods for those conducting scientific research. The maps could be used in highly individualized applications. For example, cognitive maps could indicate whether a new employee had good understanding of the key RCR issues presented in a particular research situation; if any deficiencies were identified they could be addressed.

While the process for creating and validating the method is costly, if it is an effective diagnostic tool, it could reduce the significant costs related to research misconduct.

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Creating Ethical Environments

THE TEACHING SCHOLARS PROGRAM: A PROPOSED APPROACH FOR PROMOTING RESEARCH INTEGRITY

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Abstract: All research environments are not created equal. They possess their own unique communication style, culture, and professional mores. Coupled with these distinct professional nuances is the fact that research collaborations today span not only a campus, but also the globe. While the opportunities for cross cultural collaborations are invaluable, they may present challenges that result in misunderstandings about how a research idea should be studied and the findings presented. Such misunderstandings are sometimes found at the center of research misconduct cases. And yet in light of highly visible cases of research misconduct, the attitude about ensuring research integrity remains rather opaque. This paper discusses the merits of the Teaching Scholars Program as a mechanism by which to promote research integrity. This paper will examine this education program against the backdrop of the US Office of Research Integrity (ORI), as an established office responsible for ensuring the integrity of federally funded biomedical and behavioral research.

Keywords: Research misconduct; education; responsible conduct of research; Teaching Scholars Program; Office of Research Integrity

INTRODUCTION

Cases of scientific misconduct in biomedical research that occurred in the 1980's drew the federal government into a role that was not anticipated by researchers. As cases of research misconduct unfolded, it was clear that federal funding for biomedical research could be in jeopardy if public trust was not secured vis-à-vis the establishment of some form of oversight body. Because funding agencies were not equipped to address allegations of research

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