Theme:
Scientific Ethics

An Evidence-Based Guide for Ethics Instruction †

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Drawing from multiple sources of evidence, this paper updates previous descriptions (IOM, 2002) of measurement strategies and teaching techniques to promote four theoretically derived abilities thought to be necessary conditions for the responsible conduct of research. Data from three samples (exemplary professionals, professionals disciplined by a licensing board, and graduates who completed an ethics program designed to promote the four interrelated abilities) suggest that development of a *moral identity* that is consistent with the norms and values of a profession is the driving force that gives rise to *ethical sensitivity*, *ethical reasoning*, and *ethical implementation*. Evidence from the cited studies supports the usefulness of the theoretical model to (a) deconstruct summary judgments about character and see them as abilities that can be assessed and developed; (b) guide the design assessments that are sensitive to the effects of interventions; and (c) augment previous IOM recommendations for the development of meaningful learning activities.

INTRODUCTION

In Chapter 5 of *Integrity in Scientific Research* (19), the Institute of Medicine (IOM) Committee described a theory-driven, evidence-based approach to designing instruction in the responsible conduct of research that would "maximize the likelihood that education … would influence individuals and institutions rather than merely satisfy an item on a 'check-off' list for that institution." The recommended model for education included these principles:

1. The educational program should be built around the development of abilities that give rise to responsible conduct. These include the ability to: 1) identify the ethical dimensions of situations that arise in the research setting and the laws, regulations, and guidelines governing one's field that apply (*ethical sensitivity*); 2) develop defensible rationales for a choice of action (*ethical reasoning*); 3) integrate the values of one's professional discipline with one's own personal values (*identity formation*) and appropriately prioritize professional values over personal ones (showing moral motivation and commitment); and 4) perform with integrity the complex tasks (e.g., communicate ideas and results, obtain funding,

teach, and supervise) that are essential to one's career (*survival skills*[a]).
2. The program should be designed in accordance with basic principles of adult learning.
3. The instruction should be provided as much as possible by faculty who are actively engaged in research related to that of the trainees.

In Chapter 5 (19), the four abilities—drawn from Rest's (20) Four Component Model of Morality (FCM)—are operationally defined. Each is seen as a mix of cognitive and affective processes that contribute to the component's primary function[b]. Following the definitions, research conducted in professional education settings is summarized, and teaching strategies, assessment methods, and guidelines for designing cases to promote development of the abilities in the research setting are described. Since the IOM report also addressed the institutional culture that either enables or impedes researchers' ability to act at the leading edge of their ethical competence, a separate appendix (18) described outcome measures that could be used or

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[a] Here the term *skills* is not used in the narrow sense that suggests a dichotomy between knowing and doing.

[b] Rest and colleagues (12) argue against the usual tripartite view that assumes that the elements to be studied and assessed are attitudes, knowledge, and behavior. When researchers have attempted to study the connection among these elements, they usually do not find significant connections and are left with the conclusion that attitudes have little to do with knowing and behavior is often devoid of thinking and feeling. A more profitable approach, as Rest proposed, and as illustrated by studies cited herein, is to study functional processes that must arise to produce behavior.

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adapted (a) to study organizational culture and (b) to study the ethical competences of individuals. Potential outcome measures referenced in Chapter 5 are fully described in Appendix B (18).

Following publication of the IOM report, Michael Zigmond and I prepared a document (Appendix 1) to illustrate how the guidelines for designing cases to promote the four abilities could be applied to a set of circumstances that might arise in the research environment. Since publication of the IOM report (17), new findings have emerged that have implications for the structuring of a professional ethics curriculum. Early studies cited in the IOM report had shown that the abilities were independent of one another, as Rest (20) had predicted. In other words, competence in one did not predict competence in another, and a shortcoming in a single ability could account for a moral failing. This paper provides summaries of findings for each ability as well as new evidence as to their interconnectedness. Following implications for education, the Summary and Conclusion section expands on earlier recommendations for structuring education and assessment to promote the responsible conduct of research.

Ethical sensitivity

Studies using well validated measures of ethical sensitivity illustrate that competence in the ability to interpret the moral dimension of professional problems is distinct from the ability to apply professional norms and values to determine what ought to be done. What is clear from the research is that if one fails to see the moral issue in a professional problem, competence in reasoning and problem solving, even if well-developed, are not brought to bear (3, 5, 26). Further, just as students and professionals show remarkable variability in their level of moral reasoning development (see next section), they also vary greatly in their ability to interpret patient/client characteristics and professional responsibilities embedded in ethical sensitivity tests. Finally, ethical sensitivity can be influenced by educational interventions (3, 5), and, in some settings (26), researchers have observed small, though statistically significant gender difference favoring women.

In a meta-analysis of ethical sensitivity research (26), researchers identified 37 studies in which 23 measures were described to assess ethical sensitivity in professional settings (e.g., dentistry, medicine, nursing, professional psychology, business, and science). After classifying the measures along several dimensions, including the extent to which the construct was elicited by the stimulus materials, they concluded that only seven of the measures met criteria, and most had not been extensively validated. Examples of validated measures that elicit the process include the Dental Ethical Sensitivity Test (DEST) designed for dentistry (6, 11) and the Racial Ethical Sensitivity Test (REST) designed for counseling psychology (13, 22).

What distinguishes measures like the REST and DEST is the extent to which the stimulus presents clues to one or more moral problems without ever signaling either the moral issues at stake or the particular professional responsibilities called for. By way of contrast, some test designers seem to conceptualize "ethical sensitivity" as the ability to simply name the moral issue when a condensed synopsis of a moral problem is presented. Examples in Appendix 1 show how distinctly different the stimulus for assessing ethical sensitivity is from the stimulus for assessing moral reasoning development.

Ethical reasoning and judgment

The IOM report (18) described the usefulness of the Defining Issues Test (DIT) for assessing students' capacity for reasoning about moral issues. Subsequent reviews (2, 9) update that literature and describe use of the DIT to assess (a) the reasoning development across and within professions, and (b) the effectiveness of interventions to promote moral judgment development. As described below, the measure is used in remediation programs to identify shortcomings in ethical decision making of practicing dentistry (4) and medical (7) students. Strategies for assessing students and giving individualized feedback on reasoning development are included in chapter appendices (7).

In addition to life-span measures of moral judgment development like the DIT, researchers have designed measures of ethical reasoning for specific educational contexts. Referred to as Intermediate Concept Measures (ICMs), because they assess ethical concepts in the intermediate zone between broad moral ideals and profession-specific codes of conduct (e.g., professional autonomy, informed consent), ICMs present discipline-specific problems and assess agreement between respondents and experts as to the appropriateness or inappropriateness of particular action choices and justifications. It is important to note that test developers engage respondents from the discipline to generate items. Thus, even items viewed by experts as inappropriate have a ring of authenticity.

An analysis of results from multiple ICM measures across populations (adolescents, young adults, and professionals) (24) revealed that irrespective of the sample, age group, or ICM concept assessed, respondents had more difficulty identifying the "bad" choices/justifications than the "good" items. In addition, the obtained mean differences suggested different levels of performance, as there was little to suggest that these findings were due to methodological issues. Further, it appeared that identifying inappropriate and appropriate choices or justifications were not poles on a single dimension, as participants seemed not to apply information and experience gained on one set of considerations to the other. These findings raise questions about the focus of ethics education. Perhaps instruction focuses on what one ought to do and what are appropriate choices, and individuals must then infer what is inappropriate and poorly

conceived. If so, ethics education may benefit by expanding its focus on inappropriate choices in order to provide more guidance in developing an experiential base to support more optimal moral decisions. Alternatively, these findings may have implications for identity formation, described next.

Moral motivation and commitment

When Rest proposed his FCM of moral functioning in the early 1980s, moral motivation was featured, though less well articulated than the other three components. Rest (20) thought that moral motivation influenced moral action directly and in interaction with the other components of the moral system. In the last decade, considerable attention has been given to the study and measurement of life-span identity formation—particularly in the professions. In an edited volume on moral motivation, researchers (23) summarize early and more recent efforts to operationally define and measure moral motivation. Measures include the Professional Role Orientation Inventory (PROI) described in the IOM report (18), and the theoretical importance of a newer measure (the Professional Identity Essay [PIE]) used to assess life-span identity formation in dentistry (10) and law (16) and recently adapted for ethics remediation in medical education (7). Note: In addition to providing guidance on the use of the DIT, chapter appendices (7) include the PIE, adapted for medicine, and criteria for assessing and strategies promoting identity formation.

In the same edited volume, researchers (8) summarize evidence from dentistry, medicine, law, and the military that supports constructivists' theoretical understanding of a developmental continuum of moral motivation and commitment (Rest's Component 3). The continuum proceeds from self-interest and concreteness of thought characteristic of entering professionals—including entrants into doctoral education programs (1) to more other-oriented and abstract ways of making sense of the self in relation to others. At advanced levels of moral motivation, the exemplary individual's personal and professional moral values (14, 21) are fully integrated, as evidenced by behavior that is consistent across contexts and situations. For example, the exemplary dental professionals studied by Rule and Bebeau (21) were able to articulate the public duties of their profession, integrate them with personal value frameworks, and regularly and consistently engage in socially responsible actions. The identity of such exemplary professionals was contrasted with the identities of entering students and entering professionals across several professions (reviewed by Bebeau and Monson [10]) and with professionals who have been disciplined by a licensing board (5). A consistent shortcoming of all but two of 41 professionals referred for an ethics assessment because they violated laws governing professional practice was in the ability to articulate professional duties and responsibilities. Whereas referrals demonstrated a great deal of variability on measures of ethical sensitivity, moral reasoning, and ethical implementation, they consistently demonstrated only vague notions of their responsibilities to patients, their profession, their community, and society.

The importance of professional identity formation to professional practice is further supported by a reexamination of data from a study of gender differences (25) on measures of the four ethical abilities (ethical sensitivity, reasoning, role concept, and ethical implementation) for five cohorts who participated in a well-validated four-year dental ethics education program. The researchers (Bebeau and Thoma, in preparation) noted that those graduates who had developed a mature professional identity by graduation also had developed high levels of competence on measures of the other three components (ethical sensitivity, reasoning, and implementation). Taken together, evidence from the three samples (exemplary professionals, disciplined professionals, and recent graduates who completed an ethics curriculum) strongly suggests that development of a moral identity that is consistent with the norms and values of the profession is the driving force that gives rise to the development of other abilities that account for responsible professional conduct. Whether ethical sensitivity, reasoning, and competence in implementing ethical solutions develop in tandem with the development of a moral identity is a question for further research.

Moral character and competence

As noted in the IOM report (19), developing self-regulation, self-efficacy and implementation abilities is necessary for effective and responsible professional practice—what Fisher and Zigmond (15) describe as "survival skills" in the responsible conduct of research. A wide variety of assessment strategies is possible. In the dental ethics curriculum (25), competence in ethical implementation was based on performance score for eight complex cases presented during the last two years of the dental ethics curriculum. Stimulus for assessment was similar to DEST cases in that students needed to: 1) interpret the facts that must be addressed if the problem is to be resolved efficiently; 2) design an action plan; and 3) create a dialogue to illustrate effective plan implementation. Checklists prepared and validated to assess performance assured uniformity in judging responses. All responses were assessed by the same rater, and students could challenge the assessment, revise, and resubmit. Like other assessments used in the curriculum, researchers observed considerable variability with no ceiling effect for the measure.

An unexpected finding (25) was an observed gender difference in ethical implementation for the 60 men and 60 women randomly selected from five cohorts (25) to explore previously observed gender differences (favoring women) in ethical sensitivity and moral reasoning. No gender difference was observed on ethical sensitivity, and pretest and posttest differences on moral reasoning were trivial. Whereas men and women had similar scores on the responsibility dimension of moral motivation (PROI scores)

at entrance to professional school, at graduation, an effect size of 0.75 for women versus 0.5 for men indicated greater change for women. A statistically significant gender difference, favoring women, was also evident on the measure of moral implementation, though pretest data were not collected to judge the role of general implementation abilities (e.g., interpersonal effectiveness, problem solving, etc.). An effect size of 0.57 suggested that the women's ability to implement more effective action plans was not a trivial difference. Recall that a reanalysis of this data set (Bebeau and Thoma, in preparation) suggests that those students with a highly developed sense of professional identity also scored high on the measure of ethical sensitivity, reasoning, and implementation. Given that the observed gender differences were not anticipated, replication with other cohorts and measures is indicated.

Implications for education

An ethics education program of moderate duration (9, 25) can facilitate development of the four abilities described by the IOM report, provided attention is directed to the educational principles the report outlines. In addition to the effect sizes reported for the undergraduate dental ethics curriculum (25), enhanced ethical competence was also achieved for professionals referred for assessment/instruction as a condition for license renewal.

Of the 41 dentists referred over a 20-year period (5, 4), two were exempt from instruction based on pretest performance on the five well-validated measures of the FCM (the DEST, DIT, DERJT, PROI, and Role Concept Essays [RCE]) and 38 completed an individualized course designed to remediate deficiencies in ethical abilities identified at the pretest. Statistically significant pre- to posttest changes (effect sizes ranging from 0.55 to 5.0) were reported (5) for ethical sensitivity (DEST scores), moral reasoning (DIT scores), and role concept (RCE essays and PROI scores). Analysis of the relationships between ability deficiencies and disciplinary actions supported the explanatory power of Rest's FCM. Of particular interest was the way the model helped the referrals to deconstruct a summary judgment about their character (as unethical or unprofessional) and to see the self as lacking in particular capacities or abilities that could be further developed. Finally, though time-consuming to implement, the individualized remediation programs were highly effective in promoting ethical competencies, in reducing recidivism, and in influencing practitioner perceptions of the programs' value.

An examination of the extensive practitioner self-assessment data (5) provides guidance for structuring instruction. Beginning the instructional process with a discussion of the distinguishing features of a profession and the expectations that follow was seen as uplifting and renewing. Further, the use of cases to assess and facilitate ethical sensitivity and reasoning was viewed as relevant to professional practice. Of particular interest was the value practitioners placed on the curriculum's emphasis on ethical implementation.

Instead of focusing on "What is happening?" and "What ought to be done?" as is typical of much ethics instruction, the courses emphasized how to implement an action plan, including what to say and how to say it. With the exception of Fisher and Zigmond's (15) work on "survival skills," this appears to be an often neglected area of ethics instruction. For students and practitioners alike, there is a clear hunger for help with strategies and language to deal with human interaction problems that have clear ethical implications. For further discussion of curriculum and resources to promote ethical implementation, see Bebeau and Monson (9).

Newly designed resources for assessing and promoting identity formation are provided in a chapter (7), in *Remediation in Medical Education.* The authors coach educators to use measures of moral reasoning and professional identity formation to provide a diagnostic assessment of a student's strengths and shortcomings in their understanding of the ethical and moral dimensions of professionalism. Next, the authors describe a remediation curriculum developed for a group of students who violated professional norms. This program has also been used to address individual transgressions (e.g., cheating, subpar behavior in practice). Lastly, the authors highlight strategies they have found effective in therapeutic interactions with individual students who present particular challenges.

SUMMARY AND CONCLUSION

Evidence from the cited studies adds weight to earlier recommendations (17) for structuring educational programs that use active learning strategies to promote the development of competent, thoughtful, and responsible scientists. It is natural to assume that students who apply for graduate education are mature individuals of good character, and our intention is not to undermine confidence in students' personal integrity. Yet the evidence (10) shows that entering students, across professions, have rather vague notions of the norms and values of their chosen profession and seem not to "pick them up" from role models during the course of their education. More importantly, recent studies (5, 25) exploring competence on each of the four ethical abilities defined by Rest's Four Component Model of Morality illustrate the critical role of professional identity formation.

Because the formation of a professional identity seems to be the primary driver behind responsible conduct, a first step in designing an educational program in responsible research conduct is to begin by *addressing the expectations of a scientist.* Ask students to respond to open-ended questions—in writing—which they can reflect upon as they learn about the values and normative practices that guide the research enterprise. By asking students to express the concepts in their own words, and in writing, misperceptions can be identified and addressed before they become an issue. Educators may wish to modify the PIE applied in medicine (7) and adapt the reflective learning activities for RCR education.

As argued in the IOM report, to develop thoughtful and responsible scientists who act with integrity and have a broad understanding of their role and a commitment to integrity in science, educators must do more than teach the rules and policies that apply to the conduct of research. Once the expectations of the scientist have been clarified, it is important to engage students in active learning (using cases, if possible) to facilitate the abilities that are necessary conditions in addition to a professional identity—ethical sensitivity, reasoning, and problem solving—for effective moral action. When selecting or designing case materials, the materials must be carefully structured to elicit the process of concern. As argued above, too often cases are written and participants are asked: What should the protagonist do? Such a question focuses on problem solving rather than problem identification or moral reasoning. Whereas a skilled facilitator may be able to redirect focus to reasoning or problem identification, it is sometimes more difficult. For this reason, we provided an example (Appendix 1) to show how to design stimulus materials that focus on the particular skill needed for effective problem identification, reasoning, or implementation. With rather carefully targeted courses of moderate duration, it is possible to show gains in each of the abilities that give rise to responsible conduct. Our goal is not to develop the more advanced skills in ethical reasoning that might result from courses in moral philosophy. Yet evidence shows that problem-based practice (using cases) can be especially effective in helping students recognize and subsequently avoid personal interest arguments while strengthening awareness and adherence to the rules of responsible research conduct.

SUPPLEMENTAL MATERIALS

Appendix 1: Developing abilities using cases

ACKNOWLEDGMENTS

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