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The independence of James Rest's components of morality: evidence from a professional ethics curriculum study

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Rest's hypothesis that the components of morality (i.e., sensitivity, reasoning, motivation, and implementation) are distinct from one another was tested using evidence from a dental ethics curriculum that uses well-validated measures of each component. Archival data from five cohorts ($n = 385$) included the following: (1) transcribed responses to a measure of ethical sensitivity collected at the end of the third year; (2) pre- and post-test moral judgment scores; (3) pre- and post-test motivation scores; and (4) implementation scores – performance on eight cases completed during the third and fourth years. Because the ethical sensitivity test had been scored by multiple raters, and interrater reliability did not meet acceptable standards, 120 portfolios were randomly selected from the five cohorts and responses were rescored prior to analysis. Correlations among the measures were low, ranging from $-.08$ to $.34$, supporting Rest's contention that the processes are distinct from one another and competence in one does not predict competence in another. The findings have implications for moral and character education programs.

Keywords: moral sensitivity; moral reasoning; moral motivation; moral implementation; professional ethics

Introduction

Rest's (1982) Four-Component Model of Morality (FCM) describes four processes thought to be independent and necessary contributors for moral behavior: moral sensitivity, moral judgment, moral motivation, and moral implementation. According to Rest (1986), if one has 'behaved morally' in a given situation, the person must have performed at least four basic psychological processes:

1. The person must have been able to make some sort of interpretation of the particular situation in terms of what actions were possible, who (including oneself) would be affected by each course of action, and how the interested parties would regard such effects on their welfare.
2. The person must have been able to make a judgment about which course of action was morally right (or fair or just or morally good), thus labeling one possible line of action as what a person ought (morally ought) to do in that situation.

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3. The person must give priority to moral values above other personal values such that a decision is made to intend to do what is morally right.
4. The person must have sufficient perseverance, ego strength, and implementation skills to be able to follow through on his/her intention to behave morally, to withstand fatigue and flagging will, and to overcome obstacles (p. 3).

The FCM has been used as the basis for the design of ethics education programs in elementary education (Narvaez 2006), in business (Cohen, Pant, and Sharp 1998; Hunter 1997; Owahoso 2002), and in the professions of dentistry (Bebeau 2002), law (Hartwell 1995), medicine (Self and Olivarez 1996), nursing (Duckett et al. 1997), and research ethics (IOM Report 2002).

Certainly, Rest saw the components of morality as applicable to children, adolescents, and adults, even though it might be more difficult to arrive at standards for judging acceptable levels of sensitivity, reasoning, motivation, and implementation. Any school-based program will attempt to influence moral sensitivity (i.e., perspective taking, predicting consequences, and so on), reasoning (what ought one to do), moral motivation and commitment (who am I and what will I do to demonstrate who I am), and implementation (how will I interact with my peers, superiors, and subordinates, i.e., what exactly will I say and do to demonstrate what I have decided I will do). For example, the FCM has been the theoretical foundation for the Integrative Ethical Education developed by Narvaez (2006) to promote character development for children. Similarly, although much of the literature in professional education focuses on the effects of ethics education on moral judgment (Bebeau 2002), researchers have shown increased interest in the other components. For example, in the last two decades, as many as 18 instruments have been developed to assess moral sensitivity (You and Bebeau 2005) in seven different professions. As for the assessment of moral motivation in the professions, two measures have been designed and validated: the Professional Role Orientation Inventory (PROI) devised for dentistry (Bebeau, Born, and Ozar 1993) and adapted for physical therapy (Swisher, Beckstead, and Bebeau 2004); and the Professional Decisions and Values Test (Rezler et al. 1992) devised to assess professional identity formation in law and medicine. In terms of assessment for moral implementation, educators describe strategies in the context of dental education (Bebeau 1994) and research ethics education (IOM 2002).

Studies investigating the relationship between measures of moral sensitivity and measures of moral reasoning (components 1 and 2) report correlations ranging from $-.21$ to $.51$ (Bebeau, Rest, and Yamoor 1985; Ernest 1990; Fedeles 2004; Fleck-Henderson 1995; Flower 1992; Lindsey 1986; McNeel and Frederickson 1999; Volker 1984). Studies have also reported correlations of measures within component 2. For example, Thoma and Bebeau (2007) reported correlations between the Defining Issues Test (DIT), a life-span measure of moral judgment development, and measures of intermediate-level ethical concepts for professionals ($.29$) and for adolescents ($.31$). To date, no study has investigated the relationship among all four components of Rest's model when data were available for student performance on measures of each of the four components.

For over two decades, the FCM has served as the theoretical base for the dental ethics curriculum (Bebeau 1994) in a large Midwestern University in the United States and for the design of a measure of ethical sensitivity (the Dental Ethical Sensitivity Test [DEST], Bebeau and Rest 1983), a measure of moral motivation (the PROI, Bebeau, Born, and Ozar 1993), and a measure of moral implementation [scores in a course in Professional Problem

Solving (PPS)]. Use of these measures, together with the DIT (Rest 1979), enabled the authors to study the following unresolved question: what is the interrelationship among the professional students' moral sensitivity, moral reasoning, moral motivation, and moral implementation?

This study investigates Rest's (1982) claim that the four components of morality are distinct from one another. In other words, competence in one does not predict competence in another. The investigation is possible because individual course portfolios were archived for each cohort of professional students who completed measures of each of the components during the course of their 4-year ethics curriculum. Scores on the different measures for the four components are as follows: (1) moral sensitivity as measured by the DEST (Bebeau and Rest 1983); (2) moral judgment as measured by the DIT (Rest 1979); (3) moral motivation as measured by the PROI (Bebeau, Born, and Ozar 1993); and (4) moral implementation as measured by students' performances in a course in PPS.

Methods

The measures

Because evidence of the construct validity is an essential consideration when examining the interrelationships among the four measures, particular attention is given to describing the extent to which construct validity has been established for measures of each component.

The DEST

Form A consists of four scenarios in which ethical issues are embedded. The scenarios were developed from actual reports obtained from experienced dentists concerning common ethical problems encountered in practice. Scenarios present clues to characteristics of the patient that, if not recognized and accommodated, are likely to interfere with patient acceptance of treatment recommendations. These include variations on (a) general health status and oral health status, (b) perceptions of general and oral health status, (c) psychological status of the patient, (d) cognitive competence as a decision maker, (e) knowledge of cause and prevention of dental disease, (f) beliefs about cause of disease and the efficacy of dental health therapies, (g) level of trust in the profession and the professional, and (h) resources (e.g., time and money) to spend on oral health therapy. The dentist's responsibilities in the particular case depend on the characteristics presented, but include (a) treating the patient as the ultimate decision maker and (b) clearly indicating the best treatment. Responsibilities, depending on the situation presented, might also include (c) an unwillingness to compromise patient rights, (d) responsibilities to vulnerable persons, (e) responsibilities to maintaining professional standards, (f) responsibilities to professional colleagues, and (g) responsibilities to the patient's family and larger community.

The scenarios, presenting multiple issues, were audiotaped. Participants listen to a taped conversation between a dentist and a patient and, at a certain point, are asked to take the role of the dentist and interact with the patient as they see fit. Then, participants respond to a series of probe questions designed to elicit their interpretation of the situation. Participants' responses are tape-recorded and transcribed for scoring. Responses are scored by assigning ratings from 1 to 3 to indicate the degree of recognition of each of

34 ethical issues embedded in Form A of the DEST. The issues reflect two dimensions: sensitivity to the characteristic(s) of the drama character (a through h above)¹ and sensitivity to the responsibilities of the professional (a through g above). Judgments are based on the extent to which what is said reflects recognition of particular patient characteristics or professional responsibilities, implied by the scenario, rather than on the quality of the solution offered or the quality of the interpersonal interaction skills displayed – a component 4 competence.

Following is a synopsis of the issues presented in Form A of the DEST. The Judy Radiwich case involves a difference of opinion between an older and younger dentist concerning what treatment should be recommended for a patient. The alternatives vary considerably in terms of cost and have far-reaching consequences for the patient's long-term oral health. The Jim Lohman case involves an 18-year old who has a toothache. He needs much more dental work, but has little money and has difficulty in making a decision. The Margaret Herrington case involves a patient who presents to a new dentist with what appears to be iatrogenic disease caused by substandard work performed by a peer. The Sandy Johnson case involves a young woman with serious dental and oral health problems. She wishes to improve her oral health, but is extremely thin, and resists discussion of nutrition, describing her annoyance with her mother who, she says, is constantly nagging her about eating.

The most recent summary of data on validity and reliability is reported in Bebeau (2006). In terms of reliability, the DEST has an internal consistency ranging from .70 to .78. Test–retest correlation was .90. Evidence of validity included both convergent and discriminant validity. Convergent validity is evidenced by a correlation of .69 with the practitioner's intuitive ranking of protocols. Discriminant validity is evidenced by correlations in the range of .20 to .40, with measures of verbal fluency, technical knowledge, and word count of the subjects' responses. Low-to-moderate correlations between DEST scores and DIT scores (Bebeau, Rest, and Yamoore 1985; Bebeau and Brabeck 1987; Bebeau 2009b) have also been offered as evidence of discriminant validity. In addition, moral sensitivity as measured by the DEST has been shown to improve with instruction (Bebeau and Brabeck 1987), and studies also indicated that students and practitioners vary greatly in their ability to recognize the ethical problems within the profession (Bebeau 1994, 2009b).

The DIT

The DIT (Rest 1979; Thoma 2006) is a paper-and-pencil measure of moral judgment development derived from Kohlberg's theory. The original DIT, used in this study, consists of six moral dilemmas that cannot be fairly resolved by applying existing norms, rules, or laws. Respondents rate and rank arguments (12 for each dilemma) that they consider important in coming to a decision about what they would do. The scores reflect the proportion of times that a person prefers each strategy. For example, the personal interest (PI) Index describes the proportion of times that a person selects arguments that appeal to personal interests or loyalty to friends and family, even when doing so compromises the interests of persons outside one's immediate circle of friends, and the maintaining norms Index describes the proportion of times that a person selects arguments that appeal to the maintenance of law and order, irrespective of whether applying the law to the dilemmas presented results in an injustice. The most widely used score, the

Postconventional (P) Index, describes the proportion of times that a person selects arguments that appeal to moral ideas. In addition to the three main indices, the N2 Index takes into account how well a person discriminates among the various arguments and has been shown to be a better indicator of change than the P Index. If the N2 Index score is higher than the P Index score, it indicates that the respondent is better able to discriminate among arguments than to recognize postconventional arguments. The validity of the DIT has been assessed in terms of seven criteria (Rest et al. 1999): (1) differentiation of various age and education groups; (2) longitudinal gains; (3) correlation with cognitive capacity measures; (4) sensitivity to moral education interventions; (5) correlation with prosocial behaviors and professional decision-making; (6) correlation with political attitudes and choices; and (7) adequate reliability (the Cronbach alpha value is in the upper .70s to low .80s; the test–retest reliability of the DIT is stable). Furthermore, the DIT shows discriminant validity from verbal ability/general intelligence and from conservative–liberal political attitudes – that is, the information in a DIT score predicts the seven validity criteria above and beyond what is accounted for by verbal ability or political attitude. The DIT is equally valid for males and females. No other variable or other construct predicts the pattern of results on the seven validity criteria as well as moral judgment.

The PROI

The PROI (Bebeau, Born, and Ozar 1993) consists of four 10-item rating scales that assess commitment to prioritize professional values over personal values. The first two scales (Authority and Responsibility) assess dimensions of professionalism that are theoretically linked to models of professionalism (i.e., commercial, guild, agent, and service) described in the professional ethics literature. Items on the Authority dimension reflect the view that a profession has ownership over profession-specific knowledge (e.g., once a patient decides to use my service, he/she should follow my advice without questioning my authority). Items on the Responsibility dimension reflect the assumption that the profession has an obligation to provide essential goods and services to the public and also to monitor its members to assure that acceptable standards of health and welfare are maintained (e.g., dentists ought to lobby for oral health care benefits for the disadvantaged). When scores on the Authority and Responsibility dimensions for a particular occupation are plotted within a two-dimensional space, the cluster of scores tends to mirror the relative standing of the occupation within society. Professions high in authority and responsibility tend to be the most prestigious and learned (e.g., law and medicine), whereas those in other quadrants tend to be less respected. Whereas a particular profession may wish for the power and privileges granted to the more learned profession, that status must be granted by society. Whether that status is granted depends on whether the ‘collective of expert service providers have jointly and publicly committed to always give priority to the existential needs and interest of the public they serve above their own and who in turn are trusted by the public to do so’ (Welie 2004, 531). Even though a particular profession may be given that status by society, not all professionals agree on the mix of authority and responsibility associated with their field. For example, some dentists might view the value of their services in more commercial terms, using their powers to persuade a patient to purchase services that may not be in the patient’s best interest (i.e., high on authority and low on responsibility). In the more paternalistic tradition of the

profession (often referred to as the Guild model), dentists used their powers to persuade a patient to purchase services, yet the recommended services attempted to promote the patient's oral health interest – as the dentist understood them (i.e., high on authority and high on responsibility). In contrast to models high on authority, others might view themselves as 'hired guns,' willing to advance their client's or employer's interests irrespective of the interest of others (i.e., low authority and low responsibility). Others might view themselves as providing a significant service to society; even as they sacrifice the quality of care they provide (i.e., high on responsibility and low on authority). Thus, how an individual rates items on the Authority and Responsibility dimensions provides insight into an individual's moral motivation and commitment to the profession's values. Ethicists today (e.g., Ozar) advocate a more interactive model which maintains the authority of the profession while promoting the autonomy and best interests of the patient and the public.

Two other scales (Agency and Autonomy) assess the individual's psychological perceptions of self-efficacy and locus of control. Agency 'refers to the extent to which an individual feels a sense of control and power in his/her life as a practicing professional' (e.g., insurance companies have too much influence over the way I practice dentistry, Bebeau et al. 1993, 29). Autonomy 'refers to the extent to which an individual feels freedom and independence in his/her role' (e.g., I feel free to practice my profession in my own style and according to my own preferences, p. 29). Scores on the Agency and Autonomy scales have provided useful insights for self-assessment and reflection when used in an educational context (Bebeau 2009a). However, to date, these seemingly important dimensions of moral motivation have not been sufficiently elaborated to reliably distinguish known group differences. Thus, data from these two scales are not reported in this study.

Data on the validity of the PROI scales are reported in several studies. Each item is rated on a six-point scale, with scale scores ranging from 10 to 60. The test–retest reliability for the items is .75, with a range of .68 to .82 for the four scales (Born, Bebeau, and Rozmenoski 1995). The most recent estimate of internal consistency for the 40-item PROI completed by 1156 practicing dentists is .77 (Kang 2005). Kang also noted, based on a reanalysis of previous PROI studies, that internal consistencies for the individual scales were consistently higher for dental professional than dental students (e.g., on the Authority scale, .51 for dental professionals compared with .45 for students; on the Responsibility scale, .63 compared with .56; on the Agency scales .74 versus .69; and .52 versus .48 for the Autonomy scale). More importantly, however, the PROI scales – in particular, the Responsibility and Authority scales – have been shown to consistently differentiate beginning and advanced student groups and practitioner groups, who are expected to differ in their role concepts. Moreover, moral motivation, as measured by the PROI, has been shown to improve with instruction (Bebeau 1994, 2009b). In addition, research concluded that the Authority and Responsibility scales appeared to be core dimensions of four models of professionalism (Thoma, Bebeau, and Born 1998). Therefore, in the current study, data analysis was performed on the Authority and Responsibility scales only.

PPS scores

According to Rest (1986), moral implementation and moral action are two separate concepts. Rest included character and ego strength (e.g., weakness of will) as dimensions of moral implementation. The problem, of course, is to operationally define and measure

character. In the professions, Pellegrino and Thomasma (1993) attempted to define the virtues of medical practice. These virtues, or character traits, tend to be reflected in the professional's performance. It is the performance that reflects integrity, honesty, fortitude, temperance, self-effacement, and so on, which is what the PPS measures. Moral action, at least in professional context, reflects consistency over time in interactions with patients and other professionals. Whereas the measure of moral implementation (PPS) includes demonstrations of the virtues of professional practice, it also involves effective problem solving and interpersonal effectiveness. Professional integrity and honesty are only recognizable when displayed in interactions, as articulated by Narvaez (2006). Individuals may have good intentions, but it is the action that we code as effectual or ineffectual. Student and professionals vary in effectiveness of component 4 processes. Thus, we differentiate professional effectiveness in given situations from consistency across situations. Moral action involves consistency. Moral exemplars demonstrate this kind of consistency.

Scores assigned for a course in PPS were selected to serve as a profession-specific proxy measure for moral implementation. Students were required to implement action plans for eight complex cases that present difficult human interaction problems. Each case represented a class of challenging problems that arise in dental practice (e.g., interacting with a colleague whose patient care failed to meet standards; intervening in a case of suspected abuse or neglect). Students plan strategies for handling the case, try out their dialog on a peer, then submit a case write-up that includes (1) an interpretation of the facts to address, in order to resolve the problem effectively; (2) an action plan; and (3) a verbal dialog to illustrate the implementation of the action plan. A checklist, prepared for each case, assured uniformity in judging responses. All responses were scored by the course director. Students could challenge their score and revise their response, based on the written feedback they received. They also could submit a revised response to raise their grade on the exercise. Whereas the relationship between these scores and long-term competence has not been established, these performance-based assessments have face validity, in that they reflect what the individual is able to do in eight complex cases likely to occur in a clinical setting. Scores (ranging from 0 to 32) were tallied for each student at the end of the fourth year of dental school. The total score was derived by assigning 0 to 4 points for each of the eight complex cases the student completed. A score of 32 indicates exceptionally well-implemented action plans for each of the eight complex cases.

Participants

Archival data for 25 cohorts of students, who completed pre- and post-test assessments for a well-validated dental ethics curriculum offered between 1983 and 2008, were available to the researchers. Because for the present study the reliability of DEST scores, originally scored by multiple dentists, was in question, and rescoring DEST responses that varied in length from 8 to 19 single-spaced pages, was time-consuming, a sampling strategy was devised based on a power analysis. Data for 60 females and 60 males were randomly selected from five cohorts (12 females and 12 males from each) who graduated between 1996 and 2000, from a dental school within a large public university, located in the Midwestern region of the United States. Whereas data are available for some 25 cohorts of students, these five cohorts (about 77 students per cohort) were selected for the following reasons. First, there were no major changes to the ethics curriculum during this period,

minimizing the potential impact that could be attributed to instructional differences. Second, Form A of the DEST was used for these five cohorts, minimizing the amount of training required to establish interrater reliability with the rescoring of the DEST protocols. Furthermore, all DEST responses for these five cohorts had been transcribed. In later years, dentists scored directly from taped responses.

Procedures

Participants' DEST scores were originally scored by as many as 32 dentists for each cohort, and as many as 150 different dentists over the years the program has been in operation. Whereas these dentists provided students with personalized feedback which was highly valued by students, the reliability of the original ratings could not be assured. In addition, when a dentist scored a student's DEST response, both the name and gender of the student were known to the dentist, introducing the potential for bias to influence the scoring. For the present study, identifiable information was removed from all responses prior to scoring the current samples.

All DEST protocols were scored by the same rater. Prior to scoring, the first author and a graduate student colleague scored a selected sample of several DEST responses that had been previously used to establish interrater reliability. Each difference in rating was discussed with the DEST developer. After assuring understanding of each scoring criterion in the DEST manual, the two raters scored a second sample of DEST responses independently and again discussed discrepancies with the DEST developer. Next, the two raters selected 16 DEST responses from the current data-set, independently scored them, and checked for interrater reliability (.92, which is the intraclass correlation coefficient for the DEST total score). Then, the first author scored all remaining 104 DEST, periodically checking to insure the intrarater reliability was maintained. As a last step, the first author compared her interrater reliability with the many dentists who did the initial scoring. Overall, the reliability was .52 (ranging from .27 to .87), supporting our judgment to establish the reliability DEST scores prior to data analysis.

Results

Normality of the distribution of each measure

To support a claim that a particular correlation is a meaningful indicator of the strength of the relationship among variables, three conditions must be met. First, each measure must provide a valid and reliable assessment of a particular construct. Second, scores generated by the measure must meaningfully differentiate among those for whom the test is intended. Third, to meet the assumption that a nonzero correlation is a meaningful indicator of the strength of the relationship among variables, the scores must be normally distributed.²

With respect to the first condition, descriptions for each measure (above) address the extent to which construct validity has been established. [Table 1](#) presents descriptive statistics that enable the reader to judge the degree to which the data meet the second and third conditions. For the second condition, [Table 1](#) shows that scores for each measure reflect a range of scores compared with the total possible points, suggesting neither a floor nor ceiling effect for any of the measures.

To meet the third condition, the shape of each distribution was examined (i.e., skewness and kurtosis) to assure that the distributions were neither highly skewed nor flat

Table 1. Descriptive statistics for measures of the four components of morality.

Measure	Point possible	Mean	SD	Range	Skewness	Kurtosis
DEST	102	71.37	5.39	55–88	–.20	.88
PostDIT N2	95	54.50	11.73	12.87–79.67	–.55	.59
PROI						
PostAuthority	60	40.39	4.41	28–49	–.26	–.14
PostResponsibility	60	45.59	5.31	31–58	–.26	.11
PPS	32	22.93	5.24	9–32	–.45	–.24

or peaked. As shown in Table 1, minor deviations from normality were observed for the DEST, which was somewhat peaked (kurtosis = .88), but only slightly negatively skewed (–.20). Scores for the DIT N2, PROI Authority, Responsibility, and PPS indices were normally distributed. Taken together, these findings suggest that the DEST, the post-test DIT N2 score, the PROI post-test Authority and post-test Responsibility scores, and the PPS scores are reasonably normally distributed, suggesting that correlations among the variables would meaningfully reflect the strength of the relationships.

Relationships among total scores for each measure

Simple correlations were calculated among the professional students' DEST total score, post-test DIT N2 score, post-test PROI Authority score, post-test Responsibility score, and PPS score (Table 2). Consistent with the hypothesis, the correlations among different measures of the four components are low (ranging from –.08 to .34). The highest correlation observed was .34, between a measure of moral judgment (post DIT N2 score) and a measure of moral motivation (post PROI Responsibility score).

Correlations between students' DEST subtotal scores and other components of morality

Because each of the DEST cases requires interpretation of different moral issues (see Table 3), we examined the relationship between story scores and the measures of the other components. As shown in Table 3, consistent with the result of the previous question, the correlations at the case level were low to moderate (ranging from –.08 to .34). The highest correlation observed (.34) was between the Johnson case (representing patient competence as a decision maker) and measure of moral implementation (PPS score).

Table 2. Correlations among measures of the four components of morality.

Measures	1	2	3	4	5
1. DEST	–				
2. PostDIT N2	.26**	–			
3. PostPROI Authority	.03	–.01	–		
4. PostPROI Responsibility	.11	.34**	–.08	–	
5. PPS	.16	.03	.09	.03	–

Notes: $N = 120$; ** $p < .01$.

Table 3. Correlations between students' DEST subtotal scores and other components of morality.

Case Issue	Radiwich Patient vs. professional autonomy	Lohman Patient compliance	Herrington Professional malpractice	Johnson Patient competence
1. PostDIT N2	.26**	.12	.18*	.02
2. PostPROI Authority	-.02	-.08	.01	.15
3. PostPROI Responsibility	.09	.07	.03	.08
4. PPS	.05	-.01	-.001	.34**

Notes: $N = 120$; ** $p < .01$; * $p < .05$.

Discussion

This study analyzed relationships among measures of ethical development thought to be measures of the four independent constructs that comprise Rest's (1982) FCM. Consistent with previous studies reporting low correlations between measures of ethical sensitivity and moral reasoning (Bebeau, Rest, and Yamoor 1985; Ernest 1990; Fedeles 2004; Fleck-Henderson 1995; Flower 1992; Lindsey 1986; McNeel and Frederickson 1999; Volker 1984), this study replicated the low correlation between moral reasoning (DIT scores) and ethical sensitivity (DEST scores) for 120 dental students selected from five cohorts who participated in an ethics curriculum. More importantly, the study extends the finding of low correlations between moral sensitivity and moral judgment to low correlations between moral judgment and measures of the other components of morality, namely measures of professional motivation and commitment (PROI scores) and a measure of moral implementation (PPS scores).

Consistent with Rest's hypothesis, the correlations among professional students' performance on measures of moral sensitivity, reasoning, motivation, and implementation ranged from low to moderate ($-.08$ to $.34$). The correlation coefficients provided evidence that measures of the four components have a nonzero correlation. To argue that the measures are distinct from one another, the correlation among them should not exceed moderate. Thus, our results offer substantive support for Rest's (1982) notion that the psychological processes are distinct from one another and that competence on one of the processes does not necessarily predict competence on another component. In addition to the low correlations among the measures, we observed that only 8% of the 120 respondents scored in the upper quartile on all four of the measures, and only 3% of the 120 respondents scored in the lower quartile on all four measures. Indeed, 89% of the students had profiles demonstrating a mix of strengths and weaknesses. Thus, as Rest hypothesized, moral failing could result from a deficiency in one or more of the processes, and the processes would not necessarily develop in tandem.

Both strengths and limitations of the study must be acknowledged. A major strength of this study is the quality of data available for analysis. In contrast to many studies that use data collected from volunteers, this study used archival data from a long-term professional ethics curriculum in which measures of the four components had been designed, validated, and consistently administered either as pre- and post-test assessments (the measures of moral judgment [DIT scores] and moral motivation [PROI scores]; pre-DIT was administered at the beginning of the first year; post-DIT was administered at the end of the fourth year; pre-PROI was administered at the beginning of the first year; post-PROI was

administered at the end of the fourth year) or as outcome measures administered later in the professional program (the measures of ethical sensitivity [DEST scores] was administered at the end of the third year and ethical implementation [PPS scores] was administered at the end of the third and fourth years). The curriculum was required, rigorous, challenging, and valued by students. Performance on each measure represented student effort, as performance was self-assessed, assessed by experienced and respected professionals, and included in individual course portfolios that were available to students for review throughout the four-year program. Although grades were not assigned on the basis of scores on the outcome measures, the outcome measures reflected the degree to which students had achieved the broader curriculum objectives, whereas course grades were assigned based on completion of course assignments. Because the curriculum had been in place for more than two decades, it was possible to randomly select a sample of students from each of five successive cohorts who completed the program during a time when the curriculum was not undergoing change.

A second strength is the extent to which the measures meaningfully discriminate among students. Not only are the measures sensitive to the educational intervention (You and Bebeau 2012), but the measures assess distinct capacities. In other words, scores on one measure do not predict scores on another. Commenting on the difficulty educators in the professions have experienced in predicting later job performance from measures given prior to or even during professional education, Siu and Reiter (2009) point out that meaningfully differentiating among students is more challenging in professional education, as students' scores represent a highly range-restricted group on many academic measures. Skewed distributions with restricted range and/or ceiling effects – troublesome qualities for many measures used with professional education groups – were not characteristics of the measures used in this study. Thus, it appears the measures have potential for broader use beyond their current use – as diagnostic tools for professionals who have been disciplined by a licensing board (Bebeau 2009a, 2009b). They may be used to predict professional competence, as well as to give students meaningful feedback that would enable them to set goals for their personal development.

One limitation of the study is the absence of a behavioral indicator. Whereas the end point of performance on each of the four components of morality is consistency in real-life moral behavior, this study did not have a behavioral indicator that could be used to differentiate levels of goodness. Indeed, some studies in professional education (see Bebeau 2002 for a review) have used ratings of clinical performance to differentiate levels of excellence among physicians, nurses, and dentists. Such a measure relies on expert judgment by mentors which could not be reconstructed for this retrospective study. It should be noted, however, that all students from these five cohorts graduated and all passed their clinical board examinations.

Predicting to real-life behavior is considered the gold standard in studies of morality. Yet, as Rest and Narvaez (1994) point out in the preface to *Moral Development in the Professions: Psychology and Applied Ethics*, the challenges of morality are diverse and multifaceted. One set of concerns has to do with crime and destructive behavior. Issues in fundamental socialization and basic primitive elements of morality, emphasized by psychologists like Bandura and moral educators like Lickona, are quite different from the concerns for moral development in the professions. Note that issues of cheating and unprofessional conduct do not arise in the professions, they do, but they are relatively uncommon, and when they do, there typically is a major uproar over such instances

[*Las Vegas Review Journal, Editorial* 2006; Rudavsky, S. 2007. “Cheating Scandal Snares Nearly Half of IU Dental Class.” (*The Indianapolis Star*, May 8); Sherman, T., and J. Margolin 2007. “New Cheating Scheme Rocks Dental School. UMDNJ Plans to Discipline Eight Linked to Exam-Copying Scandal.” (*Newark Star Ledger*, February 16)]. Generally, people in the professions – by virtue of having made it through years of schooling and supervised work – have at least average impulse control, self-discipline, and self-regulation abilities, ego strength, and social skills. Thus, arriving at a measure of behavior to use to study the relative contributions of each of the components of morality is not easy. For example, reflecting on approximately 2500 graduates from the 25 cohorts who have completed the ethics curriculum over the past 25 years, only a handful have been disciplined by the licensing board. Similarly, of the 235 physicians from 24 cohorts identified by Papadakis et al. (2005) who were disciplined by a medical board, only a small percentage violated moral behavioral standards in a way that was publicly identifiable. As Papadakis et al. (2005) and Bebeau (2009a, 2009b) have demonstrated, working backward from disciplinary actions, it is possible to identify shortcomings in behavior (Papadakis and colleagues noted behaviors in medical school that predicted later disciplinary action) or in components of morality (Bebeau noted shortcomings in moral motivation and/or in sensitivity, reasoning, or implementation) that have explanatory power, but it is quite another matter to argue that a deficiency in a capacity predicts immoral or unprofessional behavior.

A second limitation of the study must be acknowledged. Because of the amount of effort required to rescore all the DEST responses (a minimum of 1 hour of time is required to score one student response) before the study could be conducted, the statistical models available for analysis were limited. For example, simple correlations were used to examine the interrelationship among the four components. With regard to future studies, it may be possible to conduct a study by using the DEST responses scored by the dentists who demonstrated good interrater reliability with calibrated raters. This would enable the researcher to select more cases from the archived data-set and utilize a more sophisticated statistical method to examine the interrelationship among the four components. In addition, a follow-up study of participants who have been engaged in the real-world practice of dentistry could not only establish the predictive validity of performance on measures of the components and some (to be determined) measures of clinical competence, but also show the links to behaviors. A longitudinal comparison of participants’ scores on various instruments when they were students, as compared with performance after some years in practice, would also inform our understanding of the validity of the measures designed to assess the outcomes of the dental ethics curriculum, as well as their ability to predict real-life professional practice.

The implications for moral and character education are substantial. Rest argued that the capacities that give rise to morality are distinct from one another. Thus, facilitating competence in moral reasoning, as many programs are designed to do, could not be expected to carry over to other capacities – such as sensitivity, moral motivation and commitment, and moral implementation. Findings from this study support the independence of the four capacities and add weight to the design principles behind the dental ethics curriculum (Bebeau 1994, 2009a, 2009b), and Narvaez’s (2006) program for children. Both Bebeau and Narvaez crafted their respective moral or character education programs to address the four capacities as separate abilities.

Conclusion

Rest (1982) argued that at least four independent psychological processes are involved in the regulation and production of moral behavior. Simple correlations were calculated among professional students' scores on measures of the Four Components of Morality (Rest 1982): moral sensitivity, judgment and reasoning, motivation, and implementation. Based on the analysis, the interrelationship among professional students' scores on the different measures ranged from low to moderate. In other words, competence in moral sensitivity does not predict competence in moral reasoning, or moral motivation, or moral implementation. Whereas replication of this study in the current setting and in other settings would help to confirm our findings, educators concerned with devising curriculum to promote ethical development should be aware that unethical behavior can result from deficiency in any one of the components, and competency in one component does not necessarily guarantee competency in any other components. Thus, as with the dental ethics curriculum (Bebeau 1994, 2009a, 2009b), and with Narvaez's (2006) program for children, carefully crafted moral or character education programs should consider addressing each of Rest's components of morality as independent abilities.

Notes

1. See Bebeau (1996) for a detailed account of the multiple ways these characteristics interact with each other to provide challenges to practitioner decision-making. The dentist's task is to interpret these patient characteristics and describe how they apply to his/her responsibilities as a professional.
2. Whereas this condition may not be difficult to meet in many educational settings, Siu and Reiter (2009) point out that meaningfully discriminating among students is more challenging in professional education settings as skewed distributions with restricted range tend to characterize data from many of the measures educators would like to use to assess professionals.

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