

1-1-2003

Development and validation of a professional behavior assessment.

Kristie Koenig
Temple University

Caryn Johnson
Thomas Jefferson University, caryn.johnson@jefferson.edu

Cathleen K Morano
Temple University

Joseph P Ducette
Temple University

[Let us know how access to this document benefits you](#)

Follow this and additional works at: <http://jdc.jefferson.edu/otfp>

 Part of the [Occupational Therapy Commons](#)

Recommended Citation

Koenig, Kristie; Johnson, Caryn; Morano, Cathleen K; and Ducette, Joseph P, "Development and validation of a professional behavior assessment." (2003). *Department of Occupational Therapy Faculty Papers*. Paper 12.
<http://jdc.jefferson.edu/otfp/12>

This Article is brought to you for free and open access by the Jefferson Digital Commons. The Jefferson Digital Commons is a service of Thomas Jefferson University's [Center for Teaching and Learning \(CTL\)](#). The Commons is a showcase for Jefferson books and journals, peer-reviewed scholarly publications, unique historical collections from the University archives, and teaching tools. The Jefferson Digital Commons allows researchers and interested readers anywhere in the world to learn about and keep up to date with Jefferson scholarship. This article has been accepted for inclusion in Department of Occupational Therapy Faculty Papers by an authorized administrator of the Jefferson Digital Commons. For more information, please contact: JeffersonDigitalCommons@jefferson.edu.

▲ Development and Validation of a Professional Behavior Assessment

Kristie Koenig, PhD, OTR/L
Caryn Johnson, MS, OTR/L, FAOTA
Cathleen K. Morano, PhD
Joseph P. Ducette, PhD

Allied health students must quickly socialize into a professional role as they transition from classroom to clinic. In addition to skill development, students must exhibit a host of professional behaviors that facilitate successful interaction with patients, families, and colleagues. There is a need for a valid, reliable assessment of professional behaviors that contribute to clinical competence. This study reports on the development and validation of a professional behavior assessment for occupational therapy students on a part-time clinical rotation (Level I). The Philadelphia Region Fieldwork Consortium (PRFC) Level I Student Evaluation was developed from an initial survey ($n = 75$) to generate an item pool, followed by a content review by a panel of experts ($n = 5$) to establish relevancy, clarity and content validity. This 12-item instrument was administered to 317 occupational therapy and occupational therapy assistant students. A principal component factor analysis and item analysis was conducted. Internal consistency reliability (Cronbach's alpha) was 0.89, with intra-rater reliability for the 12 items ranging from 0.68 for "written communication" to 0.89 for "observation skills." The PRFC Level I Evaluation demonstrates discriminant validity, with students on their first clinical rotation scoring significantly ($p < 0.001$) lower than students on their third or fourth rotations, indicating a developmental process of professional socialization. *J Allied Health*. 2003; 32:86-91.

APPRENTICESHIP IS AN INTEGRAL component in many professional programs and disciplines. It often takes the form of clinical internships, student teaching assignments, or cooperative learning experiences with people "in the

Dr. Koenig is assistant professor, Department of Occupational Therapy, College of Allied Health Professions, Temple University; **Ms. Johnson** is academic fieldwork coordinator, College of Health Professions, Thomas Jefferson University; and **Dr. Morano** is professor and **Dr. Ducette** is acting dean at the College of Education, Temple University, Philadelphia, Pennsylvania.

Received December 13, 2001; revision received May 24, 2002; accepted July 15, 2002.

Address correspondence and reprint requests to: Kristie Koenig, PhD, OTR/L, Department of Occupational Therapy, College of Allied Health Professions, Temple University, 3307 North Broad Street, Philadelphia, PA 19140; telephone: (215) 707-4883; fax: (215) 707-7656; e-mail: <kkoenig@temple.edu>.

field." The skills that a student needs to succeed in these types of experiences include behaviors that develop through the professional socialization process.

Dramatic shifts in health care have had a significant impact on clinical education. Previously, more extensive resources were available for student training, the patient's average length of stay was longer, staff downsizing and turnover were less prevalent, and student skill development was the primary focus of clinical education. Although skill development continues to be important as students make the transition from the classroom to the practice environment, students now must be ready at the outset to exhibit a host of professional behaviors that facilitate the acquisition of skills that enable them to interact successfully with clients, caregivers, and other health care professionals. These behaviors indicate the student's initiative, time management skills, ability to direct his or her learning, and interpersonal and organizational skills and may be viewed as a barometer of the student's ability to function in an ever-changing practice arena.

Needed is a way to assess students' professional behaviors, to ensure their readiness before they interact with clients in the field. The purpose of this study was to develop and validate an instrument that measures the professional behaviors of occupational therapy (OT) and occupational therapy assistant (OTA) students on level I fieldwork. When internal validity was established, the second phase of the research examined the external validity of the instrument and determined if the instrument could discriminate adequately between known groups. As students are socialized into a profession, do they achieve progressively higher professional behavior scores in successive semesters?

Theoretical work on professional socialization in the health professions originated in the 1960s, when social psychologists studied adult socialization in the context of medical education.^{1,2} In separate studies, Lurie³ and Glenn⁴ examined the sources and determinants of professional socialization. According to Glenn,⁴ "Early stages of professional socialization are important . . . in that attitudes, values and beliefs tend to stabilize in young adulthood, with the early period of a career for developing commitment to work, stimulating motivation, and internalizing occupationally relevant attitudes and behaviors that sustain productivity and continued achievement."

Bruhn⁵ discussed the need for allied health education to focus on giving students the basic skills they need for professional socialization. These include critical thinking, communication skills, personal management skills, writing skills, interpersonal skills, and team leadership, and taking an increased responsibility for learning and goal setting.⁵ The development and assessment of professional behaviors as a key aspect of professional socialization is a focus in allied health programs.⁶⁻⁸ This socialization process begins when a student enters the professional program and intensifies as the student begins to make the transition from the classroom to the practice setting. The formative feedback and evaluation processes are integral components that can be used to assist students to become more aware of their own professional development.⁹

Curricula in schools of higher education often have part-time preceptorships or clerkships that lead to a more full-time experience for the student when the academic requirements of the program have been met. These experiences often are designed to give the student and instructor critical feedback on student performance and to identify deficit areas that might be a concern later on. In addition, they help the clinical education site "frame" the student learning experience by identifying essential skills for success in the current practice context.

Thompkins and Harkins¹⁵ stressed the importance of performance during clinical rotations as a predictor for later success in a licensing examination for respiratory therapists. A subjective rating scale was used in the study, however, that the authors cautioned was a weakness in the prediction model. Hubbard¹⁴ identified the need for the development of a formative evaluation that takes into consideration the production demands on health care providers, has interrater reliability, and is user friendly and practical. A review of existing instruments designed to measure OT student performance in level I clinical education found them to be incomplete in content; to have limited, if any, reliability and validity evidence; and to be impractical for current clinical practice.^{7,16,17}

Student failure in the clinical education component of the curriculum often has its origin in professional behavior issues. Until now, however, these behaviors have not been operationalized and were not measured directly. In a study by Gutman et al.¹¹ professional behavior and interpersonal skill problems were addressed while students who showed problematic behaviors were completing course work before fieldwork. The results indicated a decrease in the level II fieldwork failure rate after implementation of the intervention when compared with the previous 10 years. For programs desiring to facilitate the development of professional behaviors, a valid formative evaluation could be useful in promoting student assessment and self-assessment.¹⁴

Professionalism has been addressed in the literature of many disciplines. The qualities of professional behavior each discipline emphasizes are based on the values that that professional group subscribes to and are consistent with the

professional socialization process. Although *professionalism* refers to the enactment of a profession as it pertains to scholarly activities and standards of performance, conduct, and achievement,¹⁸ *professional behavior*, for purposes of this study, refers to skills associated with interpersonal communication, initiative, organization, and clinical reasoning that students must master to be successful on clinical rotations.

This article outlines the development and validation of a professional behavior assessment designed to meet the clinical educators' need for an efficient assessment that provides formative and summative feedback to students, clinical sites, and educational programs regarding the essential skills needed for a student's ongoing professional development and socialization.

Method

SAMPLE

The *Philadelphia Region Fieldwork Consortium (PRFC) Level I Fieldwork Student Evaluation* was completed on 317 students from four OT and one OT assistant program participating in level I fieldwork. The assessments were identical for OT and OT assistant students and were completed by on-site clinical educators at the end of each fieldwork experience.

INSTRUMENT DEVELOPMENT

To operationalize the construct of professional behavior, a convenience sample of clinicians ($n = 75$) was surveyed. The survey sample comprised clinicians who currently are involved in student training, representing novice to expert clinical educators, who were attending a workshop on professional behavior issues. The sample represented clinical educators from a variety of practice settings that supervise level I and level II OT students. Clinicians were asked to identify and operationalize professional behavior, indicating behaviors that they believed were indicative of or showed a lack of professional behavior. Each clinician identified 10 specific behaviors they believed contributed to successful clinical performance. This survey generated an initial item pool reflective of issues related to professional behavior of students.

Based on the results of this survey, descriptive data on behaviors identified as *professional behaviors* were analyzed, resulting in a 10-item scale that reflected the most prevalent behaviors that clinical educators identified when surveyed. Each item had a 5-point response scale ranging from 1 to 5: 1 = well below standards; 2 = below standards; 3 = meets standards; 4 = exceeds standards; and 5 = far exceeds standards. For each of these ratings, descriptors of level of performance were given to provide additional guidelines for scoring.

A panel of experts ($n = 5$), consisting of clinical and academic fieldwork educators with at least 10 years of experience and recognized by the clinical and academic OT communities for their expertise in fieldwork education and professional behavior issues, reviewed the initial item pool

TABLE 1. Definitions of Professional Behavior Items

Items	Descriptors
Time management	Ability to be prompt, and to complete assignments on time
Organization	Ability to set priorities, be dependable, be organized, and follow through with responsibilities
Engagement in the fieldwork experience	Apparent level of interest, level of active participation while at the clinical education site, personal investment in clients and treatment outcomes
Self-directed learning	Ability to take responsibility for own learning, demonstration of motivation
Reasoning and problem solving	Ability to use self-reflection, willingness to ask questions; ability to analyze, synthesize, and interpret information; demonstration of understanding of the therapy process
Written communication	Use of correct grammar and spelling, legibility, successful completion of written assignments, documentation skills
Initiative	Ability to demonstrate initiative and flexibility, ability to seek and acquire information from a variety of sources
Observation skills	Ability to observe behaviors for relevant information and to verbalize perceptions and observations
Participation in the supervisory process	Ability to give, receive, and respond to feedback; seek guidance when necessary; follow proper channels
Verbal communication and interpersonal skills	Ability to interact appropriately with individuals (i.e., eye contact, empathy, limit setting, respectfulness, use of authority), degree/quality of verbal interactions, use of body language and nonverbal communication
Professional and personal boundaries	Ability to recognize and handle personal and professional obligations; handle responsibilities; work with others cooperatively, considerately, and effectively; responsiveness to social cues
Use of professional terminology	Ability to respect confidentiality, appropriately apply professional terminology (e.g., acronyms, abbreviations) in written and oral communication

for content validity. A follow-up focus group ($n = 5$) was assembled to comment on the (1) relevancy of each item to the construct of level I performance, (2) completeness of the initial item pool, and (3) clarity and conciseness of each item. Each member of this focus group was a clinical educator with at least 5 years of experience in direct Level I fieldwork student supervision. Input from the panel of experts and focus group resulted in expansion of the instrument to 12 items as depicted in Table 1, which objectively defines the qualities of professional behavior believed to be integral to successful performance as an OT or OTA student on level I fieldwork.

PROCEDURE

Clinicians were introduced to the *PRFC Level I Fieldwork Student Evaluation* at a local professional meeting. In addition, a letter was sent at the beginning of the semester to all clinical educators that explained the development and use of the new instrument and included directions for rating the students. Clinical educators completed the assessment at the end of the student's level I fieldwork experience and discussed results with the student. Both parties signed the instrument, then sent it back to the appropriate participating school.

PHASE 1: ITEM ANALYSIS AND FACTOR ANALYSIS

In order to empirically evaluate the validity of the instrument, a series of analyses were completed as outlined by DeVillis.¹⁹ Internal consistency reliability was calculated for the full scale and an exploratory factor analysis was per-

formed to assess the structure of the instrument. Additional item analyses included a view of each item's variance to assess scoring range diversity and item mean analysis to assess a potential bias in extreme responses. An internal consistency reliability coefficient was calculated. Although a value of 0.70 to 0.80 is deemed an acceptable level for research instruments that analyze group data,¹⁹ the α for this study should be higher (0.90) because this instrument will be used for individual assessment of a high-stakes nature (i.e., determining a student's pass/fail status for level I fieldwork).

Results

Internal consistency reliability was calculated for the total instrument with Cronbach's α . α for the *PRFC Level I Fieldwork Student Evaluation* ($n = 317$) was 0.89, which reflects a high degree of internal consistency. A principal component factor analysis fit a latent one-factor model. Items with factor loading greater than 0.30²⁰ were retained on one factor with 62% of the variance explained by that factor with an eigenvalue of 7.48. This factor analysis showed that "score variability attributable to one major dimension was much greater than the score variability attributable to any other identified dimension."²¹ One factor labeled *professional behavior* emerged from this analysis.

Item analyses were conducted, and the mean, SD, and minimal/maximal scores were obtained (Table 2). The SDs and ranges for each of the 12 items showed acceptable and consistent variability.

As indicated in Table 2, there were neither ceiling effects nor floor effects. Items ranged from a high mean of

TABLE 2. Items in the PRFC Level I Fieldwork Student Evaluation

Item Number	Mean	SD	Minimal	Maximal	Item
1	3.84	0.79	1	5	Time management
2	3.89	0.72	2	5	Organization
3	4.18	0.73	2	5	Engagement in fieldwork experience
4	4.04	0.73	3	5	Self-directed learning
5	3.90	0.70	2	5	Reasoning/problem solving
6	3.67	0.75	2	5	Written communication
7	3.82	0.76	2	5	Initiative
8	3.82	0.71	3	5	Observation skills
9	3.89	0.76	2	5	Participation in supervisory process
10	4.02	0.79	1	5	Communication (patients/staff/clients)
11	3.94	0.77	3	5	Professional/personal boundaries
12	3.61	0.74	1	5	Use of professional terminology
Total score	46.41	7.37			

Possible range of scores: 1–5.

4.18 for *engagement in fieldwork* to a low of 3.67 for *written communication*.

PHASE 2: INTRARATER RELIABILITY

The purpose of phase 2 was to determine the intrarater reliability of the instrument. A random sample ($n = 37$) of clinical educators was asked to complete a second evaluation of the same student approximately 2 to 3 weeks later. Clinicians were asked to rescore student performance without reviewing the documentation they had collected on the student. As indicated earlier, the original instrument had been returned to all participating schools. The correlation analysis of the initial scores and the follow-up scores are presented in Table 3.

The item score reliability coefficients ranged from a low of 0.68 (*written communication*) to a high of 0.89 (*observation skills*); the total score reliability coefficient was 0.88. These results indicate adequate reliability of raters over time.

PHASE 3: VALIDITY: COMPARISON OF KNOWN GROUPS

The purpose of this phase was to gather evidence for the discriminant validity of the instrument using *known groups*, that is, groups expected to differ with respect to their performance on level I fieldwork. The specific groups in this data set that are developmentally based include the sequence of rotation, student age, and degree program. The means and SDs for these groups are presented in Table 4. Weighted analyses of variances were used to control for differences in group size in sequence, student age, degree programs, and gender.

With respect to sequence, the first and second rotations typically occur during the first year of professional education, whereas the third and fourth rotations occur in the second and final year of the professional program. Because of the hypothesized developmental nature of professional

behavior and socialization, the researchers expected improvements in performance between first-year and second-year students, differences as a function of degree program (masters > bachelors > associates) and differences in age groups (older > younger) as a function of an increased knowledge base and ongoing feedback regarding professional development.

RESULTS OF COMPARISON OF KNOWN GROUPS

A one-way (sequence: first, second, third, fourth) analysis of variance revealed a significant effect for sequence, $F_{(3,313)} = 10.56, p < 0.001$. Duncan post hoc testing was completed; as expected, students on their third ($M = 49.42$) and fourth ($M = 47.98$) level I fieldwork experiences scored higher on the total score compared with students on their first level I fieldwork ($M = 44.69$).

A one-way (age group: <23, 23–29, >29) analysis of variance revealed a significant effect for age group, $F_{(2,307)} = 3.78, p < 0.05$. Duncan post hoc testing indicated that students in the >29 age group ($M = 48.37$) had a significantly

TABLE 3. Analysis of Intrarater Correlations ($n = 37$)

Item	r_{xx}
Time management	0.84
Organization	0.86
Engagement in fieldwork	0.75
Self-directed learning	0.82
Reasoning/problem solving	0.88
Written communication	0.68
Initiative	0.74
Observation skills	0.89
Participation in supervisory process	0.80
Communication (e.g., patients, clients)	0.83
Professional/personal boundaries	0.72
Use of professional terminology	0.78
Total score	0.88

TABLE 4. Means and SD for Different Groups

Variable	N	Mean	SD
Sequence			
First rotation	135 (42.6%)	44.69	6.74
Second rotation	52 (16.4%)	46.17	6.41
Third rotation	85 (26.8%)	49.42	6.90
Fourth rotation	45 (14.2%)	47.98	7.51
Age grouping			
Under 23	111 (35.8%)	45.18	6.69
23–29	145 (46.7%)	46.88	6.50
>29	54 (17.4%)	48.37	6.16
Degree program			
Associates	40 (12.7%)	44.51	7.13
Bachelors	106 (33.5%)	47.60	7.14
Masters	170 (53.8%)	46.65	6.98
Gender			
Male	32 (10.1%)	46.84	7.04
Female	285 (89.9%)	46.67	7.12

higher total score than students in the <23 group ($M = 45.18$). Interpersonal skills, $F_{(2,307)} = 4.79, p < 0.01$ and initiative, $F_{(2,307)} = 5.20, p < 0.01$ showed a significant effect for age group. Students in the >29 age group ($M = 16.81$) scored significantly higher on interpersonal skills than students in the <23 group ($M = 15.49$). Students in the >29 age group ($M = 8.33$) scored significantly higher on initiative than students in the 23–29 group ($M = 7.88$) and <23 group ($M = 7.61$). Items that tapped into the developing professional knowledge base (use of professional terminology, clinical reasoning/problem-solving, and observation skills) did not display any significant differences on the analysis. Overall, student performance was not a factor of age with the exception of initiative and interpersonal skills.

A one-way (degree program: associate, bachelor, master) analysis of variance indicated a significant effect for degree, $F_{(2,313)} = 3.89, p < 0.05$. Duncan post hoc testing indicated that bachelor ($M = 47.60$) and master ($M = 46.65$) level students scored significantly higher than students in an associate degree ($M = 44.51$) program for OT assistants. There were no significant differences in Level I performance between men and women.

Discussion

The purpose of this research was to develop and evaluate the psychometric properties of an instrument designed to measure professional behavior in OT and OTA students during level I fieldwork. A factor analysis suggested that a single factor accounts for a significant amount of the variance. Reliability analyses indicated that the *PRFC Level I Fieldwork Student Evaluation* is internally consistent and stable over time.

The *PRFC Level I Fieldwork Student Evaluation* provides a reliable assessment of student performance specifically as it relates to the development of professional behavior and

should be viewed as one of many indicators of the development of professional behavior. As expected, analyses of known groups indicated that students in the third and fourth year of professional education scored higher in measures of professional behavior and clinical reasoning than students in the first year of professional education. These expected differences support the concept of professional socialization as a developmental process that progresses as students learn the art and science of becoming a therapist. In addition, students who scored low on the *PRFC Level I Fieldwork Student Evaluation* in the first year of professional education have the opportunity to receive critical formative feedback regarding their professional development. Students who accept and respond to valid, formative feedback can move toward socialization into the profession with its values, expectations, and occupational norms.

As hypothesized, analysis of known groups indicated that bachelor and master level students scored higher than students in an associate degree program. The OT assistant is not expected to engage in the same level of reasoning, problem solving, and in-depth analysis as the OT. In accordance with state licensure laws and national association guidelines, the OT assistant assists the OT in the evaluation and treatment process and must be supervised by an OT.

An additional finding, although not counterintuitive to the hypothesized developmental process, was that students in a “nontraditional” age demographic (>29 years) scored higher than their younger cohort on interpersonal skills and initiative, which resulted in higher total scores for this age demographic. One explanation is that these students are simply more mature, with stronger interpersonal skills, and are comfortable taking initiative, similar to the initiative involved in returning to school after a longer hiatus or job change. There were no significant differences between age groups on items that tapped into knowledge gained from coursework during the academic portion of professional education.

Overall the results suggest that the *PRFC Level I Fieldwork Student Evaluation* is a psychometrically strong instrument that can discriminate among students as they develop professionally and can identify students who may need more direct intervention to become professionally socialized. The development and psychometric evaluation of a reliable and valid measure, based on clinician input to define best student practice out in the field, meets the need of academic and clinical educators to have a uniform, efficient assessment that can provide the student with formative and summative feedback. These findings are based on a regional sample in the urban Philadelphia area. Further research should gather data from a national sample and additional OT assistant programs. Research on the predictive validity of the *PRFC Level I Fieldwork Student Evaluation* currently is being investigated in a longitudinal study that tracks students throughout the professional program, through their full-time internships, and as they sit for the national certification examination.

Applications

The ability to evaluate professional behavior in students is important because mastery of these behaviors is prerequisite to successful performance in clinical education. Using a valid and reliable instrument to provide formative evaluation of professional behaviors can heighten student awareness of strengths and weaknesses and allow students to implement strategies to address targeted areas. Use of a valid and reliable tool for summative purposes enables clinical educators to assess objectively the quality of student performance in part-time clinical education and may predict student success in full-time clinical education. Allied health education programs may have an interest in assessing the professional behavior of their students before the final phases of clinical education to identify and intervene with at-risk students and increase their chances of successful performance in clinical education.

We acknowledge the members of Philadelphia Region Fieldwork Consortium, with whom we collaborated on the development and research of this tool over the past 3 years: Wendy Wachter-Schutz, Catherine Verrier Pierisol, and Susan Santalucia.

REFERENCES

1. Levinson DJ. Medical education and the theory of adult socialization. *J Health Soc Behav.* 1967; 8:253-265.
2. Omstead A, Paget MA. Some theoretical issues in professional socialization. *J Med Educ.* 1969; 44:663-669.
3. Lurie EE. Nurse practitioners: issues in professional socialization. *J Health Soc Behav.* 1981; 22:31-48.
4. Glenn ND. Values, attitudes, and beliefs. In: *Constancy and Chance in Human Development.* Cambridge: Harvard University Press; 1980.
5. Bruhn JG. The changing limits of professionalism in allied health. *J Allied Health.* 1987; 16:111-118.
6. American Occupational Therapy Association. *Manpower Survey for the Profession of Occupational Therapy.* Bethesda, MD: AOTA, 1998.
7. Kasar J, Clark N. *Developing Professional Behaviors.* Thorofare, NJ: Slack, 2000.
8. Weis D, Schank M, Eddy D, Elfrink V. Professional values in baccalaureate nursing education. *J Prof Nurs.* 1993; 9:336-342.
9. Hageman PA. Ratings of clinical clerkship feedback by allied health faculty and students. *J Allied Health.* 1988; 17:115-119.
10. Murden R, Galloway GM, Reid JC, Colwill JM. Academic and personal predictors of clinical success in medical school. *J Med Educ.* 1978; 53:711-719.
11. Gutman SA, McCreedy P, Heisler P. Student Level II fieldwork failure: strategies for intervention. *Am J Occup Ther.* 1998; 52:143-149.
12. Tickle-Degnen L. Working well with others: the prediction of students' clinical performance. *Am J Occup Ther.* 1998; 52:133-142.
13. Feldman E, Crook J. Personal characteristics of health professionals: can they be changed by an educational program? *J Allied Health.* 1984; 13:163-168.
14. Hubbard S. Training fieldwork supervisors. *OT Practice.* 1998; 3:39-40.
15. Thompkins LS, Harkins CJ. Predicting academic success in a non-traditional allied health program. *J Allied Health.* 1990; 19:15-24.
16. Brown S, Caruso Streeter LA, Stoffel VC, McPherson JJ. Development of level I fieldwork evaluation. *Am J Occup Ther.* 1989; 43:677-682.
17. Paladino J, Jeffries RN. *The Occupational Therapy Fieldwork Manual for Assessing Professional Skills.* Philadelphia: FA Davis, 2000.
18. Miller BF, Keane CB. *Encyclopedia and Dictionary of Medicine, Nursing and Allied Health.* Philadelphia: WB Saunders, 1987.
19. DeVillis RE. *Scale Development: Theory and Applications.* London: Sage Publications, 1991.
20. Child D. *The Essentials of Factor Analysis.* London: Holt, Rinehart, & Winston, 1970.
21. American Educational Research Association. *Standards for Educational and Psychological Testing.* Washington, DC: American Educational Research Association, 1999.
22. Messick S. Validity of psychological assessment. *Am Psychol.* 1995; 50:741-749.