The Standards for Educational and Psychological Testing: Zugzwang for the Practicing Professional?

Prepared for:

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What the heck is Zugzwang and how can I get me some?

- It is a paradox of chess that the right to move can occasionally become an onerous obligation.
- Chess players know such situations as zugzwangs -- "zugzwang" being the German for "obligation to move."
- Simple zugzwang - one side can suffer from having the move.
- Mutual zugzwang - neither side can move without worsening its position.

Highlights of the Standards for Educational and Psychological Testing

Three organizations were responsible for the development of the 1999 Standards

- **American Educational Research Association (AERA)**
- **National Council on Measurement in Education (NCME)**
- **American Psychological Association (APA)**

Standards - 1985 and 1999 versions

The 1999 Standards

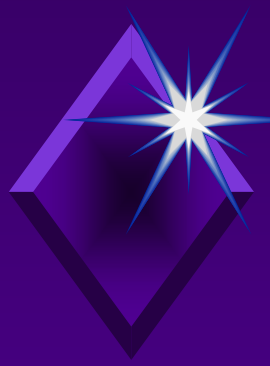
- has more background material, a greater number of standards, and an expanded glossary and index
- reflects changes in federal law and measurement trends affecting validity, etc.
- addresses professional and technical issues of test development and use

The Purpose of the Standards

- **to promote the sound and ethical use of tests**
- **to provide assessment professionals with guidelines for the evaluation, development, and use of testing instruments**
- **to provide a frame of reference for addressing relevant issues**

The Standards are not

- **legislation or law**
- **a ‘checklist’ for evaluating the acceptability of a test or its use**



Overview - Organization and Content Part One

Test Construction, Evaluation, & Documentation

- Validity
- Reliability and Errors of Measurement
- Test Development and Revision
- Scales, Norms, and Score Comparability
- Test Administration, Scoring, and Reporting
- Supporting Documentation for Tests

Overview - Organization and Content Part Two

Fairness in Testing

- Fairness in Testing and Test Use
- The Rights and Responsibilities of Test Takers
- Testing Individuals of Diverse Linguistic Backgrounds
- Testing Individuals with Disabilities

Overview - Organization and Content Part Three

Testing Applications

- The Responsibilities of Test Users
- Psychological Testing and Assessment
- Educational Testing and Assessment
- Testing in Employment and Credentialing
- Testing in Program Evaluation and Public Policy

Chapter 1—Validity

The Grail--testing pointless without it

- **refers to the degree to which evidence and theory support the interpretations of test scores entailed by proposed uses of tests**
- **the most fundamental consideration in developing and evaluating tests**

Lines of Validity Evidence

The Standards move away from language about types of validity to lines of validity evidence.

- **test content**
- **response/scoring processes**
- **internal structure of test**
- **relationships to other variables**

The Standards on Validity Focus

- **on the obligations of the test developer to users, examinees, and other testing practitioners**
- **on user obligations to examinees**

Developers owe users

Enough information to make judgments about the appropriateness of their interpretation of test scores for their intended use(s)

- **population(s) for which test is appropriate**
- **constructs tested**
- **uses/interpretations NOT intended or recommended**

Developers owe users

- content descriptions, domains, criticality
- qualifications of experts/judges/raters
- rating/scoring procedures
- population/situation variables involved in validation

Developers owe users

- quality of criteria
- statistical adjustments made
- relation of local situation to meta-analytic variables used

Developers owe examinees

reasonable assurance that tests will not be used improperly

- **use of content/constructs appropriate to recommended and/or intended use(s)**
- **adequate warning to users against uses NOT recommended or intended**
- **accuracy in criterion validation, when performed**
- **investigation of unintended/unexpected outcomes (e.g., DIF)**

Developers owe other practitioners

sound practices and evidence, accurately and adequately described

- **validation samples in relevant detail**
- **processes/procedures in adequate detail**
- **criteria adequately described**
- **statistical evidence and descriptions of any adjustments**

Users owe examinees

appropriate use(s) of tests

- **following test developers' guidelines on usage of the test**
- **validating new uses of a test**

Obligations under Standards

Developer should help User:

- **use test results properly; ‘head off’ obvious improper uses**
- **understand test’s value, limitations**
- **understand degree to which test is ‘proven’**

User owes Examinees:

- **Proper, fair use/interpretation**
- **Avoiding misuse of test**

Chapter 2—Reliability

- ***The test*** **- a system for collecting examples of an individual's work or behaviors in a particular area.**
- ***A scoring procedure*** **- enables the examiner to quantify, evaluate, and interpret the behavior or work samples.**

Reliability

- **Reliability refers to the consistency of such measurements when the testing procedure is repeated on a population of individuals or groups.**
- **The Standards address almost exclusively the test developers' obligations to provide information to test users.**

Reliability

Consistency, replicability of measurement on repeated use with individuals or groups

- **correlation coefficient**
- **SEM**
- **interrater reliability**

Reliability — Developers Owe Users

To enable the users to make informed judgments about the test and interpretations of test scores:

- estimates of the reliability and SEM of all scores to be interpreted
- estimates of SEM in both original scale units and the units of any derived scores
- method(s) used to compute reliability

Reliability — Developers Owe Users

- statistical adjustments made to reliability estimates
- composite reliability estimates for multi-factor tests
- estimates of inter-rater reliability, when relevant
- estimate of “local” reliability of “locally” scored test
- estimate replicability of “categorical” classifications (e.g., pass/fail)

Obligations under Standards

Developer to User:

- **accurate and appropriate reliability estimate**
- **report how estimated, including adjustments**

User to Examinee:

- **do not base decisions on unreliable test**

Chapter 3—Test Development and Revision

Test Development

- **Process of producing a measure of some aspect of an individual's KSA's**
- **Guided by the stated purpose of the test**

Test Development and Revision

- **Primer on how to develop tests**
- **Definitions of terms and concepts involved in test development (e.g., norm/criterion referencing, holistic scoring)**

Test Development and Revision

Standards focus on

- Stating the purpose
- Developing a framework
- Developing test specifications
- Developing and evaluating items
- Assembling the test

Test Development and Revision

- Document what you do
- Describe the purpose of the test and the domains to be covered (i.e., constructs, SKAPs)
- Document the test specifications
- Have SMEs review the test specifications and test items

Test Development and Revision

- Document procedures for interpreting scores
- Document procedures used to write, review, pretest, and select items
- Where scores are derived from differential weighting of test items, document the rationale and process used

Test Development and Revision

- **Document rating scales for constructed response (i.e., short answer, essay, and performance) tests.**
- **Where tests have time limits, examine the extent to which speed is a factor in test performance.**
- **Indicate clearly to test takers when a test is for research purposes only.**

Obligations under Standards

Document everything involved

- development of test specifications
- SME review of specifications and items
- procedures for interpreting scores
- procedures to write, pretest, select items
- rationale and process for any weightings
- rating scales for constructed responses
- alternate form specifications meet originals

Chapter 4—Scales, Norms, and Score Comparability

- **Focus of Standards is on converting raw scores to some form of scaled score in order to enhance the scores' interpretability and meaning.**
- **Scaling a test means choosing a scoring formula or set of formulas to accomplish the conversion.**

Scales, Norms, and Score Comparability

- Converting raw to scaled scores
- Terms and concepts in scaling, equating, etc.
- Bases for passpoints and bands
- Alternate forms

Scales, Norms, and Score Comparability

Some Definitions

- Raw score
- Scaled or derived score
- Standards or cut scores

Scales, Norms, and Score Comparability

Basis for cut scores

- **number to be hired or promoted**
- **empirical research**
- **SME judgment (e.g., Angoff, Nedelsky)**
- **Norm-referenced or Criterion-referenced**

Scales, Norms, and Score Comparability

- **Alternate forms**
- **Equating**
- **Adaptive tests**
- **Linkage, calibration, concordance, projection, moderation, and anchoring**

Scales, Norms, and Score Comparability

- **Clearly explain scales used to convert scores**
- **If specific misinterpretations of score scales are likely, forewarn the test users**
- **Describe norming population and samples clearly**
- **When norms are used to characterize groups (in contrast to individuals), the statistics used to describe the group need to be clearly explained.**

Scales, Norms, and Score Comparability

- **Clearly explain the rationale for the criterion-referenced score interpretation.**
- **Explain and provide evidence to support the equivalence of scores on alternate forms.**

Obligations under Standards

- Explain scales and meanings of scaled scores
- Explain interpretations of any scores
- Describe norming populations, process
- Explain rationale for criterion-referenced interpretation
- Document rationale for cut scores/bands
- Let SMEs work as SMEs

Chapter 5–Test Administration, Scoring, and Reporting

- **Standardized instructions/procedures increase reliability, score interpretability**
- **Standardization and test security helps insure test fairness**
- **Disability may require modified administration**
- **Examinees should be given enough information to interpret their scores**

Obligations under Standards

- Test administration should be standardized
- Modifications or disruptions of administration procedures or scoring should be documented
- Test takers should be informed of procedures for requesting and receiving accommodations in advance of testing
- The testing environment should furnish reasonable comfort with minimal distractions

Obligations under Standards

- **Instructions should indicate how to make responses and use unfamiliar equipment**
- **Eliminate opportunities for test takers to attain scores by fraudulent means**
- **Test users are responsible for protecting the security of test materials at all times**

Obligations under Standards

- **Protect the confidential nature of the reported scores**
- **Material errors found in test scores should be corrected ASAP**
- **Protect test security; prevent cheating, fraud**
- **Score accurately**

Chapter 6—Supporting Documentation for Tests

- **Objective is informed decisions by user**
- **Primary communication channel to users**
- **Should be complete, accurate, current, clear**
- **Specify nature of test, use, development process, scoring, interpretation, validity, reliability, scaling, norming, administration**

Obligations under Standards

- **Develop, as needed, appropriate user guides**
- **Document all studies and analytical procedures**
- **Keep documentation on all job analysis activities and test development steps**
- **Document the item selection procedures (Job expert use, pre-testing, etc.) used for the test.**

Obligations under Standards

- **Keep files of job specifications, announcements (minimum qualifications, duties statements, etc.) for the test.**
- **Keep documentation on all statistical analyses and passpoint setting procedures performed on the test.**
- **Keep files of any specific studies done on the test.**

Obligations under Standards

- **Keep files of ethnic and gender item analysis, etc.**
- **If the separate answer sheet response method is used and computerized tests are also developed, determine if scores are interchangeable or if the response method used affects scores**
- **Test booklets and all test related analysis materials should be properly and accurately dated.**

Obligations under Standards

- documentation understandable by user
- document uses and warn on misuses
- give reliability, validity data, if any
- specify administrator qualifications
- prove alternate forms really are
- support interpretations

Chapter 7–Fairness in Testing and Test Use

Focus of Standards is on

- **responsibilities of those who make, use, and interpret tests**
- **those aspects that are characterized by some measure of professional and technical consensus**

Fairness in Testing and Test Use

4 characterizations of fairness

1. **no bias**
2. **equitable treatment in process**
3. **equal outcomes**
4. **equal opportunity to learn content**

Fairness in Testing and Test Use

- **bias: construct irrelevancies which lower or raise scores for identifiable groups**
- **absolute fairness to all impossible**
- **(3) almost entirely repudiated**
- **Differential Item Functioning (DIF)**

Fairness in Testing and Test Use

Sensitivity Review Panels

- **Pre-Test**
- **Post-Test (DIF)**

Obligations under Standards

- **if scores differ, get validity evidence for each subgroup**
- **only use test for group if valid for group**
- **conduct sensitivity reviews**

Obligations under Standards

- conduct DIF studies when feasible
- keep verbal level to minimum valid level
- check that group differences are not based on content irrelevancies or construct under-representation
- equitable treatment during testing

Chapter 8–The Rights and Responsibilities of Test Takers

- **Fairness issues unique to the interests of the individual test taker**
- **Test takers have responsibilities**

The Rights and Responsibilities of Test Takers

- **Fair treatment promotes validity**
- **Test takers should get info on: nature of test, use, confidentiality, available accommodations**
- **Test takers have responsibilities to: prepare for test, follow directions, answer honestly, not cheat, not steal material, not violate test security**

The Rights and Responsibilities of Test Takers

- **Information about the test that is available to any test taker should be available to all test takers**
- **Test takers should be informed about test content, including subject area, topics covered, and item formats**
- **Scores of individuals should be kept confidential**

The Rights and Responsibilities of Test Takers

- Data files should be adequately protected from improper disclosure
- Test takers should be made aware that any form of cheating is inappropriate and that such behavior may result in sanctions
- Any form of cheating or behavior should be investigated promptly

Obligations under Standards

- Make same information on test available to all
- Inform test takers of content and test format
- Maintain confidentiality
- Warn of consequences of cheating
- Investigate possible cheating, fast, fairly, with appeal available for disqualification

Chapter 9–Testing Individuals of Diverse Linguistic Backgrounds

- **Centers on translated tests**
- **Any test using language is partly a test of language skill**
- **Lack of it may invalidate measure of KSA**
- **OK to test in language and at level needed for job**
- **Similar issues involved in testing some disabled candidates**

Testing Individuals of Diverse Linguistic Backgrounds

- **Design tests to reduce threats to the reliability and validity of test score inferences that may arise from language differences.**
- **Generally, the test should be administered in the test taker's most proficient language, unless proficiency in the less proficient language is part of the assessment.**

Testing Individuals of Diverse Linguistic Backgrounds

- **Bilingual individuals can vary considerably in their ability to speak, write, and read in each language.**
- **These abilities are affected by the social or functional situations of communication.**

Testing Individuals of Diverse Linguistic Backgrounds

- **Language level needed for the test should not exceed the level needed to meet work requirements.**
- **Issues associated with bilingual testing are also relevant to testing individuals who have unique linguistic characteristics due to disabilities such as deafness and/or blindness.**

Obligations under Standards

- **Design test to reduce invalidity based on language differences**
- **Give test in taker's best language, unless language is part of assessment**
- **If modified test scores comparable to original, do not "flag" modified score**
- **Test language level not to exceed job need**

Chapter 10—Testing Individuals with Disabilities

- **Modification to test format, response format, timing, setting, content**
- **Modification to eliminate construct-irrelevant differences in performance**
- **Modification should not change construct**
- **Modification should not put those with modified test at undue advantage over "regular" test takers**

Testing Individuals with Disabilities

Definitions

- **Individuals with Disabilities**
- **Accommodation**

Testing Individuals with Disabilities

Modification not appropriate under variety of circumstances

- **If test designed to assess essential skills, and would fundamentally alter construct being measured**
- **Disability such that would not influence performance on test**
- **Requested modification exceeds "reasonable accommodation" for the disability**

Testing Individuals with Disabilities

Alter the medium to present test instructions

- **For visual impairments (e.g.—Braille, large print, computer administered oversize computer screens, larger fonts)**
- **For hearing disability (e.g.—sign communication or writing)**

Testing Individuals with Disabilities

Modifying Response Format

- Allow use of preferred communication modality
  - Severe language deficit – can point to response
  - Manual disability – amanuensis, tape recorder, computer keyboard, Braillewriter

Testing Individuals with Disabilities

Modifying Timing

- **Breaks during testing**
- **Extended time**
- **Extended testing over several days**

Testing Individuals with Disabilities

Modifying Test Setting

- Individualized testing
- Location wheelchair accessible
- Tables and chairs
- Altered lighting conditions

Testing Individuals with Disabilities

Using only Portions of Test

- Waive oral test for hearing disabled
- Substitute Tests or Alternate Assessments

Obligations under Standards

- **Take steps to ensure score differences based on construct, not disability**
- **Have knowledge/expertise on test/disability interaction**
- **Pilot test**
- **Document modifications, effects**

Obligations under Standards

- Set empirical time limits, etc.
- Validate on test takers with disability
- Use an appropriate modification
- Alert users to relevant changes only

Chapter 11—The Responsibilities of Test Users

- **Primary focus is to protect those tested from improper use of tests**
- **Aimed at users who select, give, apply tests**
- **Covers issues for users to consider when performing those activities**

Obligations under Standards

- Use appropriate test
- Allow only trained persons to pick, give, interpret tests
- Know how test adds value to decisions
- Give timely, understandable results to examinees

Chapter 12—Psychological Testing and Assessment

Four uses of psychological testing

- **diagnosis**
- **intervention planning & evaluation**
- **legal & government decisions**
- **personal awareness, etc.**

Psychological Testing and Assessment

Psychological testing is used in employment testing to

- **answer specific questions about a client's psychological functioning during a particular time interval**
- **predict a client's psychological functioning in the future**

Obligations under Standards

- Users--stay in areas of competence
- “Know your tests,” pick right one(s)
- If combination of tests, use ones that “work” together

Obligations under Standards

- For differential diagnosis, test must differentiate
- Provide pretest information and results
- Train administrators and scorers
- Maintain security and confidentiality

Chapter 13—Educational Testing and Assessment

- Testing in formal educational settings
- 3 areas: routine, system-wide; selection for higher ed.; individualized/special
- Educational tests: plot KSAs vs. goals
- Stakes: effects on test-takers; the higher the stakes, the more evidence of quality needed

Obligations under Standards

- **Specify uses of mandated tests**
- **Show quality of multiuse tests for uses**
- **Norm locally**
- **Give students opportunity to learn, and to be retested if stakes high**

Obligations under Standards

- Validate placement or promotion tests
- Have qualified monitors, supervisors, score interpreters
- Test preparatioin should not affect validity
- Score reports: test date, SEM, interpretation.

Chapter 14—Testing in Employment and Credentialing

- In employment: selection, placement, promotion
- Context: candidate pool, screening in or out, sole determiner or not, applicant count, selection ratio
- Credentialing: standards for practitioner
- Test should be valid, cut score appropriate

Testing in Employment and Credentialing

Professional or Occupational Credentialing

- Tests are intended to identifying practitioners who have met particular standards.
- Qualifications typically include educational requirements, supervised experience, and attainment of a passing score on tests.

Testing in Employment and Credentialing

- **Test design requires a definition of the occupation so that persons can be clearly identified as engaging in the activity.**
- **Validation strategies rely primarily on content-related evidence.**
- **Verifying the appropriateness of the cut score is the critical element**

Testing in Employment and Credentialing

When designing and evaluating an employment test, contextual features such as the following should be considered:

- **internal vs. external candidate pool**
- **untrained vs. specialized jobs**

Testing in Employment and Credentialing

- **short-term vs. long-term focus**
- **screen in vs. screen out**
- **mechanical vs. judgmental decision making**
- **size of applicant pool relative to the number of job openings**

Obligations under Standards

- Validation: congruent with testing objectives
- Important work behaviors as criteria
- Base content evidence on thorough, explicit definition of domain, from JA
- Credentials: set cut score for performance needed, not numbers

Chapter 15—Testing in Program Evaluation and Public Policy

- **Program Evaluation: process to judge need for, value of program**
- **Typically infers from tests designed for other uses, so is secondary data analysis**
- **Tests so used should meet Standards**

Obligations under Standards

- Show quality of multiuse tests for each
- Define and validate any change scores
- Monitor impact, minimize negatives of mandated tests; maintain test integrity
- Inform legitimately interested: admin, scoring, score retention, release conditions
- Prevent misinterpretation of scores