RII NRC
2006 Exam Writers Work Shop
"Communicating Expectations
- Achieving a Common Goal"

EXAMINATION VALIDATION BACKGROUND AND STRATEGIES
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Presented by

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What is validation?

- **Validation can be defined as a process for improving the adequacy of a product.**

Why is it important to validate tests?

- **Test validation process improves the adequacy of test items and examinations.**

- **Improves test quality, validity and reliability**

- **Reduces rework**

What other experts have said on validation...

- In the words of Scriven:

- The role of validation is to discover deficiencies and successes in the intermediate versions of the new test...a debugging operation.

What other experts have said on validation...

- Komoski defines validation as:
- Evaluation (validation) is conducted during the developmental or pre-administration stage of the examination's life.
- Conceptually, it may include any sort of relevant information that can be used to improve an examination's performance while the examination is still in a dynamic enough state to be changed for the better.

What other experts have said on validation…

- **Mathenson states**:
- **that in any validation "expert appraisal and valuing are important."**

- **Geis adds**:

- **that "validation includes not only effectiveness, but also relevance and accuracy of content."**

SAT process recognizes *two* levels of validation:
INTERNAL AND EXTERNAL

- **Internal validation** occurs *during* examination product development.

- **As a process conducted *prior* to the examination, internal validation seeks to identify and correct technical and psychometric problems *before* those examinations are administered.**

INTERNAL VALIDATION

- **Improves** the instrument and reduce the number of post examination problems that might have occurred.

- **May reduce** the number of post-examination comments associated with item flaws and consequently lower the number of appeals.

INTERNAL VALIDATION

- **Expert** appraisal or peer reviews.
- Tryout on a representative sample from the job group to be tested.
- Editorial review.

- The validation process should be one that is defined, structured, and documented.

INTERNAL VALIDATION

- **Who validates the examination?**

  - **The Exam Team**

- **A small team of item writers, reviewers, and editors are involved in the examination development and review process.**

Writer/Reviewer Qualifications:

- Good item writing involves skill and art.
- To enhance the probability of success, item writers should have, as a minimum, the following qualifications:
- Experience in the job for which the test is being designed or in supervising it.
- Strong knowledge of relevant content areas for which items are being developed. The knowledge of the specialist must be substantially beyond that required to answer the test questions in his specialty area.

Writer/Reviewer Qualifications:

- **An understanding of fundamentals of psychometric principles or the accepted guidelines for writing good test items.**
- ***Interest in the examination project with motivation toward the item writing task.**
- **Ability to work in a group and openness to suggestions regarding the work.**

The TRYOUT

- **The tryout member(*s*), or pilot tester(*s*), part of the exam team, should be *more recent* job incumbents who can assess the technical accuracy of test items, answers and distractors as well as make informed decisions on operational validity, distractor plausibility, and item discrimination.**

The TRYOUT

- **Note: The exam team should remain as stable as possible. Permanent members of the team provide continuity for new examination development and can train new members.**

- **Note: Under NO circumstances should any member of the intended test group be a part of any validation activity.**

Review Forms for Internal Validation

- **Three** separate review forms follow for **conducting the internal validation.**

- **One member of the exam team can be elected to serve as the coordinator to ensure that all changes have been made; typically, this may be the editor. (Someone needs to take Ownership.)**

Review Forms for Internal Validation

- **The three forms are:**

- **Reviewer's Checklist**

- **Pilot Test/Tryout Checklist and**

- **Editor's Checklist**

Reviewer's Checklist

1. Does each test item have a documented link to important licensee tasks and K/As?
2. Facility learning objective is documented (LOs preferred but not required)?
3. Test items are clearly and precisely expressed.
4. Test items examine only one concept or topic.
5. Is there only one correct answer to the question?

Reviewer's Checklist

6. Test items include as much necessary information about the problem or situation in the stem, leaving only the solution, action, or effect for the answer.

7. Answer options that are collections of true/false statements are not used.

8. Is each question operationally oriented (i.e., is there a correlation between job demands and test demands)?

Reviewer's Checklist

9. Backward logic (items that ask for what should be provided in the stem and provide what should be required in the answer) is not used.

10. Does the question discriminate a competent licensee from one who is not?

11. Is the question at least at the comprehension-level of knowledge?

Reviewer's Checklist

12. Are tricky or irrelevant questions avoided?

13. Are the answer options balanced, homogeneous, and symmetrical?

14. The stem or demand of the question is operationally oriented.

Reviewer's Checklist

15. Is the question free of "specific determiners" (e.g., logical or grammatical inconsistencies, incorrect answers which are consistently different, verbal associations between the stem and the answer options)?

16. Is each item stated positively, unless the intent is to test knowledge of what *not* to do?

Reviewer's Checklist

17. Negative logic is used only when necessary and is HIGHLIGHTED if present. Double negatives are not used.

18. The simple answer group, "Increases, Decreases, Remains the same, Fluctuates" is not used. However, those answers combining the above with a reason are acceptable (i.e., "Increases because...").

Reviewer's Checklist

19. "None of the above" or "All of the above" and superlatives such as "most correct" or "best answer" are not used.

20. Are the 3 distractor options plausible?

21. Are common misconceptions used as distractors?

Reviewer's Checklist

22. Are the answer options of the items ordered sequentially?

23. Is the question free of trivial distractors?

24. There are no apparent clues within the examination (i.e., one test item does not give away the answer to another test item).

Reviewer's Checklist

25. The answer distributions is not predictable (e.g., "c" in not most often correct).

26. Does the question pose situations and problems other than those directly presented during training?

PILOT Test/Tryout Checklist

Instructions:

Cover the answer for the associated test item and read the test item carefully. Then, choose your answer and compare it with the keyed answer.

Answer the following questions. If any question is answered "NO," then <u>edit</u> the associated test item (red ink) or explain why the test item is unacceptable for use on the exam.

Provide any additional comments on the bottom/reverse of this page.

PILOT Test/Tryout Checklist

Answer the following with Yes or No.

1. **Does this test item require knowledge that a competent RO or SRO should possess to perform his/her job in a manner that protects public health and safety?**

2. **Is the keyed answer correct?**

3. **Are the remaining answer options plausible?**

4. **Does this test item match the identified topic and knowledge?**

PILOT Test/Tryout Checklist

5. **Can this test item be answered correctly by a candidate who has NOT received detailed systems training?**

6. **Is all terminology in this test item appropriate for a candidate?**

7. **Is this item acceptable as is, without revision?**

PILOT Test/Tryout Checklist

8. Assume 100 non-licensed examinees have satisfactorily completed LOIT. In your opinion, what percent of these individuals will be able to answer this test item correctly?

9. What percent of the job holders could answer it correctly?

Editor's Checklist
Editorial Criteria

Answer the following with Yes or No.

1. **The question is clear, concise, and easy to read.**

2. **Punctuation, spelling, and grammar is correct.**

3. **Key words are highlighted.**

Editor's Checklist
Editorial Criteria

4. Test items include as much necessary information about the problem or situation in the stem, leaving only the solution, action, or effect for the answer.

5. Is the question free of "specific determiners" (e.g., logical or grammatical inconsistencies, incorrect answers which are consistently different, verbal associations between the stem and the answer options)?

Editor's Checklist
Editorial Criteria

6. **All references needed to answer the question are included with or follow the associated test item.**

7. **Test items are numbered sequentially 1 through 100.**

8. **Exams are page numbered and the proper examination title and form appear on each page.**

9. **Exam copies are clean and clear.**