A Glimpse Behind the Curtains: Item Selection and Test Assembly

Michael Yester, Ph.D.
The University of Alabama at Birmingham

Exam Building Process

- Item Review
- Item Selection
- Evaluation as to expectation of the performance of the item.

Item Review

- Item Selection is a multi-step process:
  - First step is that all of the new questions submitted are reviewed by members of the specific committee.
  - Questions are checked for accuracy.
  - Suggestions for improvement in wording and any other corrections are made. (Editor’s comments noted.)
  - Items are classified by category (sub category) and difficulty.
  - Also, make sure references are in place.
Item Review

- The new items are entered into the DATABASE for use on an exam.
- The intent is to have a reasonable percentage of new questions on each exam.

Item Selection

- Members of each specific Exam Committee meet to put the exam together.
- From the previous work, the questions have been placed into a specific category.
- A blueprint exists for each item that dictates the number of questions (Simple and Complex) for a given category.

Item Selection

- Prior to the meeting, each member selects old and new questions for each category as possibilities.
- At the meeting the ideas for each category are combined and questions are selected.
- Start with previously used questions.
- What constitutes a good question?
Item Selection

• First, one looks at the P value.
  • P-value is the probability that a question was answered correctly among examinees.
    • Ideally would like to have the P-value ~ 70%.
  • Also, the performance over the years is checked.
  • Questions may be used again after several years have passed.
  • Good questions will be consistent performers which helps to add continuity.

Item Selection

• Next consideration is how well did an item discriminate.
  • This is done using the R-value.
    • The issue is that want each question to assess the knowledge of each individual and separate out those who know the material from those who are lacking knowledge and familiarity.

R-Value

• If all individuals who performed well on an exam got the question correct and the ones who did not do well, missed the question, the R-value will approach 1.0.
  • On the other hand if the lowest scorers get the question correct and the high scorers get it wrong, the R value will be negative.
  • The ideal is for the R-value to be positive, of the order of 0.3 is good.
  • Of course, one has to note the total number of individuals taking a particular exam.
Examples of R

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<td>02</td>
<td>C</td>
<td>E</td>
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Item Selection

- Through this process, previously used questions are selected.
- Also, if it is noted that a given item is not performing well (for instance, many are selecting the same wrong answer), then the question may be modified and answers changed.

Item Review

- New questions are examined and are selected based on the content and that different aspects of a category are covered.
- Next, Pretest items are chosen. Some new questions are chosen as pre-test items. This serves to see how well an item performs if there is doubt that it may be too hard or too easy.
- Also, alternate questions are chosen. Later on in the review process, it may be determined that a particular question may have issues so alternates are available.
Item Selection

- After the Simple category questions, which are fact based or single step calculations, complex are chosen.
- A similar process is followed, including alternate and pre-test questions.
- It takes about a day-and-a half to do this work.

Angoff

- After the exam is put together, an evaluation is made of the exam called an Angoff procedure.
- In essence, this involves rating each question by individuals knowledgeable of the material and practicing in the field.
- A question is rated whether a minimally competent individual would get the correct answer.

Angoff

- For instance, if the group consensus for a given question is 60, then it is felt that 60% of the minimally competent individuals would get the question correct.
- The actual process of using the scoring is based on a developed statistical process.
- The process helps to give an empirical value for the passing score.
The process of putting the exam together involves a number of steps as indicated.

Each step is designed to sort out the best questions that cover the material.

As noted previously, it is not easy to write good questions.

The involvement of a sufficient number of individuals helps to gather different viewpoints and to make the questions better.