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Dive Deeper into Assessment Development

8 Tips to Remember When Performing Analysis and Scoring of Test Data

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Measurement provides us with powerful tools that we can use to improve tests from the perspective of candidates, employees, and employers. This article provides tips for using these measurement tools for both items and tests.

Item analysis refers to methods used to review and improve test items.

Test review refers to techniques used to examine the stability and appropriateness of each test as a whole.

4 Tips for Item Analysis

1. **Know the item difficulty**

   Item difficulty can help you set the appropriate expectations when measuring test taker knowledge. This can help you check the appropriateness of items and associated skills for the identified content domain.

2. **Look for problematic items**

   The item discrimination can tell you if items are confusing or possibly even mis-keyed. Look out for correct answers with negative discriminations as they are problematic and should be revised before further use or just removed from the test.

3. **Make sure the distractors are plausible**

   Look at the distractors (incorrect choices) for each item to see if candidates are selecting each choice at a similar rate. If some distractors are not being chosen then they are not a reasonable option and should be reviewed.

4. **Integrate feedback**

   The item analysis is enhanced if feedback from subject-matter experts is used to support an item review. Subject-matter experts can identify items that are inappropriate for the current skill level and can provide insight into whether the test is balanced in length.

4 Tips for Test Review

1. **Build assessment confidence using reliability**

   Obtain the test's reliability coefficient (e.g., KR-20 or Cronbach's alpha). This tells you how consistent your test scores are and can provide your organization with confidence that the test being used is high quality.

2. **Seek to improve reliability**

   A reliability coefficient can be improved using Tips 1–3 discussed in the previous section. Consider an item analysis and use your assessment evaluation and maintenance cycle to find ways to improve the test for the next testing session.

3. **Check the test's validity**

   What evidence supports your interpretations of the test scores? A review of the literature or verification that your items are appropriately linked to the right skills and the job in question can inform you how much validity your test has.

4. **Support your test plan using validity**

   The body of evidence behind your test can provide critical support that your test plan and content is appropriate for the individuals you are measuring. Consider making revisions to the test plan if the test review reveals that the test content is not appropriate.

These tips provide a solid foundation to improve the quality of your assessment at both the item and test level. Test improvement is an ongoing process that requires feedback from the item development and exam form creation stages of the assessment development cycle.

Understanding Key Psychometric Terms

Review the terms below for a quick reference covering some common psychometric terms, including interpretative guidelines.

Statistic/Term	Definition	Range	Interpretative Guidelines
Proportion	Total responses for option divided by total sample size	0 to 1	
Item difficulty (p value)	Proportion of sample that chose keyed (correct) answer	0 to 1	
Distractor p-value	Proportion that endorsed the non-keyed option(s)	0 to 1	Should see similar values for each option
Correlation	Statistic that indexes the relationship between two variables.	-1 to 1	Positive correlation: as one variable increases, the other variable tends to increase also

Statistic/Term	Definition	Range	Interpretative Guidelines		
Item discrimination (point-biserial)	Correlation between keyed response and total score	-1 to 1	Below .10 .10 to .19 .20 to .29 .30+	→ → → →	Review item Low Good Very Good
Distractor point-biserial	Correlation between non-keyed option and total score	-1 to 1	Values less than .10 indicate distractors are working as expected		
Reliability coefficient	Statistic that indexes the consistency of test items. Common indices are Cronbach's alpha and KR-20. (Indicates if items are measuring the same general skill)	-1 to 1	.70 to .79 .80 to .89 .90+	→ → →	Acceptable Good High
Validity	Theory that supports our interpretation of test scores				

How can Scantron help?

Scantron has an extensive track record of providing assessment services to help thousands of customers succeed in their assessment programs. We've helped organizations with workshops and consulting on a variety of testing topics and assessment development processes. We've validated external assessment efforts and demonstrated positive business impact for various types of clients and their assessment programs.

One critical challenge is to develop an assessment plan that fulfills all of the needs of various stakeholders (e.g., public, test takers, management, and executive team). This might involve developing a traditional written assessment to be used as a pre-employment exam. It might also include a validated observational assessment to confirm compliance with organizational and industry safety protocols. Scantron can develop these deliverables using the same proven assessment development process we follow to create our own item banks and assessments—or you can choose to incorporate existing Scantron materials into your own plan. If you want to play a more active role in assessment creation, Scantron can assist with a variety of professional development activities that will instruct existing organizational resources in how to create valid test blueprints and develop quality assessment items.

Another key element is providing support to build organizational expertise. Scantron can develop your assessment elements—*and* we can provide consulting and workshops on a variety of topics, including:

- Job Analysis
- Blueprint development
- Item development plan
- Item writing and review
- Bias and sensitivity review
- Test form creation and delivery
- Statistical analysis and interpretation of results
- Custom assessment projects

Whatever the assessment assistance you need, Scantron has the products, tools, and expertise to help you ensure that you have the right program for your organization. Our comprehensive suite of assessment services helps you make the most out of your assessment development process. Whether you want to do it yourself with in-house experts and just need a little support or whether you want a partner to guide you through the overall process, Scantron can meet you where you are and help get you to where you want to be.

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