

Interpreting Biserial Correlation Scores

By Peter Connor

If you're confused about what the biserial correlation number on a Scantron report is—and what you're supposed to do with it—this should help. Biserial correlations are statistical measures indicating the strength of the relationship between the right answer for each question on a multiple-choice, fill-in-the-bubble exam, relative to the total number of correct answers for all other questions on the same exam. It is arrived at by comparing how well students did answering one question, relative to how well they did answering all the questions.

Implicit is that those who performed well on all questions should have performed well on the one being measured; those who did poorly on all should have done poorly on the one being measured. For each question, the closer to +1 the coefficient, the better the question fits with the other questions on the exam; the closer to 0, the lower—or more suspect—the value of the question. Negative correlations are often an indication that the question may need to be reverse coded. Properly interpreted, a biserial correlation coefficient will help whomever designed an exam determine whether a question should be retained, revised or removed from current and future exams.

It's a matter of percentages. Here's what a Scantron report will look like.

About This Tip

In Brief: A quick explanation of how to read and use biserial scores returned on a Scantron report.

Contributors

TILT thanks Dr. Erica Suchman, Department of Microbiology, Immunology and Pathology and Prof. Jim zumBrunnen, Department of Statistics at Colorado State University for assisting with this tip.

 [View and/or Print this Tip](#)

Related Tips:

[A Good Verb is Hard to Ignore](#)

[Composing Essay Questions](#)

[Composing Matching Questions](#)

[Composing Multiple Choice Questions](#)

[Composing Short Answer Questions](#)

[Composing True/False Questions](#)

[Designing Quantitative Tests: Remember the "Golden Rule"](#)

[Finals: Conducting Effective Review Sessions](#)

[Grading Class Participation](#)

[Grading Final Examinations and Projects](#)

[How's It Going So Far?](#)

[In-Class Student Assessment Techniques](#)

[Power Formula for Classroom Questioning](#)

[Preparing Your Students for Final Exams](#)

[Stump the Prof: A Quiz Game](#)

[Testing on What You Teach](#)

[The Quiz: A Quick Assessment Tool](#)

[What About the Questions You Ask?](#)

Exam Summary

Form A: 5 students, mean score 52.11 (range 33.33 to 78.78) **Response Frequencies**

Question	% Correct	Biserial	Question Weight	Correct Answer	A	B	C	D	E
1	80	0.48	1	A	4	0	1	0	0
2	20	-0.58	1	A	1	1	3	0	0
3	20	0.73	1	C	1	3	1	0	0
4	60	0.85	1	C	1	1	3	0	0

Here's how to interpret the Scantron report. A question returning with:

1. A **high percentage** of students scoring a correct answer, paired with a biserial correlation **greater than +.10** (see question 1 above), indicates a fundamentally good question. Those who did well on the exam

- overall, did well on this question. Such questions have a high value and should always be retained.
2. A **low percentage** of students scoring a correct answer, paired with a biserial correlation **greater than +.10** (see question 3 above), also indicates a fundamentally good question—an excellent one, as a matter of fact—the primary distinction being, the question is more difficult. Only the best students should be expected to answer it correctly. Such questions have a high value and should always be retained.
 3. A **high percentage** of students scoring a correct answer paired with a biserial correlation **greater than -.10** but **less than +.10** suggests a relatively easy question or, one that may be simply too easy for the test. A mediocre percentage of students—**say between 50% and 70%**—scoring an answer correctly, but paired with a similar biserial correlation, may be removed or reworded. [**Note:** No hard and fast rules here—this is an instructor call.]
 4. A **low percentage** of students scoring a correct answer paired with a biserial correlation **less than -.10** (see question 2 above) indicates a question that may be keyed wrong or need to be reverse coded. There is something wrong, either in wording, scoring, syntax, and/or content. Those who did poorly on the exam are more likely to score a correct answer than those who did well. Without revision, the question has no value and the instructor should consider its removal. [**Note:** the instructor should check to see that the answer was properly keyed in to the computer—unintentional input errors will almost certainly skew results.]

[Disclaimer](#) | [Privacy](#) | [Equal Opportunity](#) | [Search CSU](#) | [CSU Directory](#) | [CSU A-Z](#) | [Copyright © 2006-2014](#)