

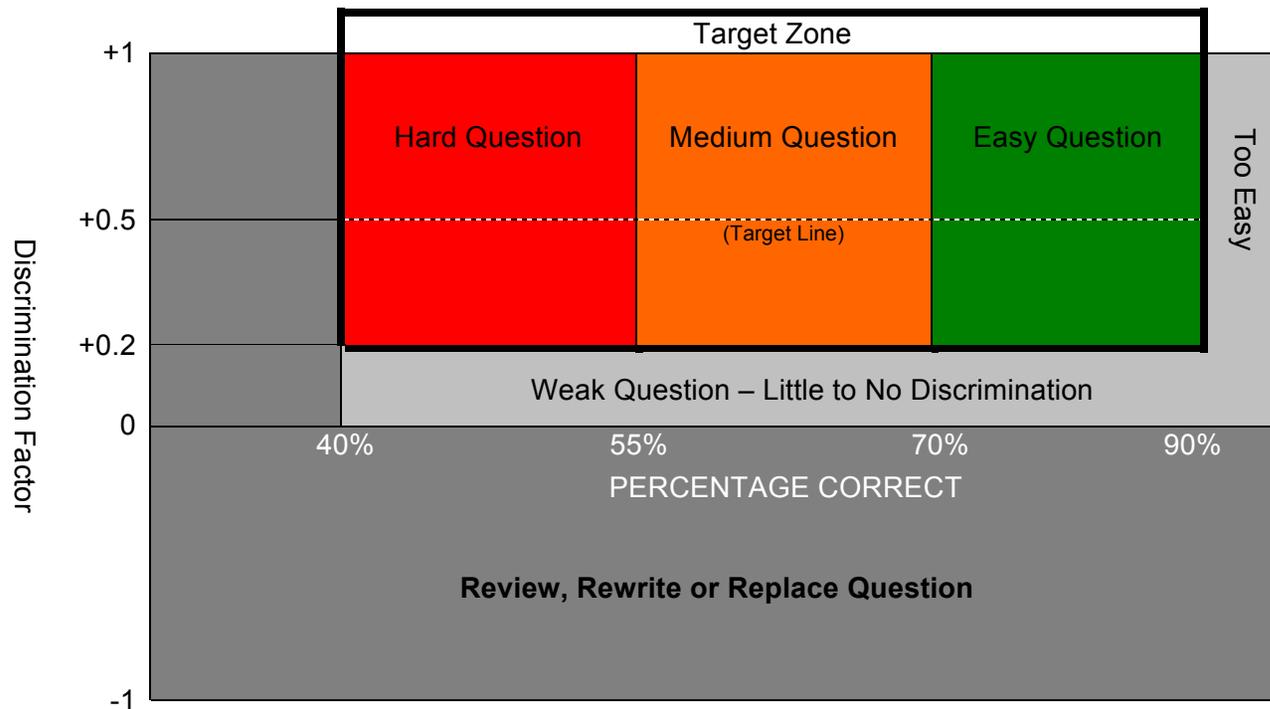
# Assessment Item Analysis

## Discrimination Factor and Test Reliability

### Discrimination Factor and Percentage Correct

Discrimination Factor is an index scaled between +1 and -1. It measures the ability of a question to correlate a student's performance on a question and a student's overall performance on an assessment. The larger the positive discrimination factor ( $> +0.2$ ) the greater the correlation. In other words, students who scored well on the assessment, scored well on the question and students that didn't score well on the assessment, didn't score well on the question. A negative discrimination factor indicates a reverse correlation. Students who scored well on the assessment, scored poorly on the question and students who scored poorly on the assessment, scored well on the question. (See page 2.)

Percentage Correct is the number of questions answered correctly divided by the total number of questions on the assessment.



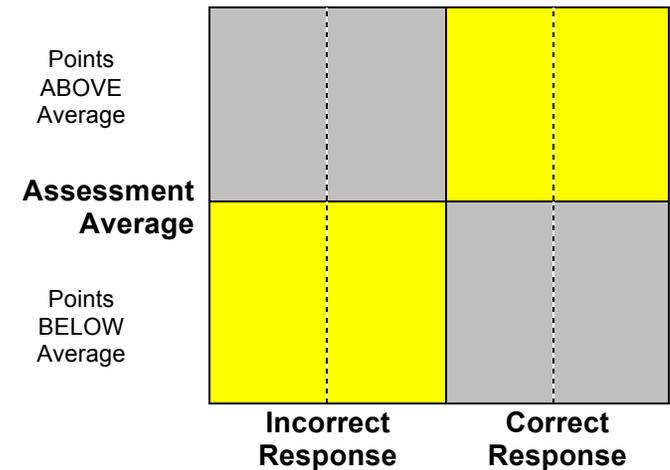
## Discrimination Factor – Simplistic Representation

The discrimination factor is cumbersome and time consuming to calculate without the aid of a computer spreadsheet. Here's the equation:

$$\text{Discrimination Factor} = \frac{\sum_{i=1}^n (SA_i - \bar{A})(SQ_i - \bar{Q})}{\sqrt{\sum_{i=1}^n (SA_i - \bar{A})^2} \sqrt{\sum_{i=1}^n (SQ_i - \bar{Q})^2}}$$

- SA is the student's score on the assessment
- A is the assessment average
- SQ is the student's score on the question
- Q is the question average

A **quick** and **easy** way to visualize the discrimination factor is to plot the assessment results. Select an assessment question to analyze. Plot the number of points each student's assessment score is above or below the assessment average versus their question response (correct or incorrect) along the dotted line. Scores that lie in the yellow squares have a direct correlation and scores that lie in the gray squares have a reverse correlation. The number of points plotted will equal the number of students that took the assessment. Draw a line of best fit. The slope of the line of best fit represents the discrimination factor. Positive slope = positive discrimination factor; negative slope = negative discrimination factor. Repeat this process for each assessment question to be analyzed.



## Test Reliability

Test reliability is a measure of the likeliness that the test will produce consistent scores. It is scored on a scale between 0 and 1. Test reliability depends on item discrimination factors, number of questions and diversity of subject matter tested.

