

What is Predictive Validity?

Authored by
stats writer

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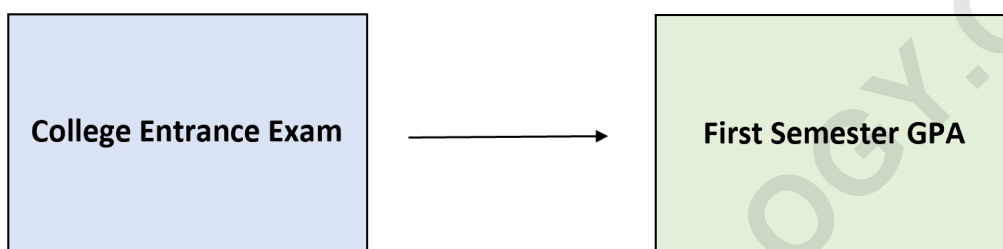
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Predictive validity is a measure of how well a test predicts a certain outcome. It is used to determine how well test scores can be used to predict future performance or behavior in a certain situation. Predictive validity is important for evaluating the effectiveness of tests. It is calculated by comparing test scores with the outcomes of the same individuals in a later period of time.

In statistics, the term **predictive validity** refers to the extent that it's valid to use the score on some scale or test to predict the value of some other variable in the future.

For example, we might want to know how well some college entrance exam is able to predict the first semester grade point average of students.



To determine if predictive validity exists, we could use the following process:

Administer the college entrance exam to 1,000 seniors.

One year later, collect data on the first semester GPA of the same 1,000 students.

Calculate the between the scores on the entrance exam and the first semester GPA.

If there is a high correlation between scores on the entrance exam and the first semester GPA, it's likely that there is **predictive validity** between these two variables.

In other words, the score that a student receives on this particular college entrance exam is *predictive* of the GPA they're likely to receive during their first semester in college.

For example, students who score high on the entrance exam also tend to earn high GPA's during their first semester. Conversely, students who score low on the entrance exam tend to earn low GPA's during their first semester.

Technical Notes:

Predictive validity is a type of criterion validity, which refers to how well the measurement of one variable can predict the response of another variable.

One variable is referred to as the while the other variable is referred to as the response variable or .

In our previous example, the explanatory variable would be the entrance exam and the criterion variable would be the first semester GPA.

Examples of Predictive Validity

The following examples illustrate a few more scenarios where we might calculate predictive validity.

Example 1: Pre-Employment Test

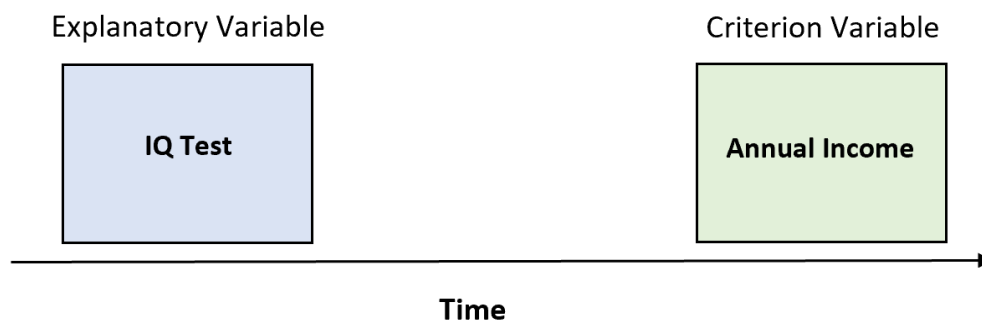
A company might administer a 40-question pre-employment test to all individuals they hire and then rate the employee productivity one year later.

If there is a high degree of correlation between the scores on the test and the employee productivity, then we can say that it's valid to use the test to predict the future productivity of the individual.



Example 2: IQ Testing & Income

Researchers might administer an IQ test to 100 individuals and then track the annual income of those individuals 10 years later.



Example 3: Physical Fitness

A personal trainer might administer a fitness test to NBA rookies and then record the average points per game scored by the players during their next five years in the league.

If there is a high degree of correlation between the scores on the fitness test and the average points per game scored by the players, then the personal trainer can say that it's valid to use the test to predict the future points per game of players.



What is Considered High Correlation for Predictive Validity?

There is no specific value that is considered to be a "high" correlation between two variables. However, the higher the correlation between a test and the construct it sets out to measure, the higher the predictive validity of the test.

For example, if the correlation between a pre-employment test and the employee productivity one year later is **0.86**, this test is more predictive of employee productivity compared to a test that only has a correlation of **0.35**.

However, even a correlation that seems quite low (like $r = 0.35$) can still be useful to an employer because it gives them at least some sense of how productive the employee is likely to be.