Computing Accuracy Ratios

If we measure skills on the percentage correct scale, we impose a constraint on our ability to assess the relationship between correct and incorrect movement cycle frequencies. When errors fall to zero per minute, the scale registers 100% correct regardless of the frequency of correct responding. Yet, because frequencies of correct responding may in fact vary a great deal when errors are at zero, individual differences in accurate performance may be masked by such an insensitive measurement scale. For example, 100% accurate performances of 5/minute, 50/minute or 500/minute would all appear at the 100% correct ceiling on a percentage scale. But such differences in performance of the same skill would imply very different instructional decisions.

In conjunction with the Standard Behavior Chart, we can use the Accuracy Ratio as a measure of accuracy which has no ceiling. It is simply the numerical ratio between correct and incorrect movement frequencies which reflects the distance on the chart between the two points in the accuracy pair.

If either of the frequencies in the ratio is a zero frequency -- which would be charted as a question mark just below the record floor or "time line" on the Standard Chart -- we use the value of the record floor in its place when computing the Accuracy Ratio.

This same ratio might be called a Replacement Ratio when it reflects the relationship between a "problem behavior" deceleration target frequency and the frequency of an appropriate behavior chosen as an acceleration target and charted together with the problem behavior frequency as a "fair pair." And the ratio is called an Independence Ratio when it compares frequencies of prompted versus unprompted movement cycles.

To compute the ratio:

1. Divide the larger of the two frequencies to be compared by the smaller. (Thus, the larger number is always on top of the fraction and the ratio is always greater than or equal to 1.0.) If either frequency = 0, use the value of the record floor (e.g., .1/minute for 10-minute session) in its place.

2. If the acceleration target frequency (corrects, independent or appropriate movement cycles) is the larger, call the ratio "times ---" or "x ---." If the deceleration target frequency (errors, prompted, or inappropriate movement cycles) is larger, call the ratio "divide by ---" or "÷ ---." Notice that the numerical value of the ratio equals the distance measured on a Standard Behavior Chart between the two points. If you place the 1.0-line on a rate-finder or vertical strip of the Standard Behavior Chart next to the lower of the two charted frequencies and read it at the point next to the higher of the charted frequencies, you will find that the value you read is equal to the Ratio you have computed.

Examples

A) 20 corrects per minute and 5 errors per minute:

$$\frac{20 \text{ corrects}}{5 \text{ errors}} = \times 4.0$$

Read as: "corrects are errors x 4.0".

B) 5 corrects per minute and 20 errors per minute:

$$\frac{20 \text{ errors}}{5 \text{ corrects}} = \div 4.0$$

Read as: "corrects are errors ÷ 4.0"..

C) 10 corrects per minute and zero errors with a 2-minute assessment (.5/minute record floor):

$$\frac{10 \text{ corrects}}{.5} = \times 20.0$$

D) 50 corrects per minute and zero errors with a 5-minute assessment (.2/minute record floor):

$$\frac{50 \text{ corrects}}{.2} = \times 250.0$$

E) 5 inappropriate per minute and zero appropriate with a 20-minute observation period (.05/minute record floor):

$$\frac{5 \text{ inappropriate}}{.05} = \div 100.0$$

It is easy to convert Accuracy Ratios back into percentage values for those who are unfamiliar with the measure, such as administrators or other teachers. For example, a x 3.0 A.R. means there are three times as many corrects as errors -- the equivalent of a 75% correct score. However, because the Accuracy Ratio allows us to be so much more sensitive to individual differences and because it is really a rather easy concept to explain (i.e., it simply tells the correct frequency as a multiple or fraction of the error frequency), we should attempt to teach this form of measurement to others rather than simply translating it for them.

Behavior Prosthesis Laboratory
Box 158
Belmont, Massachusetts 02178
(617) 894-3600, ext. 273