

# You Don't Need a Special "Reasoning" Test to Implement and Evaluate Reasoning Training

There is no need to separate tests of reasoning skills; most of the aptitude and achievement tests already in use do an adequate job of assessing thinking abilities.

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With the recent emphasis on teaching reasoning, many educators are wondering whether special tests are needed to evaluate reasoning ability. Much research suggests that the answer is often *no*.

For example, Morante and Ulesky (1984) reported on New Jersey's attempt to measure pure reasoning ability of freshmen entering state colleges. Specifically, the objective was to identify a reasoning ability beyond that already tapped by the New Jersey Col-

lege Basic Skills Placement Test (NJCBSPT), for which the verbal and mathematics sections already had questions designed to "require understanding and thinking."



“... a school can determine whether it is using ... [a reasoning] program effectively by plotting reading comprehension gains over one year (or preferably two years) of training.”

Figure 1 shows the correlations of three reasoning tests with the subtests of the NJCBSPT. Overall, the correlations are positive and quite high. For example, the Whimbey Analytical Skills Inventory (WASI) correlated .70 with the algebra subtest and .76 with reading comprehension. These correlations are theoretically interesting because the WASI contains no algebra questions or reading passages; instead, it is composed of the following type of analytical thinking problems (Whimbey and Lochhead, 1982).

- *Elephant is to small as \_\_\_\_\_* is to \_\_\_\_\_
  - a. large: little
  - b. turtle: slow
  - c. hippopotamus: mouse
  - d. lion: timid
- Write the two numbers that should appear next in the series.  
3 9 5 11 33 29 \_\_\_\_\_
- In a different language, *liro cas* means “red tomato,” *dum cas dan* means “big red barn,” and *xer dan* means “big horse.” What is the word for *barn* in this language?  
a. dum b. liro c. cas d. dan e. xer

The high correlations of the WASI with the NJCBSPT subtests suggest that these analytical thinking problems tap the same mental processes used in mastering and applying algebra and in comprehending prose. (The ability common to all such tests was recognized statistically by Spearman in 1927 and named “g” for general reasoning ability.)

Practically, the high correlations mean that there is generally little value in administering a separate reasoning test like the WASI if scores on a battery of aptitude and achievement tests such as the NJCBSPT are already available for students. Figure 1 shows that scores on both the WASI and the New Jersey Test of Reasoning could be predicted quite accurately from the Reading Comprehension subtest of the NJCBSPT. Even better, scores from the Reading Comprehension and Computation subtests could be combined statistically, balancing out specific verbal or mathematics knowledge, to produce about as accurate a measure of general reasoning ability as from either of the “reasoning” tests.

Scores on the Cornell Critical Thinking Test could not be as accurately predicted from the NJCBSPT since the correlations are lower across the board. This could mean that the Cornell test measures some special reasoning ability less related to academic performance and takes on greater importance elsewhere; however, research studies presented in the Cornell manual argue to the contrary. Follman, and others (1969) factor-analyzed the Cornell and other critical thinking tests (such as the Watson-Glaser) along with academic aptitude and achievement tests, but were unable to pinpoint a separate critical

**Figure 1. Correlations Between Three Thinking Tests and Various Sections of the New Jersey College Basic Skills Placement Test**

Name of Test	New Jersey College Basic Skills Placement Test				
	Reading Comprehension	Sentence Sense	Computation	Elementary Algebra	Essay
Cornell Critical Thinking Test N = 512	.68	.62	.49	.40	.44
Whimbey Analytical Skills Inventory N = 513	.76	.75	.76	.70	.56
New Jersey Test of Reasoning N = 643	.82	.81	.67	.59	.69

**"The reasoning skills students develop will be manifested as accelerated improvement in reading ability; no special test is needed."**

thinking factor. They concluded that "much of the critical thinking ability is measured by the achievement and/or aptitude tests." Moreover, the reliability studies presented as statistically adequate by the examiner's manual reveal that the reliability of the Cornell is under .70. This low reliability limits the degree to which the Cornell can correlate with any other test and accounts for its low correlations with the NJCBSPT. In short, there is little evidence that the Cornell, WASI, or New Jersey Test of Reasoning measures any major reasoning skills that are not also measured by the NJCBSPT.

Another argument against special "reasoning" tests comes from a review of three major programs for improving reasoning ability. Program designers maintain that the reasoning skills they teach are, indeed, important for academic success, and research supports this position. For example, Lipman (1984) wrote: "Reasoning ... is *not* the fourth R. It is, instead, foundational because it is fundamental to their [reading, writing, speaking, listening, computation] development."

While Lipman's *Philosophy For Children* uses verbal exercises and is root-

ed in formal logic, two other successful reasoning programs have different orientations. Feuerstein's *Instrumental Enrichment* uses nonverbal material to teach classification/comparison, orientation in space, recognizing relationships, following directions, planning, organizing, logical reasoning, inductive and deductive reasoning, and synthesizing. *Strategic Reasoning* (Citron and Glade, 1985) uses both verbal and nonverbal exercises to teach students to recognize characteristics, classify information, make operational and structural analyses, and reason by analogy. All three programs emphasize modeling and group discussion of the thinking used in solving problems. Most pertinent to the testing issue, all have been shown to improve reading comprehension scores in a number of school settings (Benderson, 1984; Zenke and Alexander, 1984). In other words, a school can determine whether it is using one of these programs effectively by plotting reading comprehension gains over one year (or preferably two years) of training. The reasoning skills students develop will be manifested as accelerated improvement in reading ability; no special test is needed.

There are numerous time-proven, standardized academic aptitude and achievement tests, such as the Degrees of Reading Power, California Achievement Tests, Differential Aptitude Tests, and the Scholastic Aptitude Test, which are practical indicators of students' analytical skills. As education embarks on a major effort in teaching reasoning, the observation Buros made in the first edition of *Tests In Print* (1961) seems particularly timely:

At present, no matter how poor a test may be, if it is nicely packaged and if it promises to do all sorts of things that no test can do, the test will find many gullible buyers. □

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