

A Closer Look at Nonverbal IQ Tests

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By analyzing the formal requirements on nonverbal IQ tests, it is possible to demonstrate that all such tests (excluding mazes and certain other sensory-motor tasks) require access to abstract ideas attainable only through conventional linguistic signs. The case is made with Raven's Progressive Matrices and Cattell's Culture Fair Tests which are commonly cited as the best 'nonverbal' tests ever produced (Jensen 1980, pp. 648ff; Herrnstein & Murray, 1994). Jensen (1980) said, 'virtually all subjects can catch on to the requirements of the task without verbal instructions' (p. 132).

However, access to any conceivable abstract idea (i.e., any comprehensible or translatable thought about objects, relations between objects, relations between relations, etc.) absolutely requires conventional signs of the linguistic kind. Perceptual icons (i.e., signs derived from seeing, hearing, touching, tasting, or smelling) are inadequate because they are private and nontransferable. Similarly, movements (e.g., pointing) cannot assure communication between persons because of the universal degeneracy of indices. Thus, nonconventional bodily movements (signed languages excluded) are a proper subclass of indices. Pointing to a square on a sheet of paper, or a blackboard, or to an orderly, for example, or to any conceivable object leaves the interlocutor well short of knowing for sure what is being pointed at. Anything along the line is a possible candidate. Is it the square? The paper? The desk under the paper? Even touching the object does not identify it unambiguously. Is it the square itself that is touched? The edge or a particular corner, or the point where the lines join? Etc., etc., *ad infinitum*?

The degeneracy of every index is owed to its resemblance to a line. Although any finite movement along a line has two ends, just where either end is pointing is problematic. With respect to the *origin*, so long as only one person is gesturing (or 'pantomiming'), there is little problem, but when it comes to the *terminus*, the difficulty is acute. In giving instructions for nonverbal IQ tests, the experts have sometimes had more than one pantomimer. In these cases, the origin of gestures is indeterminate. The subject may be looking at the wrong person and there is no way, from gestures alone, to be certain who has the floor. Is it the test-administrator? Or the orderly at the blackboard? IQ testers, from about 1917 forward, supposed that mere 'pantomime' could be added to perceptual signs so as to obviate the need for linguistic signs. But they were naive in this. Only symbols, i.e., concepts that require *conventional linguistic signs to define them*, escape the degeneracies of icons and indices.

To demonstrate practically that the instructions cannot be pantomimed adequately by any stretch of the imagination, consider the 'sample item' in Figure 1 taken from the published introduction to the Cattell Culture-Fair Intelligence Test. As an imaginary experiment, the reader may want to try to guess the instructions. A more difficult challenge is to invent a pantomime presentation to show a group of uninformed subjects how to complete it. Finally, as

a clincher, have someone translate the instructions into Vietnamese, Mandarin, or Navajo, and see if anyone who does not know the

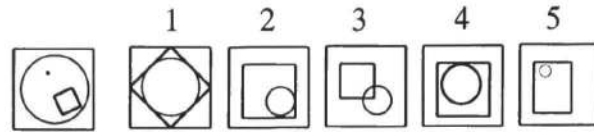


Figure 1: A sample from the Cattell nonverbal IQ test.

language of the instructions can figure them out from gesture and pantomime. (The actual instructions are to find the figure on the right where the dot can be placed in the same relation to the circle and the square that it has in the one on the left.)

Even in open-ended IQ tasks (as seen in certain individually administered tests, e.g., the Goodenough-Harris Draw-a-Man Test) the suitably intelligent sign-user is expected to be able to produce a response at a degree of socially recognizable appropriateness greater than zero. Any such claim in behalf of the validity of any test, however, is tantamount to the confession that every item of that kind *must* rely on acquired proficiency in some language in order for the persons tested to gain access to the meanings at stake. As a consequence, the solving of any meaningful (potentially valid) nonverbal IQ item depends on access to signs that are both general and conventional. But signs with these properties, owing to the arbitrariness of their surface-forms, are indistinguishable from the semantic content of linguistic signs and are accessible only through linguistic signs.

Language abilities are, therefore, the main source of variance in IQ tests. The language factor is owed to (1) differences in the languages and dialects used by testers, (2) differences in the accessibility of those languages and dialects to the persons tested, and (3) consequent differences in the accessibility of the information to be manipulated or supplied in the tests. The language factor not only constitutes the main source of variance in 'verbal' IQ scores, but more importantly, in 'nonverbal' IQ scores. It is commonly admitted that verbal IQ scores are the best predictors of nonverbal ones, and that the latter are the primary definers of Spearman's *g*. Therefore, the language factor is the primary basis for *g*. Consequences for language minorities are enormous (Oller, in press).

References

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