

## Scan Request Slip


**Request Number:** 14453

November 18 2017

The evolution of psychology : fifty years of the American psychologist / edited by Joseph M. Notterman.  
Washington, DC : American Psychological Association, c1997.

xxv, 783 p. : ill ; 26 cm.

1557984735

On Loan	Sublibrary	Item Status	Collection	Call Number	Description	Barcode
<input type="checkbox"/>	Osler	Regular Loan		BF 105 E93 1997		

Mr Kyle William Dewsnap  
kyle.dewsnap@mail.mcgill.ca

**Patron Barcode:**



**Status and Type:** McGill undergraduate - McGill Student (SR)

**Request No.:** 14453

**Request date:** November 18 2017

**Author:** Weschler, David

**Title:** Cognitive, conative, and non-intellective intelligence

**Pages:** Chapter 2

**Additional Info:** Thanks!

Declined Reasons: Circle the reason the scan request cannot be filled. Then scan and send this slip to docdel.library@mcgill.ca

1. The item requested is missing from the shelf.
2. The item requested is available online (for use by Central Docdel).
3. The citation provided does not match the contents of the journal/book.
4. For reasons of copyright the scan request cannot be supplied.
5. Other: please describe.

# COGNITIVE, CONATIVE, AND NON-INTELLECTIVE INTELLIGENCE

DAVID WECHSLER

*In his lecture as president of the Division of Clinical and Abnormal Psychology, this world-renowned expert in intelligence testing describes what is now contemporary understanding of general intelligence. He holds that intellectual ability cannot be measured independently of drive, temperament, or emotion.*

It is always a good omen for science when different men in different places make independent discoveries or arrive at similar conclusions. In the last two decades psychologists in their efforts to define the nature of general intelligence seem to have arrived at the threshold of such a situation. In this paper I wish to present to you what appears to me to be the germ of the impending re-orientation: it is this, that general intelligence cannot be equated with intellectual ability however broadly defined, but must be regarded as a manifestation of the personality as a whole.

From an historical point of view, the first one to argue against the

Reprinted from the *American Psychologist*, 5, 78-83. Copyright © 1950 by the American Psychological Association.

Address of the president of the Division of Clinical and Abnormal Psychology, given at Denver, Colorado, on September 5, 1949.

identification of general intelligence with intellectual ability was Henri Bergson. Already in his "*Dones Immediate de la Conscience*" and more emphatically in his "*Evolution Creatrice*," he pointed out the insufficiencies of the human intellect or, what was for him the same, normative logic, in dealing effectively with man's total environment.

I shall not here restate Bergson's arguments nor his attempted solution of endowing the human mind with a new faculty, creative intuition, and its generating force, the "elan vital." I wish only to call your attention to the fact that in our attempts at measuring intelligence we have persisted in treating intelligence as if it consisted exclusively of intellectual elements or factors. What, in fact, are these intellectual elements which we have continued to use and to posit in appraising intelligence? They are abstract reasoning, verbal, spatial, numerical, and a few other specified factors, all of which in some particularized manner deal with man's cognitive ability. Shades of Bergson, are we confirming his claim that human intelligence, as the psychologist conceives it, can only deal with geometric and logical symbols?

Now, the remarkable thing is that while this is what we are saying in our tests of intelligence, most of us don't believe it. What is more important, it isn't true! Our contemporary definitions of intelligence assert as much: intelligence according to these is not only the ability to learn, to abstract, to profit from experience, but also to adjust and to achieve. Everyone with clinical experience knows that the latter involve other capacities besides educative, verbal, numerical, spatial, and the other intellectual factors that have been demonstrated. Yes, but what are they? The answer is: they are *not* intellectual. They are capacities and traits dependent upon temperament and personality which are not restricted to logical and abstract perception; they are, in my opinion, factors of personality itself. It is this point of view, independently sensed or suggested, at times only tangentially, by a number of investigators including Goldstein, Alexander, Wechsler, and more recently by Halstead and Eysenck, which I presented six years ago for the first time under the term "*Non-intellective Factors of Intelligence*." I wish now to present to you more fully the evidence in its support and to justify what appears to be not only the need for a re-orientation in our concept of general intelligence, but of a new psychometric that will, in fact, measure what is purported in our definition of intelligence.

Let me begin by restating the issue in terms of the actual psychometric problem. The crux of this problem, as we have already noted, is the discrepancy between what the clinical psychologist does and what he says he does in clinical practice. If we examine any of the current psychological tests of intelligence, we shall find them to consist of sample tasks measuring, by definition, a variety of mental abilities. One would imagine that any summary of the results obtained with such tests would be essentially a

report of the degree to which an individual possesses these abilities and the manner in which they vary. However, it will be found that once a summative score is obtained from them, whether in terms of MA, IQ, or whatnot, the clinical psychologist proceeds to enlarge his summary to include not only specific psychologic interpretations but broad social and biological implications as well.

An IQ is thus used, not only to determine comparative mental endowment, capacity to learn, presence of special abilities and disabilities, and evaluation of degree of mental deficiency, but also as a basis for school placement, for vocational guidance, for psychiatric diagnosis, and for the prediction of adjustment potentials in a variety of situations from infancy to old age, including such areas as child adoption, juvenile delinquency, fitness for military service, college success, and old age counseling.

Assuming that intelligence tests may be used in all these situations, and within limits I believe they may, the question arises how this is possible under the concept that general intelligence is a matter of a single basic or even a combination of a number of intellectual abilities. It is this question which I shall try to answer this evening. But I must first call your attention to the fact you are all aware of, that this is not the usual criticism of intelligence tests. The historic and continued objection to intelligence tests is not that they measure too much, but that they do not measure enough, or at least, not well enough.

You are all acquainted with the arguments against intelligence tests, and I shall not repeat them; the damaging criticism pertains, not as is generally emphasized, to the question of reliability, but to one of basic validity. Even such studies as those of Wellman, Goldfarb and others, showing changes in IQ produced by a variety of social and environmental factors, though relevant, are not crucial. The crucial instances are those where individuals obtain identical IQs (say an IQ of 65) but, on overall appraisal, must nevertheless be rated differently, say, one as a defective and the other as not defective. Such instances are not necessarily common, but neither are they rare exceptions. Here is a situation which needs explaining and cannot be by-passed.

The first to attack this problem was E. L. Thorndike. His answer, as always characteristic of his approach, was straightforward and to the point. Our tests measure intelligence to be sure, he said, but there is not just one unique, but several different kinds of intelligence, namely, abstract, social and practical. The first is manifested by the individual's ability to work with symbols, the second by his ability to deal with people, and third by his ability to manipulate objects. Thorndike, himself, seems to have been primarily interested in the first kind of intelligence and, having made the above trichotomy, and along with it the distinction between tests which measure breadth, as against those which measure altitude, left the working

out of these concepts to others. But relatively little has been done to verify or refute the hypothesis.

In the 1920's Moss published a test of social intelligence which consisted essentially of items involving memory and recognition of names and faces, and a series of multiple-choice questions involving social situations, in which the correct answer seemed to have been based on the notion that "the customer is always right." Although Moss's test for a time had some vogue among business firms, clinical psychologists, as far as I have been able to discover, seldom if ever make use of it.

The other important effort at producing a test of social intelligence is Doll's Vineland Social Maturity Scale. This Scale, as you know, consists of a series of questions listing a variety of social acquisitions, that is, of approved and useful acts and achievements, which a child may be expected to have learned from infancy to adolescence. The Scale is hardly a test in the ordinary sense of the term, since it involves no test performance or response by the subject, and can be completed, as it usually is, by other persons. But it does correlate fairly well with other tests of intelligence and has been shown by Doll and others to correlate positively and significantly with a number of practical criteria of social adjustment.

Clinical psychologists appear to have accepted performance tests, almost from the start, as a measure of practical intelligence. Only they seem to have regarded practical intelligence, as measured by these tests, as a kind of special aptitude rather than as a kind of intelligence. For many years the situation in clinical practice was something like this: a child would be given routinely a Binet test. Then, if his Binet MA did not seem to do justice to him, he would be given a Pintner-Paterson or similar performance battery as a supplementary test. But the child's score on the performance test, except in instances of language handicaps, would seldom be integrated with, or serve to alter, his Binet intelligence rating. Instead, it would usually be used as evidence of a compensatory useful special ability. Thus, if a child attained an IQ of 85 on the Binet, and one of 110 on the Pintner-Paterson, the reporting psychologist would ordinarily give the rating as "dull normal" intelligence with good practical or manipulative ability. It was not until the publication of the Bellevue Scales that any consistent attempt was made to integrate performance and verbal tests into a single measure of intelligence. The Bellevue tests have had increasingly wider use, but I regret to report that their popularity seems to derive, not from the fact that they make possible a single global rating, but because they enable the examiner to obtain separate verbal and performance IQ's with one test.

The Aristotelian hierarchical white-collar concept of intelligence dies hard. This, in spite of the fact, that performance tests often can and do contain a larger amount of *g* than do the verbal tests. Thus, in his differential study of "Abstract and Concrete Intelligence," W. P. Alexander, after

correcting for communality, specific factors, and chance errors of measurement, found the theoretical  $g$  loadings for verbal and practical ability to be .60 and .81, respectively. Alexander concludes that "a perfect performance battery would be a better measure of  $g$  than a perfect verbal battery."

This and other findings by Alexander bring me to what constitutes the most compelling evidence for the reorientation in our concept of intelligence mentioned at the onset of this paper. I refer to the findings contributed by factor analysis. Here two important names appear on the horizon: Carl Spearman and L. L. Thurstone. I believe that the answers which they have given to the problem of the nature of general intelligence are incorrect. But I am sure that without the inspiration and without the tools which they furnished us, the solution of the problem would be altogether impossible.

Such a statement before a gathering of clinical psychologists may be unorthodox, because to many, factor analysis is almost anathema. But I can assure you, on the authority of expert consultants, that the mathematics of factor analysis is quite elementary, and on the basis of my own experience with it, extremely practical; and, with due apologies to Freud, even "sexy." For with what, in effect, does factor analysis concern itself, but with the bedfellowship of psychometric tests. For, mind you, it embraces matrices, correlational to be sure, and then tells you what test stays close to what other tests when axes are rotated. Now that, I submit, is what clinical psychologists want to know: what test, what factor, or, if you will, what function or what trait goes with what other factor, or function, or trait. And when the findings are examined some very interesting and unexpected relationships come to light. For example, some tests of intelligence, like some human beings, are extremely promiscuous. Thus, vocabulary, the paragon of verbal tests, correlates very frequently, and to a considerable measure, with Block Designs, the perfect example of a performance test. But to return to a more serious vein, the importance of factor analysis is, of course, that it enables us to discover what our tests measure and the extent to which they measure the things they purport.

What are the elements which factor analysis has shown our intelligence tests to measure? The first is abstract reasoning. This is Spearman's  $g$  or education. Spearman argued that  $g$  was the only independent factor, and while he hesitated to identify  $g$  with general intelligence, his actual applications are tantamount to it. In equating  $g$  with general intelligence Spearman was in error, not because the tetrad equation is incorrect but because, in point of fact, it is not satisfied as he claimed. Spearman's answer to this finding was that we cannot expect the tetrad equation to be satisfied by all the tests of general intelligence but only by "good" tests of intelligence, like analogies and mathematical reasoning which require education. But of course, if you select your tests, you can choose them so highly saturated with a single factor that the residuals vanish. This is all that the

tetrad equation says, and it was the perceptive insight of Thurstone which recognized the tetrad equation for what it was, namely, a mathematically special case of a more general solution of the factorial problem. What was needed was a statistical analysis which would permit the emergence of other factors when present. By the use of his expanded technique, it has now been shown that intelligence tests, such as they are, contain not one but several independent factors. Some five or six have been definitely identified; they are, to repeat, induction, verbal, spatial, numerical, and one or two other factors. Notice, however, that these factors, like Spearman's education, are all cognitive.

At this point it is important to bear in mind what a factor stands for in factor analysis. Basically, it is an identifiable independent variable which accounts for a certain portion of the total test variance in a correlational matrix. The amount of variance it accounts for in any given test is called the test's factor loading. In a perfectly factorialized correlation matrix, the sum of the factorial loadings of the extracted factors should be 100 per cent, that is, account for the total test variance.

Now, it is a remarkable finding that when matrices of intelligence tests are factored, the amount of variance accounted for is seldom more than 60 per cent of the total, and, what is perhaps of equal significance, the greater the number of different tests included, the smaller, generally, the total per cent of variance accounted for; and this is seemingly independent of the number of factors extracted. In the case of our present intelligence test batteries, factors beyond the first 3 or 4 usually contribute so little to the already accounted-for variance that it is generally not profitable to extract them. It is the observation of this important finding that in the factorialization of batteries of intelligence tests, there always remained a considerable per cent of unaccounted-for variance, which began to arouse my interest some years ago. It seemed to hold the key to our problem.

If after successive attempts at factoring out all the components of intelligence, there always remained a large residue of these unknown elements, the obvious inference to be made was that our intelligence tests measured other things than those accounted for by the extracted factors. The second inference was that those other factors were numerous and occurred in relatively small amounts, because it was impossible to extract single additional factors which would account for any considerable portion of the residual variance. I assumed that the principal reason for this was that the test batteries usually factored did not include tests which contained sufficient amounts of these other factors, to enable some of the remaining tests to cluster about them. Provisionally I called these residual components the nonintellective factors of intelligence. But in terms of more recent findings, I believe they can be more justly designated as the personality components of general intelligence, which in fact they are.

The evidence for this conclusion comes from a number of sources. As early as 1913, Webb, (8), in factoring a battery of tests, along with a number of ratings which attempted to appraise traits of character, was able to extract a factor "W." "W" in a broad sense seemed to relate to a moral and conative propensity, which he called conscientiousness or purposeful consistency. A few years later, in Spearman's own laboratory, Lankes and Wynn Jones (7) demonstrated the existence of another non-intellective factor, "p," or perseverance, which characterized their subjects' tendency to resist changes in set, and which Spearman related to his law of inertia. In 1921, W. M. Brown (2) discussed character traits as factors in intelligence tests, and in 1933, R. B. Cattell (3) reported correlations between tests of temperament and ratings in intelligence. But perhaps the most crucial findings are those of W. P. Alexander (1) who, in an extensive factor analysis of a large series of verbal and performance tests, supplemented by tests of achievement and academic marks, showed that in addition to the now familiar  $g$ ,  $V$  (verbal ability), and  $P$  (practical ability), a considerable portion of variance had been ascribed to two other extracted factors, namely,  $X$  and  $Z$ .  $X$  was a factor which determined the individual's interests and "concerns," in Alexander's words, "temperament rather than ability"; while  $Z$  was "an aspect of temperament related to achievement," in the case of Alexander's subjects, to school achievement.

The factor loadings of  $X$  and  $Z$  varied greatly from test to test, but even some of Spearman's ostensibly pure tests of  $g$  contained some  $Z$  and nearly all the performance tests showed considerable  $X$  or  $Z$  loadings. As might be expected, these factors played an even greater role in academic or technical achievement. For success in science, for example, the  $X$  factor loading was .74, as against only .36 for  $g$ , and for English .48 as against .43 for the  $g$  loading. From these findings one might even infer that lack of intellectual ability, beyond a certain point, accounts for relatively little of school failures. Indeed Dorothea McCarthy (6) recently offered the "hypothesis," and I quote, "that emotional insecurity . . . is the basic cause of most educational disabilities and learning failures, which are not due to mental defect."

What are we to make of these two findings? First, that factors other than intellectual contribute to achievement in areas where, as in the case of learning, intellectual factors have until recently been considered uniquely determinate, and, second, that these other factors have to do with functions and abilities hitherto considered traits of personality. Among those partially identified so far are factors relating primarily to the conative functions like drive, persistence, will, and perseverance, or in some instances, to aspects of temperament that pertain to interests and achievement. This, to be sure, is just the beginning, but one of the reasons that not much more has been done is that psychologists have continued to assume that personality has little to do with intelligence. To Thurstone as

well as to Spearman, general intelligence seems to be first and foremost a cognitive function, by Spearman to be accounted for by a single pervasive factor, by Thurstone by a number of factors.

It is curious that the clinical psychologist, so little impressed by or, at least, so little conversant with factor analysis, has almost from the start dealt with intelligence test findings as if the personality components in intelligence were already an established fact. For what does psychological diagnosis on the basis of intelligence test findings consist of but inferring adaptive capacities of the subject as a persona? It appears that the clinician, like the character in Moliere's *Malade Imaginaire*, "has been speaking prose all his life without knowing it."

One might add that diagnosing personality and personality disorder, at the level it is being done, is not very difficult. Practically every good individual test of intelligence lends itself to such application to a greater or lesser degree, the Bellevue Scales and the new Children's Test of Intelligence perhaps a little more readily. This does not mean that they are tests of personality, but they do suggest that our intelligence tests contain elements which are essentially factors of the personality as a whole rather than of specific cognitive abilities. When the neurotic does poorly on the Digit Span Test, it is not because of defective memory, but generally because of a basic anxiety mobilized by the test, as by any other situation, in which he is seemingly on trial. Conversely, when a mental defective does relatively well on the Maze Test, it is generally not because he has better planning ability, but because he is less impulsive. Similarly, a large variety of traits and personality factors may be inferred from test performance—for example, energy level from a subject's performance on the Digit Symbol, asocial tendencies from general comprehension, masculinity-femininity from the picture completion test. These are only a few of the traits and diagnostic constellations with which every clinician who has done psychological diagnosis is familiar.

The point here is not that personality traits can be discovered in psychometric performance, or, what needs no special argument, that personality and abnormal conditions influence intelligence test findings, but that personality traits *enter into* the effectiveness of intelligent behavior, and, hence, into any global concept of intelligence itself. It is one thing if a child does poorly on an intelligence test because he is disinterested or upset and quite another if he is congenitally impulsive or emotionally unstable.

One would naturally suppose that if intelligence is a function of the personality as a whole, one should find significant positive or negative correlations with measures of personality itself. Such, indeed, are the findings, but the results are extremely hard to evaluate. This is in part due to the fact that the studies in this area have been done primarily with the intent of discovering the extent to which intelligence accounts for variance



in personality. In an article which appeared in 1940, Irving Lorge reviews the studies published to that date on the general relationship between measures of intelligence and various measures or estimates of personality. The personality tests included most of the current and older inventories (Woodworth, Laird, Thurstone, Bernreuter, Allport, et al.), as well as the association experiment and the personality measures of Harshorn, May, and Maller. Some 200 correlation coefficients were analyzed. The range of coefficients was from  $+ .70$  to  $- .49$  with a median of  $+ .04$ . Disregarding the signs, half of the ratios were between  $.00$  and  $.15$ , and one quarter of them  $.30$  and above. Lorge's general feeling about the findings is that the range is so "extraordinary that anybody can make any statement." Nevertheless, his conclusion is "that some correlation between intelligence and personality exists" (5).

All this is rather meager fare, but the findings are perhaps as satisfactory as could be expected. Apart from the known unreliability of paper-and-pencil inventories, there is the more disturbing fact of their uncertain validity and relevance. At times they do not measure the traits claimed for them, at others they measure only small segments of the personality, although in different ways; and at still other times, traits which are purely nominal. The latter, for example, was shown by Flanagan (4) to be the case with the Bernreuter Inventory dichotomies. In the original publication the test was scored for six different traits, which by factorization were then reduced to two.

Flanagan's study is a good example of how factor analysis aids us in getting at basic components. Mere evidence of concomitant variation is not enough; in fact, it is often misleading. For example, defective hearing may have a measurable effect on both learning arithmetic and size of vocabulary, but, obviously, has no basic relation to either arithmetical reasoning or verbal ability. A variable to be basic and scientifically significant must be independent. In the case of man's cognitive functions, these independent variables, insofar as they are relevant to general intelligence, have been pretty well identified. It may be possible to add one or two to Thurstone's list, but not many more. Those of personality are yet to be discovered. We have some knowledge of what the factors to be measured are likely to be, some on the basis of researches like those of Webb, Alexander, Guilford, Cattell, and Eysenck, others on the basis of general observation and clinical experience. The latter have thus far gone unrecognized, not only because we have no tests for them but because clinicians, like their more academic colleagues, still think of intelligence as consisting primarily of cognitive abilities. Any bit of behavior that seems concerned with or related to instinct, impulse, or temperament is ipso facto considered as having no direct relation to general intelligence.

Such, for example, is curiosity. This was one of the traits which Terman in his studies of genius found most frequently among his gifted chil-

dren. But he did not have, nor do we as yet have, any test of curiosity. No attempt has been made to extract curiosity as a factor of intelligence. We all know how important curiosity is for biologic adaptation as well as scientific achievement. It is, to quote McDougall, "at the basis of many of man's most splendid achievements, for rooted in it are his speculative and scientific tendencies," and "... in men in whom curiosity is innately strong, it may become the main source of intellectual energy and effort." But what is curiosity? "It is the impulse to approach and examine more closely the object which attracts it," that is an instinct, and according to McDougall, one of the basic instincts.

One need not be afraid or ashamed to acknowledge impulse, instinct and temperament as basic factors in general intelligence. It is indeed because I believe they are that I have brought before you the arguments and evidence presented. My main point has been that general intelligence cannot be equated with intellectual ability, but must be regarded as a manifestation of the personality as a whole. I have tried to show that factors other than intellectual enter into our concept of general intelligence, and that in everyday practice, we make use of them knowingly or not.

What is needed is that these factors be rigorously appraised. Factor analysis has been emphasized because, at present, it is the only method which enables us to demonstrate and discover independent variables. We already have some clues as to what the non-intellective but relevant factors of intelligence may be. What we now need are tests which not only identify but measure them. This in effect demands broadening our concept of general intelligence and calls for a revised psychometric to measure these added variables as sub-tests of all general intelligence scales.

To say that general intelligence can be social and practical, as well as abstract, was just a beginning. We had to know what basic components of the mind were responsible for making an individual effective in one rather than in another area.

To realize that general intelligence is the function of the personality as a whole and is determined by emotion and conative factors is also just a beginning. We now need to know what non-intellective factors are relevant and to what degree. This is the task which lies immediately before us.

#### REFERENCES

1. Alexander, W. P. Intelligence, concrete and abstract, *Brit. J. Psychol. Monogr. Suppl.*, 1935, 6, No. 19.
2. Brown, W. M. Character traits as factors in intelligence test performance. *Arch. Psychol.*, 1923.

3. Cattell, R. B. Temperament tests. I. Temperament. *Brit. J. Psychol.*, 1933, 23, 308-29.
4. Flanagan, J. C. Factor analysis in the study of personality. Stanford Univ. Press, 1935.
5. Lorge, I. *Intelligence: its nature and nurture*. 39th Yearbook. National Society for Study of Education, 1940, Part I, 275-81.
6. McCarthy, Dorothea. Personality and learning. *Amer. Coun. educ. Studies*, 1948, Series I, No. 35.
7. Spearman, C. *The abilities of man*. New York: Macmillan, 1927.
8. Webb, E. Character and intelligence. *Brit. J. Psychol. Monogr. Suppl.*, 1915, III.

3

## FREUD AND THE IMAGE OF MAN

JEROME S. BRUNER

*The paper gives an innovative account of Freud's contributions. It is innovative in that the author brings together in warring prose the roots of Freud's genius: (a) the influence of the ancient Greek philosophers and dramatists; (b) the Hebraic traditions of morality, reasoned dispute, and mature sexuality; and (c) the extension of Darwin's work to the idea that primitive impulses exist in parallel with civilized conduct in the human adult.*

By the dawn of the sixth century before Christ, the Greek physicist-philosophers had formulated a bold conception of the physical world as a unitary material phenomenon. The ionics had set forth a conception of matter as fundamental substance, transformation of which accounted for the myriad forms and substances of the physical world. Anaximander was subtle enough to recognize that matter must be viewed as a generalized substance, free of any particular sensuous properties. Air, iron, water, or bone were only elaborated forms, derived from a more general stuff. Since

Reprinted from the *American Psychologist*, 11, 463-466. Copyright © 1956 by the American Psychological Association.

This article also appeared in the July 1956 *Partisan Review* and was read earlier in that year at the Conference on Science and the Modern World View under the auspices of the American Academy of Arts and Science.