Outline of Psychology of Intelligence
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Contents

Note: To look up references, see the Consciousness Bibliography, listing 10,000 books and articles, with full journal and author names, available in text and PDF file formats at http://www.outline-of-knowledge.info/Consciousness_Bibliography/index.html.

SOCI>Psychology>Intelligence

intelligence
People have general abilities {intelligence}| used to adapt to environment. Intelligence is the way that mind processes information.

decision making
Intelligence is ability to do something person never did before. It is making good predictions about what will happen and making good behavior choices. It is grasping essentials in given situation and responding appropriately to them. It detects relations and associations to improve decision making, by formulating hypotheses and finding implications. It includes deductive reasoning and problem solving. It is quickness and efficiency in doing many abilities. It involves flexibility and creativity. It involves responding correctly to stimuli, thinking abstractly, adjusting to environment, adapting to new situations, knowing, unifying complex stimuli, inhibiting instincts, using trial and error, socializing well, learning easily, learning from experience, and solving problems.

properties
Intelligence provides the following abilities. Respond flexibly to situations. Recognize change. Understand ambiguous or contradictory information. Know object and event relative importance. Perceive similarities. Perceive distinctions. Use concepts to synthesize new concept. Imagine well. Create. Recognize patterns or repetitions. Generalize from cases. Have complex world model.

poison
Perhaps, intelligence relates to ability to resist poisons and infections or to make few poisons and toxins in environment.

symbols
Perhaps, intelligence relates to want, need, or motivation for symbols. It is not an aptitude but desire or emotion.

achievement
Above IQ 85, correlation between IQ and achievements {achievement}| is small.

adaptability
People have ability to adjust self and environment {adaptability}| to obtain pleasure and survival.

aptitude
People have ability {aptitude}| in task.

expertise
Experts {expertise}| in subject have large working memory for that subject, gained by active learning with high motivation.

faculty psychology
Mind has inherited, separate powers, such as memory, learning, intelligence, perception, and will {faculty psychology}. They do not come through use, exercise, or study.

gifted children
More intelligent children {gifted children}| are taller, heavier, more socially poised, better in school, more active in play, more developed, and have less headaches and nervous habits. As adults, they have average problems but better jobs and education.

prototype of intelligence
Intelligence can compare with an ideal intelligent human {prototype, intelligent human}. Prototype only explains what people think intelligence is, not what intelligence actually is. Actually, multiple prototypes exist.

SOCI>Psychology>Intelligence>Components

intelligence factor
When solving problems on tests and in life, elementary abilities {intelligence factor} perform operations on contents to produce products. There are more than 100 intelligence factors. Reflexes, learned associations, verbal comprehension, word fluency, number fluency, spatial visualization, perceptual speed, memory, and reasoning are primary factors. Factors include abilities to perform movements, use concepts, handle tools, keep items in mind simultaneously, establish relationships, use imagination, form tactics, and form strategies. Verbal-educational ability and practical-mechanical ability are secondary factors, derived from primary factors.

testing
Intelligence as measured by tests involves verbal ability, spatial ability, numerical ability, reasoning, word fluency, and memory.

learning
Learning and environment affect verbal and spatial abilities. Learning and environment do not affect memory and ability to concentrate much.

metacomponent
People use control processes {metacomponent} to plan how to solve problem, make decisions about alternatives, and monitor progress.

acquisition component
People have processes {acquisition component} to acquire knowledge.

performance component
People have processes {performance component} to solve problems.

retention component
People have processes {retention component} to remember.

transfer component
People have processes {transfer component} to generalize.

SOCI>Psychology>Intelligence>Levels

genius intelligence
People can have IQ greater than 150 {genius, intelligence}|. Genius associates with motivation, expertise, self-confidence, novel thinking, intelligence, effective learning, management, brilliance, creativity, talent, interest, achievement need, self-control, curiosity, stamina, good work habits, and appropriate situation. Genius does not associate with madness.

retardation
People can have low mental age and intelligence quotient {retardation}| {mental retardation}. Subnormal maturation, learning, intelligence, adaptation, and social functioning are like arrested or incomplete mind development. In USA, retarded and handicapped children are ten percent of children. Four people per thousand are slow in social and occupational situations.

classification

Lowest IQ range is 0 to 25 {profound mental retardation}. Next lowest IQ range is 20 to 39 {severe mental retardation}. Middle low IQ range is 36 to 54 {moderate mental retardation}. Higher low IQ range is 52 to 69 {mild mental retardation}. Low IQ range is 68 to 84 {borderline mental retardation}.

causes

Poor nutrition, drugs, rubella, syphilis, age, irradiation, Rh factor incompatibility, low oxygen at birth, and birth injury impair mental development.

differences

If asked to think about their experiences, low-IQ and high-IQ children differ less than expected.

idiot

Lowest retardation class {idiot}| has mental age less than two years or IQ below 26.

imbecile

Next lowest range {imbecile}| is IQ 31 to 50.

moron

Low range {moron}| is IQ 51 to 70.

subaverage

IQ 71 to 84 is borderline retardation {subaverage}.

subnormal intelligence

One person per thousand is more than one standard deviation below average intelligence score {subnormal intelligence}. Subnormality associates with aggressive and irresponsible conduct and neurotic and psychotic disorders.

SOCI>Psychology>Intelligence>Single Factor

calculating genius

Ability to calculate rapidly {calculating genius} depends on knowing numerical facts and short-cut methods. It does not develop by prolonged, cumulative experience. It atrophies with disuse. Calculating geniuses generate answers right-to-left, in same way as if using paper-and-pencil procedure.

idiot savant

Developmentally disabled people can have special right-brain talents {idiot savant}|, such as music, painting, or procedural memory. Idiot savant typically has left-hemisphere damage.

SOCI>Psychology>Intelligence>Tests

intelligence test

Intelligence tests {intelligence test} are good predictors of academic or vocational success. Intelligence tests assess cognitive, spatial, and/or quantitative ability. They do not measure motivation, social skill, persistence, or goals. They measure cognitive skills, deductive reasoning, verbal reasoning, numerical reasoning, or perceptual reasoning. They can emphasize speed or accuracy. They can emphasize abstract or practical situations. They use only some intelligent activities. They cannot measure intelligence itself.

test-taking ability

Test-taking ability {test-taking ability} depends on two factors: question-answering speed and number of concepts that mind can hold simultaneously.

test-taking ability: anxiety

Anxiety can cause people to be unable to take tests.

test-taking ability: learning

Test-maker experiences affect tests, and these experiences are not the same as test-taker experiences, so acquired knowledge affects test.

questions

Intelligence test must use problems that have all information required to solve the problem. Solutions must be unambiguous, with only one close to true.

types

Tests include Stanford-Binet, Weschler Adult Intelligence Scale (WAIS), and Weschler Intelligence Scale for Children (WISC).

infants

Infant sense and motor tests show little relation to later intelligence tests.

simple test

What is the simplest intelligence or understanding test? Given examples, intelligent entities can find a rule. Alternatively, given a rule, intelligent entities can give examples. Rules take input states to output states. Intelligence involves using the rule in reverse: to get output state by setting input state.

The simplest input is constant value. The simplest output is constant value. The simplest rule is "stays the same". Rule to test intelligence must have change. What is simplest rule possible? Perhaps, one rule is not sufficient. What are fewest simple rules? What are the fewest inputs and outputs for one rule?

The simplest rule can have one input that can be in either of two states and one output that can be in either of two states. It has four states. If input is ON and output is ON, input stays ON and output stays ON. If input is ON and output is OFF, input stays ON and output stays OFF. If input is OFF and output is ON, input becomes ON and output stays ON. If input is OFF and output is OFF, input stays OFF and output stays OFF.

Only third rule has change, so there is only one change.

Machines or people observe the four examples once each and can then articulate the four rules. However, can people or machines set input and output to keep both OFF or both ON? This simple way can test understanding.

intelligence quotient

Calendar age times 100 divides into mental age {intelligence quotient}| (I.Q.) (IQ).

mental age

Physical ages have average general intelligence test score {mental age}|. Mental abilities can compare to average for age level.

SOCI>Psychology>History>Intelligence

Alfred Binet [Binet, Alfred]

psychologist
Paris, France
1903
Experimental Study of Intelligence [1903]; Development of Intelligence in Children [1916: with Theodore Simon]
He lived 1857 to 1911 and developed Binet intelligence scale and intelligence quotient.

Edward Lee Thorndike [Thorndike, Edward Lee]

psychologist
USA
1903 to 1911
Educational Psychology [1903]; Animal Intelligence [1911]
He lived 1874 to 1949 and studied learning, education, testing, and animal intelligence. He studied instrumental learning, law of effect, law of exercise, law of readiness, operant conditioning, puzzle-box, reinforcement, and learning transfer [Thorndike, 1911]. Imitation is seeing action, remembering it, and then doing it.

Theodore Simon [Simon, Theodore]

psychologist
France
1905 to 1916
Development of Intelligence in Children [1916: with Binet]
He lived 1872 to 1961 and invented intelligence test [1905], Binet-Simon Scale, with Binet.

Lewis Madison Terman [Terman, Lewis Madison]

psychologist
USA
1916
Measurement of Intelligence [1916]

He lived 1877 to 1956, invented Stanford-Binet test and Terman group intelligence tests, and studied gifted children.

Ernst Kretschmer [Kretschmer, Ernst]
psychiatrist
Germany
1921 to 1929
Physique and Character [1921]; Psychology of Men of Genius [1929]
He lived 1888 to 1964 and studied intelligence.

Louis Leon Thurstone [Thurstone, Louis Leon]
psychologist
USA
1924 to 1959
Nature of Intelligence [1924]; Vectors of the Mind [1935]; Multiple-Factor Analysis [1947]; Measurement of Values [1959]
He lived 1887 to 1955. He worked on psychometrics, army recruiting tests, mental qualities, attitude scales, learning curves, mental development units, intelligence tests, multiple factor analyses, and psychoneurotic tendencies.

Cyril Lodowic Burt [Burt, Cyril Lodowic]
psychologist
Britain
1925 to 1940
Young Delinquent [1925]; Backward Child [1937]; Factors of the Mind [1940]
He lived 1883 to 1971. He studied individual ability and character differences and how heredity determined differences. He developed statistical methods to quantify what differed among people {factor analysis, Burt}. He invented a verbal reasoning test.

David Wechsler [Wechsler, David]
psychologist
USA
1935 to 1939
Range of Human Capacities [1935]; Measurement of Adult Intelligence [1939]; Measurement and Appraisal of Adult Intelligence [1958]
He lived 1896 to 1981, studied verbal and performance intelligence {Wechsler Bellevue Scale} [1939], and invented WAIS test [1955].

Joy Paul Guilford [Guilford, Joy Paul]
psychologist
USA
1950 to 1982
Nature of Human Intelligence [1967]; Cognitive psychology's ambiguities: Some suggested remedies [1982]
He lived 1897 to 1967 and studied intellectual structure {Structure of Intellect}.

Jacob Getzels [Getzels, Jacob]
psychologist
USA
1962 to 1976
Creativity and Intelligence [1962]; Creative Vision [1976: with M. Csikszentmihalyi]
He lived 1912 to 2001 and studied creativity and intelligence.

Howard Gardner [Gardner, Howard]
psychologist
USA
1975 to 1983
Shattered Mind [1975]; Frames of Mind [1983]
He lived 1943 to ?. Intelligence is problem-solving ability.

David Premack [Premack, David]
psychologist
USA
1976 to 1986
Intelligence in Ape and Man [1976]; Gavagai! or Rabbit! [1986]
He lived 1925 to ? and studied ape intelligence and natural language.

Horace F. Judson [Judson, Horace F.]
psychologist
USA
1980
Search for Solutions [1980]
He studied problem-solving.