Cheat Sheet: Thinking and Intelligence

Essential Concepts

Thinking and Problem Solving

- Cognitive psychology is the study of cognition, or the brain's ability to think, perceive, plan, analyze, and remember.
- Concepts and their corresponding prototypes help us quickly organize our thinking by creating categories into which we can sort new information.
- We also develop schemata, which are clusters of related concepts. Some schemata involve routines of thought and behavior, and these help us function properly in various situations without having to "think twice" about them. Schemata show up in social situations and routines of daily behavior.
- Many different strategies exist for solving problems. Typical strategies include trial and error, applying algorithms, and using heuristics. To solve a large, complicated problem, it often helps to break the problem into smaller steps that can be accomplished individually, leading to an overall solution.

Pitfalls to Problem-Solving

- Roadblocks to problem-solving include a mental set, functional fixedness, and various biases that can cloud decision-making skills.
- Choice blindness refers to the phenomenon where individuals fail to recall or notice their own choices immediately after making them, challenging the assumption that we always have a clear awareness of our decisions, as shown by research exploring the reasons behind this occurrence.

Intelligence and Creativity

- Many theories have been developed to explain what intelligence is and how it works. Sternberg generated his triarchic theory of intelligence, whereas Gardner posits that

intelligence is comprised of many factors. Still, others focus on the importance of emotional intelligence.

- Creativity seems to be a facet of intelligence, but it is extremely difficult to measure objectively.
- Intelligence tests began in earnest with Binet; Wechsler later developed intelligence tests that are still in use today: the WAIS-IV and WISC-V.
- The Bell curve shows the range of scores that encompass average intelligence as well as standard deviations.

The Source of Intelligence

- Genetics and environment affect intelligence and the challenges of certain learning disabilities. The intelligence levels of all individuals seem to benefit from rich stimulation in their early environments. Highly intelligent individuals, however, may have a built-in resiliency that allows them to overcome difficult obstacles in their upbringing.
- Learning disabilities can cause major challenges for children who are learning to read and write. Unlike developmental disabilities, learning disabilities are strictly neurological in nature and are not related to intelligence levels. Students with dyslexia, for example, may have extreme difficulty learning to read, but their intelligence levels are typically average or above average.

Language

- Language is a communication system that has both a lexicon and a system of grammar.
- Language acquisition occurs naturally and effortlessly during the early stages of life, and this acquisition occurs in a predictable sequence for individuals around the world.
- Language has a strong influence on thought, and the concept of how language may influence cognition remains an area of study and debate in psychology.

Glossary

algorithm

problem-solving strategy characterized by a specific set of instructions

analytical intelligence

aligned with academic problem solving and computations

anchoring bias

faulty heuristic in which you fixate on a single aspect of a problem to find a solution

artificial concept

concept that is defined by a very specific set of characteristics

audience design

constructing utterances to suit the audience's knowledge

availability heuristic

faulty heuristic in which you make a decision based on information readily available to you

choice blindness

the failure to recall a choice immediately after we have made that choice

cognition

thinking, including perception, learning, problem solving, judgment, and memory

cognitive psychology

field of psychology dedicated to studying every aspect of how people think

common ground

information that is shared by people who engage in a conversation

concept

category or grouping of linguistic information, objects, ideas, or life experiences

confirmation bias

faulty heuristic in which you focus on information that confirms your beliefs

convergent thinking

the opposite of divergent thinking, the capacity to narrow in on the single "correct" answer or solution to a given question or problem (e.g., giving the right response on an intelligence tests)

creative intelligence

ability to produce new products, ideas, or inventing a new, novel solution to a problem

creativity

ability to generate, create, or discover new ideas, solutions, and possibilities

crystallized intelligence

characterized by acquired knowledge and the ability to retrieve it

cultural intelligence

ability with which people can understand and relate to those in another culture

divergent thinking

the opposite of convergent thinking, the capacity for exploring multiple potential answers or solutions to a given question or problem (e.g., coming up with many different uses for a common object)

dyscalculia

learning disability that causes difficulty in learning or comprehending arithmetic

dysgraphia

learning disability that causes extreme difficulty in writing legibly

dyslexia

common learning disability in which letters are not processed properly by the brain

emotional intelligence

ability to understand emotions and motivations in yourself and others

event schema

set of behaviors that are performed the same way each time; also referred to as a cognitive script

fluid intelligence

ability to see complex relationships and solve problems

Flynn effect

observation that each generation has a significantly higher IQ than the previous generation

functional fixedness

inability to see an object as useful for any other use other than the one for which it was intended

grammar

set of rules that are used to convey meaning through the use of a lexicon

heuristic

mental shortcut that saves time when solving a problem

hindsight bias

belief that the event just experienced was predictable, even though it really wasn't

ingroup

group to which a person belongs

intelligence quotient (IQ)

score on a test designed to measure intelligence

language

communication system that involves using words to transmit information from one individual to another

learning disabilities

cognitive disorders that affect different areas of cognition, particularly language or reading

lexicon

the words of a given language

linguistic intergroup bias

a tendency for people to characterize positive things about their ingroup using more abstract expressions, but negative things about their outgroups using more abstract expressions

mental set

continually using an old solution to a problem without results

morpheme

smallest unit of language that conveys some type of meaning

Multiple Intelligences Theory

Gardner's theory that each person possesses at least eight types of intelligence

natural concept

mental groupings that are created "naturally" through your experiences

norming

administering a test to a large population so data can be collected to reference the normal scores for a population and its groups

outgroup

group to which a person does not belong

overgeneralization

extension of a rule that exists in a given language to an exception to the rule

phoneme

basic sound unit of a given language

practical intelligence

aka "street smarts"

priming

when thinking about one concept reminds you about other related concepts

problem-solving strategy

method for solving problems

prototype

best representation of a concept

range of reaction

each person's response to the environment is unique based on their genetic make-up

representative sample

subset of the population that accurately represents the general population

representative bias

faulty heuristic in which you stereotype someone or something without a valid basis for your judgment

role schema

set of expectations that define the behaviors of a person occupying a particular role

Sapir-Whorf hypothesis

the hypothesis that the language that people use determines their thoughts

schema (plural = schemata)

mental construct consisting of a cluster or collection of related concepts

semantics

process by which we derive meaning from morphemes and words

situation models

representations of the topic of a conversation

social brain hypothesis

the hypothesis that the human brain has evolved so that humans can maintain larger ingroups

social networks

networks of social relationships among individuals through which information can travel

standard deviation

measure of variability that describes the difference between a set of scores and their mean

standardization

method of testing in which administration, scoring, and interpretation of results are consistent

syntax

rules by which words are strung together to form sentences

theory of cognitive abilities

abilities are related and arranged in a hierarchy with general abilities at the top, broad abilities in the middle, and narrow (specific) abilities at the bottom—narrow abilities are the only ones that can be directly measured; however, they are integrated within the other abilities

trial and error

problem-solving strategy in which multiple solutions are attempted until the correct one is found

triarchic theory of intelligence

Sternberg's theory of intelligence; three facets of intelligence: practical, creative, and analytical

working backwards

heuristic in which you begin to solve a problem by focusing on the end result