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Journal of Psychology & Psychotherapy

Perspective

An Overview of Cognitive Psychology

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DESCRIPTION

Cognitive psychology is the scientific research of human knowledge, that is, the perception, learning, remembering, thinking, reasoning and understanding of all our mental abilities. The word "cognition" comes from the latin word "cognoser" or "knowing". Basically, cognitive psychology is the study of how individuals acquire and apply knowledge or information. It is closely related to interdisciplinary cognitive science and is influenced by artificial intelligence, computer science, philosophy, anthropology, linguistics, biology, physics and neuroscience. Cognitive psychology has new technologies in psychology in its modern form. Cognitive psychology is based on two hypotheses: The human knowledge can be fully revealed in a scientific way, at least in principle, that is, individual parts of mental processes can be identified and understood, and internal psychological processes can be explained, In terms of rules or algorithms in information processing models. There has been a lot of discussion recently on these estimates.

New approaches such as physics, experiments and simulations/modeling are major research tools in cognitive psychology. Often, sample estimates are directly compared to human behavior. With ease of access and widespread use of brain imaging techniques, cognitive psychology has been increasing the impact of cognitive neuroscience over the past decade. There are currently three major approaches to cognitive psychology-experimental cognitive psychology, computational cognitive psychology, and neural cognitive psychology.

Experimental cognitive psychology considers cognitive psychology to be one of the natural sciences and applies experimental methods to research human cognition. In experimental cognitive psychology, psychophysical responses, response time, and eye tracking are frequently measured. Computational cognitive psychology develops formal mathematical and computational models of human knowledge based on symbolic and sub-symbolic representations and dynamic systems. Neural cognitive psychology uses brain imaging (e.g., EEG, MEG, fMRI, PET, SPECT, optical imaging) and neurobiological methods (e.g., lesion patients) to understand the neural basis of human cognition. The three approaches are often interconnected and provide independent and complementary insights into each sub-domain of cognitive psychology.

Traditionally, cognitive psychology has included human comprehension, attention, learning, memory, conceptualization, reasoning, judgment and decision making, problem solving and language processing. For some, social and cultural factors, emotion, consciousness, animal cognition, and even evolutionary processes have become part of cognitive psychology.

Perception

The awareness seekers try to understand how to construct subjective interpretations of intimate information from the environment. Perception systems are specialized senses (e.g., visual, auditory, somatosensory) and processing modules and sub-modules that represent different aspects of stimulus information. Current researchs also focuses on how these particular representations and modules interact and coexist with coherent insights. Cognitive psychologists have studied these features empirically with psychophysical methods and brain imaging. Computational models have been developed based on physical principles for many perceptual systems.

Attention

Attention solves the problem of data overload in cognitive processing systems by selecting certain information for subsequent processing or managing resources that apply to multiple data bases simultaneously. Empirical research of attention focuses on how and why attention improves performance or how lack of attention hinders performance. Theoretical analysis of attention has taken several major approaches to identify the mechanisms of attention: The signal-detection approach and the similarity-selection approach. Related effects of partial competition have been studied in single cell recording in animals. Brain imaging studies documented the effects of attention on activation in early visual cortices and researched networks for attention control.

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Received: 16-Feb-2022, Manuscript No. JPPT-22-16630; **Editor assigned:** 18-Feb-2022, PreQC No. JPPT-22-16630 (PQ); **Reviewed:** 04-Mar-2022, QC No. JPPT-22-16630; **Revised:** 10-Mar-2022, Manuscript No. JPPT-22-16630 (R); **Published:** 17-Mar-2022, DOI: 10.35248/2161-0487-22.S6.002.

Citation: Kammoun A (2022) An Overview of Cognitive Psychology. J Psychol Psychother. S6:002.

Learning

Learning improves an organism's response to the environment. Cognitive psychologists study what new information is obtained and under what circumstances it is obtained. The study of learning begins with the analysis of learning phenomena in animals (i.e., habit, conditioning, and practice, contingency and associated learning) and extends to the learning of cognitive or conceptual information by humans. Cognitive studies of latent learning emphasize the automatic effect of prior experience on performance and the nature of procedural knowledge. Studies of conceptual practice emphasize the processing nature of incoming information, the role of expansion, and the nature of encoded representation. They explored the nature of concepts and rules and algorithms for learning systems that could be more easily learned by those who use computational methods. Those who use lesion and imaging studies examine the role of specific brain systems (e.g., temporal lobe systems) for episodic learning in certain classes, and the role of perceptual systems in latent learning.

Memory

The study of the strengths and weaknesses of human memory is one of the most advanced aspects of cognitive psychology. Memory study focuses on how to retrieve, store, and retrieve memories. Memory domains are functionally subdivided into facts, policies or skills and memory for work and short-term memory capacity. Experimental approaches have identified limited processing systems such as dissociable memory types or short-term or working memory. Computational methods describe memory as proposed networks or as holographic or composite representations and retrieval processes. Brain imaging and lesion studies identify detachable brain areas that are active during storage or retrieval from different processing systems.

Concept Formation

Concept or category formation refers to the ability to functionally manage the perception and categorization of experiences through the structure of relevant categories. The response to a particular stimulus (i.e., the cat) is determined by the classification of the category and the association of knowledge with that category rather than by specific example. The ability to learn concepts depends on the complexity of the category in the representation space and the relationship of variations between examples of concepts to the basic and accessible dimensions of the representation. Some concepts mostly reflect similarity structures, while others may reflect function or utility theories. Computational models have been developed through example representations, similar structures and general identification models and conceptual theories. Cognitive neuroscience identifies important brain structures for elements or different forms of class structure.

CONCLUSION

Cognitive psychology research has developed extensive principles, representations, and algorithms. Successful applications range from custom-built expert systems to mass-produced software and consumer electronics.

- The development of computer interfaces that collaborate with customers to meet their information needs and act as intelligent agents.
- Development of flexible information infrastructure based on cognitive representation and logical methods.
- Development of smart tools in the financial industry.
- Development of mobile, intelligent robots capable of performing tasks specifically for humans.
- Development of bionic components of the perceptual and cognitive nervous system such as cochlear and retinal implants.