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Article

Psychological Analysis of the Relationship Between Intelligence and Adaptation

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Abstract: This article analyzes the theoretical essence of the concept of intelligence and its relationship with the process of adaptation from a psychological perspective. Intelligence is considered as a complex cognitive system that develops through the interaction between an individual and the surrounding environment. Particular attention is given to the mechanisms of adaptation, namely assimilation and accommodation, which explain the stages of mental development. The study also highlights the role of cognitive processes such as perception, memory, skills, and logical operations in the development of intelligence. It is argued that the development of intelligence is closely related to the increasing complexity of interactions between the subject and the object, as well as to the formation of mobile and reversible mental structures. The results of the study allow intelligence to be interpreted as the highest level of psychological adaptation and reveal its significance in cognitive activity and personality development.

Keywords: Intelligence, Adaptation, Assimilation, Accommodation, Cognitive Development, Mental Structures, Perception, Logical Operations, Psychological Adaptation, Thinking Development.

1. Introduction

If intelligence is considered as a form of adaptation, it is first necessary to clarify the content of the concept of adaptation. In order to avoid terminological complexities, adaptation can be interpreted as a process that ensures a balance between the organism's influence on the environment and the reciprocal influence of the environment on the organism [1].

The active influence of the organism on surrounding objects is called assimilation. This process is understood in a broad sense and is based on the organism's previous experience and behavioral patterns. In other words, a living being does not merely passively adapt to the environment, but actively transforms it and imposes its own specific structure upon it [2].

From a physiological perspective, this process refers to the organism's intake of substances from the environment and their transformation in accordance with its internal structure. From a psychological perspective, a similar process occurs; however, in this case, not material changes but functional transformations take place. These changes are related to motor activity, perceptual processes, and the interaction of real or potential actions [3].

Literature Review

From this point of view, psychological assimilation is characterized by the incorporation of objects into existing behavioral schemas. These schemas consist of systems of actions capable of actively reproducing themselves.

However, the relationship between the organism and the environment is not unidirectional. The environment also exerts a reverse influence on the organism. In biological terminology, this process is called accommodation. Accommodation refers to the organism's modification of its activity in response to environmental influences and its adjustment to new conditions [4]. In psychology, a similar process is observed: the influence of external objects on the psyche is not passively received but is manifested through changes in existing forms of activity. Therefore, adaptation can be defined as a balance between assimilation and accommodation, that is, as a state of equilibrium in the interaction between subject and object [5].

In the case of organic adaptation, these interactions are material in nature and imply direct contact between a specific part of the organism and a specific part of the external environment. Psychic life, however, begins with the emergence of functional interactions. At this stage, assimilation no longer transforms objects in a physico-chemical sense but incorporates them into forms of activity, while accommodation influences the transformation of these activity forms [6].

As a result, direct interactions between organism and environment are replaced by mediated interactions between subject and object. These interactions expand progressively in space and time and manifest themselves in increasingly complex forms [7].

2. Materials and Methods

The development of psychic activity-from perception, skills, and memory to complex logical operations and formal thinking-is directly connected with the expansion of the scope of these interactions. At the same time, this process is determined by the balance between the organism's assimilation of increasingly distant reality and its adaptation to it.

In this sense, intelligence, that is, the system of logical operations, ensures a stable yet dynamic balance between thinking and reality and appears as the highest stage of adaptation processes. Organic adaptation, in contrast, ensures only a limited equilibrium within specific temporal and spatial boundaries.

Basic cognitive functions such as perception, skills, and memory expand this equilibrium further. Perception enables the grasp of distant objects, while memory allows the reconstruction of the past and the anticipation of the future. However, only intelligence strives for a general equilibrium through thinking and action, enabling a broader assimilation of reality and freeing action from the constraints of the initial "here" and "now."

To define intelligence, it is first necessary to determine which level of complex interactions can be considered "intellectual." However, establishing the lower boundary of complexity always remains conditional.

For instance, E. Claparède and W. Stern interpreted intelligence as psychological adaptation to new conditions. Claparède distinguished intelligence from instinct and habit, as the latter represent forms of adaptation to repetitive conditions. In his view, intelligence begins with simple empirical searching and later leads to hypothesis formation.

K. Bühler, however, considered this definition too broad. According to him, intelligence is solely the phenomenon of sudden insight.

3. Results

A similar approach was adopted by W. Köhler, who associated intelligence with a sudden restructuring of a situation and excluded simple trial-and-error activity from this concept. Nevertheless, empirical observations show that search processes emerge alongside the formation of even the simplest habits. Elements such as posing questions, generating hypotheses, and testing them are also present in needs-driven and trial-and-error processes [8].

Therefore, two approaches can be identified in defining intelligence:

- Using a functional definition that includes almost all cognitive structures within intelligence;
- Or selecting a single specific cognitive structure as a criterion.

However, the second approach risks ignoring the natural continuity of cognitive development.

Thus, it is more appropriate to define intelligence through its developmental trajectory. In this case, boundaries are not strictly fixed but are described through different levels of equilibrium [9].

From a functional perspective, behavior is considered more intellectual the more complex and diverse the ways in which the subject interacts with objects.

From a structural perspective, the simplest sensorimotor adaptations are rigid and uniform, whereas intelligence is characterized by the development of reversible and dynamic psychic structures. As in physics, reversibility is the primary criterion of equilibrium [10], [11].

4. Discussion

Therefore, intelligence can be defined as the progressive development of the reversibility of dynamic psychic structures. In other words, intelligence is the state of equilibrium toward which systems of sensorimotor and cognitive adaptations tend [12].

Perception is characterized by the acquisition of knowledge about objects or their movements through direct interaction. In this case, the relationship between subject and object is formed through immediate experience. Intelligence, in contrast, represents a more complex form of cognition arising in the process of interaction between subject and object [13]. Particularly important in this process is the expansion of spatial and temporal distances between subject and object, as well as the emergence of mediated relationships through various cognitive processes.

From this perspective, it can be hypothesized that intellectual structures-especially the operational “groupings” that emerge at higher stages of intellectual development-may initially exist as certain organized structures common to both perception and thinking. This approach is consistent with one of the central ideas of Gestalt theory [14].

Although representatives of Gestalt theory did not fully account for the concept of reversible operational groupings, they thoroughly analyzed the structural organization of wholeness in psychic processes. According to this theory, similar structural laws govern perception, action, elementary psychic functions, and thinking. These laws are also manifested in logical reasoning processes, including syllogistic conclusions (Wertheimer) [15].

5. Conclusion

The above analysis demonstrates that intelligence and thinking processes constitute a complex cognitive system formed through human interaction with the environment. Perceptual processes represent the initial and fundamental stage of this system. Through perceptual structures, individuals acquire primary knowledge about the external world and form representations of objects, phenomena, and their relationships. Therefore,

perceptual processes create the cognitive foundation necessary for subsequent stages of thinking development.

From a scientific standpoint, the formation of thinking processes begins with perception and gradually becomes more complex. Initially, through perceptual structures, the properties of objects and their interrelations are perceived; later, this perceptual experience transforms into generalized knowledge, logical operations, and conceptual systems. Through this process, operational groupings-that is, the logical and structural systems of thinking-are formed.

Thus, in explaining intelligence, it is insufficient to study perception and thinking separately. Rather, they should be considered as interrelated stages of a unified cognitive system. By analyzing perceptual structures, it becomes possible to scientifically explain the mechanisms underlying the emergence of thinking, its developmental patterns, and the formation of logical operations.

Consequently, the development of intelligence arises from the integration of perception, motor activity, and cognitive processes. This process is characterized by the increasing complexity of interactions between subject and object, as well as by the formation of psychic structures as reversible and dynamic systems. In this sense, the study of perceptual structures represents an important methodological direction for identifying the theoretical foundations of intelligence and thinking and for explaining their developmental mechanisms.

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