BASIC COGNITIVE PROCESSES

Traditionally, it is customary to single out two groups of mental processes.

1. Specific, or actually cognitive, processes, which are sensations, perceptions and thoughts. The result of these processes is the knowledge of the subject about the world and about himself, obtained either through sense organs, or rationally:

- sensation - is the selection of the properties of an object;

- perception - is the perception of an object as a whole, as well as perception - the perception of an image, objects;

- thinking - is a reflection of the relationship between objects, their essential properties for cognition.

2. Non-specific, i.e., universal, mental processes - memory, attention and imagination. These processes provide any activity. Universal mental processes are necessary conditions for cognition, but are not reduced to it. Thanks to the universal mental processes, the cognizing, developing subject has the ability to maintain the unity of one's Self in time:

- memory allows a person to retain past experience;

- attention helps to extract actual (real) experience;

- The imagination predicts future experience.

SENSATIONS

Sensations are defined as a process of reflection of individual properties of objects and phenomena of the objective world with their direct impact on the receptors. The physiological basis of sensation is a nervous process that occurs when a stimulus acts on an analyzer adequate to it. Feelings also reflect the state of the body of the subject himself with the help of receptors located in his body. The need to constantly receive sensations is well manifested in the absence of external stimuli (with sensory isolation). As experiments have shown, in this case the psyche ceases to function normally: hallucinations occur, thinking is disturbed, a pathology of perception of one's body is noted, etc. Specific psychological problems arise during sensory deprivation, i.e. with an influx of external influences, it is limited, which is well known from the example of the development of the psyche of people who are blind or deaf, as well as those who see and hear poorly.

Properties of sensations

Modality - is a qualitative characteristic, in which the specificity of sensation as the simplest mental signal is manifested. Each type of sensation has its own modal characteristics. For visual sensations, this is hue, saturation; for auditory - pitch, timbre, loudness; for tactile - hardness, roughness, etc.

Localization - spatial characteristics of sensations, i.e., information about the location of the stimulus in space.

Intensity - is a quantitative characteristic. The problem of measuring the intensity of sensation is one of the main problems in psychophysics. The basic psychophysical law reflects the relationship between the influence of sensation and the influence of the acting stimulus. The area of ​​irritation causes sensation.

Duration - temporal characteristic of sensation. It is determined by the duration of the stimulus and its intensity. The sensation occurs later than the stimulus begins to act, and does not disappear immediately with its termination. The period from the beginning of the action of the stimulus to the appearance of sensation is called the latent (hidden) period of sensation. It is not the same for different types of sensations (for tactile - 130 ms, for pain - 370 ms, for taste - 50 ms) and can change dramatically in diseases of the nervous system.

After the action of the stimulus ceases, its trace remains for some time in the form sequential image, which can be either positive (corresponding to the characteristics of the stimulus) or negative (the most comparable phenomenon is “ringing in the ears”, i.e. an unpleasant sensation that often accompanies exposure to deafening sounds, dark spots in the eyes when looking at the sun or blinded by headlights ).

Types of sensations

Kinesthetic sensations - it is a collection of sensory information coming from the muscles, tendons and ligaments (goosebumps, cramps, etc.)

Vestibular sensations - one of the main functions of the vestibular sensation is to provide a stable basis for visual observation. Thanks to this function, a fairly stable picture of the world appears before us, despite the fact that we ourselves are in motion.

Skin sensitivity provides the individual with information about what is in contact with his body. The palms, fingertips, lips, and tongue are most sensitive. Modern researchers distinguish four types of skin sensitivity: sensations of heat, cold, pressure and pain. Pain sensitivity, for example, has a very important biological significance: pain sensations signal a possible physical danger. A person who does not have such sensitivity, which is rare enough, is constantly in danger.

Taste sensitivity provides the individual with information as to whether a substance can be ingested. The main taste qualities are sourness, salinity, sweetness and bitterness.

Smell provides the individual with information about the presence of various chemicals in the air. In animals, the sense of smell plays a significant role, in humans it is less so. Research shows that dogs are more than a thousand times more sensitive than humans.

Auditory. With the help of hearing, an individual receives information transmitted by means of wave vibrations of the environment about the behavior of objects distant from him (an approaching tram, train) - therefore, you need to take your headphones out of your ears in time.

Visual. Vision is the main source of information for a person. The most interesting problem is the problem of color vision.

Measurement of sensations

The ability of analyzers to reflect individual properties of stimuli or subtle differences between them characterize the thresholds of sensations.

Lower absolute threshold

Lower absolute threshold - this is the smallest amount of stimulus that causes a barely perceptible sensation.

Upper absolute threshold

Upper absolute threshold - the maximum value of the stimulus at which the sensation disappears (the person loses consciousness) or changes qualitatively (for example, it turns into pain).

Sensory adaptation - this is a change in the thresholds of sensations under the action of a constant stimulus. With full adaptation, there is no sensation at all.

Synesthesia - another manifestation of the interaction of analyzers. The phenomenon of synesthesia is the appearance under the influence of irritation of one analyzer of a sensation characteristic of another analyzer. The most common visual-auditory synesthesia, when, under the influence of sound stimuli, the subject has visual images. Thus, some composers (N. A. Rimsky-Korsakov, A. N. Skryabin) had the ability to hear in color. Less common are cases of auditory sensations when exposed to visual stimuli, and taste sensations in response to auditory stimuli. The phenomenon of synesthesia is evidence of the constant interconnection of the analyzer systems of the human body.

Perception

Perception - it is a reflection of integral objects and phenomena with their direct impact on the senses. In the course of perception, there is an ordering and unification of individual sensations into integral images of things. Unlike sensations, which reflect the individual properties of the stimulus, perception reflects the object as a whole, in the aggregate of its properties.

Perception of space and movement

One of the main problems of perception is the problem of localization - determining the location of objects. The following features of perception are distinguished: perception of depth and distance of objects, perception of movement, perception of shape.

Perception of depth and distance of objects. One of the main questions of perception of the depth and distance of objects is why and due to what we see the world in three dimensions, if we have only a two-dimensional (flat) image of it on the retina.

Perception of movement. The phenomenon of motion perception is that an object can be perceived as moving even if its image does not move across the retina. For example, two light bulbs are located at some distance from each other. The first lights up for a short time and goes out, then the second lights up and also goes out, etc. If the time interval between the ignition of the bulbs is from 30 to 200 milliseconds, then it seems to us that the light strip moves from one point to another. This phenomenon is called the stroboscopic effect and has long been used in animation and illuminated advertising.

Form perception. Shape is crucial in the process of identifying any item. Images of perception are characterized by integrity. This means that they present some coherent picture, an image of an object or event. We do not perceive the tree outside the window as a collection of green oval objects against a background of black thick vertical lines and thin black lines, most of which are at some angle.

THINKING AND SPEECH

Thinking - is a process of cognitive activity of an individual, inextricably linked with speech, characterized by a generalized and mediated reflection of reality in the course of its analysis and synthesis. Thinking arises on the basis of practical activity from sensory cognition. Unlike perception and sensation, which receive knowledge about the world through the senses, thinking is a rational form of cognition of reality.

Thinking is a central component of cognitive activity. If we are dealing with normal typical thinking, then it must be developed and improved.

Thinking in cognitive activity is preceded by sensations and perceptions (sensory cognition). Thinking cannot be imagined without the source material contained in sensory experience.

Why does a person need thinking? Causal-and-investigative dependencies that do not lie on the surface, inaccessible to the sensual. In thinking, a transition is made to the indirect determination of these properties.

Individual features of thinking criticality, depth, flexibility and quickness of thought can be attributed. The degree of critical thinking is different for different people and depends on many factors.

Considering the problem of thinking, it is impossible not to touch on the question of the relationship between thinking and intelligence. The intellect cannot be reduced only to the thought process, despite the fact that thinking is its most important component.

Intelligence - is a set, integrity of cognitive processes, providing complex adaptive activity to the conditions of social reality.

Thinking - is a process of generalized and mediated cognition, consisting in the discovery of relations between objects and phenomena and their transformation.

Thinking can be carried out with the help of rational and sensual forms.

With the help of thinking, a person cognizes such phenomena of the external world that are not directly given in perception: they cannot be seen - one can only think about them. For example, physicists study the properties of elementary particles that cannot be seen even with a microscope.

STAGES OF DEVELOPMENT OF THINKING

Visual-active thinking (or "sensory-motor intelligence", according to the classification of J. Piaget). This is the earliest and simplest type of thinking in a child, because. a visual-effective solution of the problem is carried out with the help of a real physical transformation of the situation. The child analyzes and synthesizes objects as he practically separates and reassembles, correlates, connects certain objects with each other with his hands. Curious children often break toys in order to see "what's inside."

Visual-figurative thinking. Visual-figurative thinking occurs at the age of four to seven years. This type of thinking is associated with the presentation of the situation and changes in the image, in which the vision of an object from several points of view can be fixed simultaneously. Instead of operating with objects, the child begins to operate with their images and mentally perform operations that are not feasible in reality.

Verbal-logical thinking. The further way of development of thinking lies in its transition to the symbolic plane, associated with the operation of symbols, primarily words. Thinking refuses to operate with objects as a whole and proceeds to the mental operation of properties that are relevant in each given case. Verbal-logical thinking is characterized by the use of concepts, logical constructions, functions on the basis of linguistic means, and various types of generalizations are formed and function in its structure.

Until recently, it was believed that only man possesses symbolic intelligence. Attempts to teach higher animals to human speech have not been successful. However, in the 1980s American spouses Gardner managed to teach chimpanzees the language of the deaf and dumb. It turned out that the difficulties of previous attempts were associated not so much with the intellectual capabilities of animals, but with the limitations of their articulatory apparatus or phonemic hearing (for example, a child must first develop a speech apparatus - learn to chew solid food, and only then can he imitate onomatopoeia and subsequently speak).

Thinking is purposeful. The need for thinking arises when a person has a new goal, a new problem and new conditions of activity.

Thinking often begins with an analysis of a problem situation that has arisen. As a result of its analysis, a task arises and forms, which a person must solve, therefore, thinking unfolds as a process of solving a problem in which conditions and requirements are highlighted.

Basic types of thinking

Depending on the direction of thinking, types are distinguished:

1) practical and theoretical;

2) logical and intuitive;

3) autistic and mythological;

4) creative

Practical thinking Theoretical thinking

• Performed in the course of practical activities and aimed at solving practical problems.

• Starts with a problem situation that needs to be solved.

• Occurs in conditions of lack of time, danger or high responsibility for the decision being made.

• Aimed at transforming reality.

• Aimed at the knowledge and explanation of the phenomena of reality.

• The process of thinking involves the creation of a hypothesis, a new idea or image, as well as testing the hypothesis for compliance with reality.

Intuitive thinking

With intuitive thinking, the transition to new knowledge occurs through "insight" (enlightenment).

The thought process is unconscious. Intuitive thinking performs the function of obtaining new knowledge in non-rational ways.

Intuitive thinking performs the function of obtaining new knowledge.

Logical thinking

• With logical thinking, there is a smooth logical transition from the given to the new

• The process of thinking is conscious, separated from its product, and methods of action are isolated and turned into operations applicable to many similar objects

• The objects of logical thinking are sign systems

• Logical thinking performs the function of translation (already received knowledge) to another.

Developed thinking is a complex unity of logical and intuitive components that are closely interconnected. In solving problems, intuition acts as a component of generating hypotheses and decision strategies in the form of complex search guidelines that combine semantic and logical features in non-standard combinations.

Autistic thinking

Autistic thinking. The concept of autistic thinking appeared in psychiatry. E. Bleuler describes autistic thinking as one that "does not pay attention to contradictions with reality." Autistic thinking is actively directed towards escape from reality in order to obtain affective satisfaction in the inner world.

In modern psychology, the problem of autistic thinking is being studied in connection with the study of the influence of a computer on the human psyche. The phenomena of escaping reality into computer games, the formation of "Internet addiction", leading to autism of a person, narrowing the scope of interests are described.

However, modern researchers note that “informatization can lead both to autism and to the stimulation of creative imagination, the development of cognitive abilities and self-actualization.

Mythological thinking

Mythological thinking is in most ways similar to autistic thinking. Mythological thinking has a social character and is based on the collective ideas of society, and not of an individual. This type of thinking involves certain actions (mysteries, rituals, ideologies, etc.) and, like autistic thinking, has a reduced sensitivity to criticism.

Memory

Memory - it is the memorization, preservation and subsequent reproduction by the individual of his experience. In memory, the following main processes are distinguished: memorization, preservation, reproduction and forgetting.

Memory as a system of processes for organizing information for the purpose of memorization, preservation and reproduction can also be considered as a substructure of intelligence - a systemic interaction of cognitive abilities and the knowledge that a person has.

Memory provides the unity and integrity of the human person.

Separate types of memory are allocated in accordance with three main criteria:

1) die to MENTAL ACTIVITY ACCORDING TO THE CHARACTER OF MENTAL ACTIVITY, which prevails in activity, memory is divided into motor, emotional, figurative and verbal-logical;

In different types of activity, different types of activity may predominate: motor, emotional, sensory, intellectual. Each of these types of activity is expressed, respectively, in movements, feelings, images, and thoughts. The types of memory that serve these processes are called motor, emotional, figurative and verbal-logical memory.

Motor memory

Motor memory - is the memorization, preservation and reproduction of various movements and their systems. Without a memory for movement, a person would have to learn to walk, write, etc. every time.

Emotional memory

Emotional memory - is a memory for emotions, feelings, experiences. Emotions always signal to us how our needs and interests are satisfied, how our relations with the outside world are carried out. Feelings experienced and stored in memory act as signals that either encourage us to action or keep us from it. The ability to empathize with another person is also based on emotional memory. Often it is emotional memory that is stronger than other types of memory.

Figurative memory

Figurative memory - is a memory for images, ideas, pictures of nature and life, as well as for sounds, smells and tastes. A person receives information through different senses: sight, hearing, smell, touch and taste. Accordingly, they distinguish: visual, auditory, olfactory, tactile and taste memory. Some people are able to call up very vivid memory images in their minds that are detailed and visual - eidetic images.

Verbal-logical memory

Verbal-logical memory - is memory for thoughts. Thoughts do not exist without language, therefore memory for them is called not just logical, but verbal-logical. Verbal-logical memory is present only in humans (as opposed to emotional, motor and figurative, which in their simplest forms are also characteristic of animals), and the development of all other types of memory depends on its development.

2) due to goals ACTIVITY BY THE NATURE OF THE GOALS OF THE ACTIVITY - into involuntary and arbitrary;

Depending on the purpose of the activity, memory is divided into involuntary and arbitrary.

Involuntary memory

Involuntary memory - is memorization and reproduction, in which there is no special purpose. What happened to involuntary memory? What situations involuntarily “crash” into our memory? The material associated with the achievement of the goal is better remembered in comparison with the achievement and is implemented with the achievement of the goal. Background stimuli were the worst remembered. It is involuntarily remembered completely and accurately, which has a special meaning for us, which arouses our interest and emotions.

Arbitrary memory

Arbitrary memory sets itself the task of specifically remembering what is needed.

In arbitrary memorization, motives that encourage memorization play an important role.

• When using rational methods, arbitrary memorization is more effective

• The concept is remembered faster and stronger, as it is associated with previously acquired knowledge.

3) due to DURATION retention BY THE DURATION OF STORAGE - for short-term, long-term and operational.

For example, the number of repetitions (one or more) does not affect the result of playback with a delay of two seconds, but already with a delay of eight seconds, the productivity of playback is affected by the dependent variable on the number of repetitions.

The idea of ​​the existence of two types of memory received a second wind after the emergence of cybernetics. N. Wiener in 1948 divided memory into current and permanent.

If we classify memory by time, then we can distinguish the following types of it: short-term, operational and long-term. The main difference between them is the storage time of information.

Short-term memory is characterized by very short retention after a single very short perception and immediate reproduction (in the very first seconds after the perception of the material). Information is stored in short-term memory for no more than 20 seconds.

The amount of short-term memory in an adult is fixed, whether it be units of visual information (letters) or auditory. This volume became known as the "magic number", equal to 7±2. Short-term memory is associated primarily with the primary orientation in the environment and therefore is mainly aimed at fixing the total number of newly appearing signals, regardless of their informative content.

Operational memory is the ability of a person to retain the current information necessary to perform an action; the duration of storage is determined by the time the action is performed. The simplest example of random access memory is the storage of the first words of a received speech message during the entire time it is listened to.

Long-term memory stores information for future use. Information in long-term memory can be stored for days, months and years (the birthday of the mother-in-law must be remembered!). Long-term memory is focused on the future, on the preservation of the individual experience of the individual.

The ratio between high, current and long-term memory depends on the tasks solved by the subject of this activity, and on the structure of the activity itself. In some cases, the leading place belongs to export memory, in others - to long-term memory.

Basic mnemonic processes

Memory processes include memorization (reinforcement), reproduction (actualization, renewal), as well as storage and forgetting of material. In these processes, the connection between memory and activity is especially clearly manifested.

Memorization - is a process of memory, as a result of which the new is consolidated by linking it with the previously acquired. Memorization is a necessary condition for enriching the individual's experience with new forms of behavior and knowledge.

Reproduction is a process of memory, as a result of which the previously fixed content of the psyche is actualized by extracting it from long-term memory and transferring it to operational memory. Remembrance - is the reproduction of images of our past, localized in time and space.

Forgetting - is a process characterized by a gradual decrease in the possibility of recalling and reproducing material. It is known that some events can be "repressed", while others cannot be deliberately forgotten. Forgetting proceeds especially intensively after memorization, and then the process of forgetting slows down. At the same time, the more material is realized, the slower it is forgotten.

The process of forgetting, like the process of reproduction and memorization, has a selective character: material that is significant for a person, of course, is forgotten more slowly.

Storage - is a phase of memory characterized by long-term storage of perceived information in a latent state.

Attention

Attention - is one aspect of human consciousness. In any conscious activity of people, it manifests itself to a greater or lesser extent: whether a person listens to music or peers into a drawing of a detail. The presence of attention in human activity makes it productive, organized and active.

Attention should be paid to the provision of electoral programs of action and the maintenance of constant control over their course.

Orientation means the selectivity of this activity and its preservation, and concentration means deepening into this activity and distracting from everything else.

Using an objective experimental method, W. Wundt established that simple reactions to visual and auditory stimuli depend not only on the characteristics of external stimuli, but also on the attitude of the subject to the perception of this stimulus. He called the simple entry of any content into consciousness perception, and the concentration of clear consciousness on individual contents - attention, or apperception.

In modern psychology, it is customary to single out the following criteria for attention:

1) external reactions - motor, vegetative, providing conditions for better signal perception. These include turning the head, fixing the eyes, facial expressions and posture of concentration, holding the breath, vegetative components of the orienting reaction;

2) concentration on the performance of certain activities. This criterion is the main one for "activity" approaches to the study of attention. Associated with the organization of activities and control over its implementation;

3) increasing the productivity of cognitive and executive activities. In this case, we are talking about increasing the effectiveness of "attentive" action (perceptual, mnemonic, mental, motor) in comparison with "inattentive";

4) selectivity of information. This criterion is expressed in the ability to actively perceive, memorize, analyze only part of the incoming information, as well as in responding only to a limited range of external stimuli.

The degree of attention - is a characteristic of its intensity. As a subjective experience, it is evaluated.

There are several different classifications of types of attention.

1) sensual (sensory) and mental (intellectual)

2) direct, if the object is interesting in itself, and derivative (mediated), for example, by motivation;

3) involuntary, or passive, requiring no effort, and voluntary (active), accompanied by a sense of effort.

Classification based on arbitrariness is the most traditional.

Involuntary attention occurs unintentionally, without any special effort. Objects associated with the needs, feelings and desires experienced by a person at the moment cause involuntary attention.

Basic properties of attention

1) Concentration of attention characterizes the intensity of concentration and the degree of distraction from everything that is not included in the field of attention.

2) The distribution of attention is such an organization of mental activity in which two or more actions are performed simultaneously. The main condition for the successful distribution of attention is that at least one action must be at least partially automated, brought to the level of a skill.

3) The amount of attention is the number of unrelated objects that can be perceived simultaneously clearly and distinctly. The wider the scope of attention, the more objects are perceived at a particular moment in time. In an adult, the average volume of visual attention is three to five (rarely six) objects, while in younger students it is from two to four. Training only stabilizes the results at the upper limit.

4) Switching attention is a deliberate, purposeful change in the direction of mental activity, due to the setting of a new goal. Thus, any transfer of attention to another object cannot be attributed to switching. This is the most important condition for maintaining mental adequacy. If we can't switch then we get obsessions.

5) Sustainability of attention is the degree and duration of concentration of consciousness. No one is able to continuously focus attention on an unchanging object of thought. When the object does not deliver new experiences, attention is diverted from it (to maintain stability of attention and better concentration, you need to take breaks every 45 minutes).

Imagination

Imagination refers to the "universal" mental processes. Imagination is the mental process of creating an image of an object by transforming reality or ideas about it. The result of the process of imagination are the images of the imagination. They may arise in accordance with the instructions of another subject, based on viewing photographs, paintings, movies, listening to music, perceiving individual sounds and noises, or by describing an event, thing, character, or association with something. .

Imagination relies on past experience, and therefore images of the imagination are always secondary. But unlike memory processes, the task of preserving and accurately reproducing information is not set here. In the imagination, experience is transformed (generalized, supplemented, combined, acquires a different emotional coloring, its scale changes).

Unlike mental images (concepts, judgments, conclusions), the control function is significantly reduced here. The imagination is relatively free, because it is not constrained by the task of assessing the correctness of what our consciousness or subconscious produces.

Basic Functions of the Imagination

Goal-setting - the future result of the activity is created in the imagination, it exists only in the mind of the subject and directs his activity to obtain the desired goal.

Anticipation - modeling the future (positive or negative consequences, the course of interaction, the content of the situation) by summarizing the elements of past experience and establishing cause-and-effect relationships between it.

Combination and planning - creating an image of the desired future by correlating elements of perception and past experience with the results of analytical and synthetic activities.

Substitution of reality - a person may be deprived of the opportunity to really act or be in a certain situation, then by the power of his imagination he is transferred there, performing actions in his imagination, thereby replacing the real reality with the imaginary one.

Penetration into the inner world of another person (empathy) - on the basis of a description or demonstration, the imagination is able to create pictures of what is experienced (experienced at a given moment in time) by another being, thereby allowing you to know your inner world; this function serves as the basis for understanding and interpersonal communication.

Forms of imagination

All forms of imagination can be divided into two large groups: involuntary and arbitrary forms.

1. Involuntary forms of imagination do not depend on the goals and intentions of a person, their flow is not controlled by the work of consciousness, they arise when the degree of its activity decreases or the work is disturbed.

Dreams - are involuntary forms of imagination. These images are born by our subconscious or are associated with the residual activity of certain parts of the cerebral cortex.

The disorder of the work of consciousness gives rise to such a form of imagination as delirium (mania). Delusions can occur as a result of a mental illness (delusions of persecution, delusions of grandeur), a viral or catarrhal disease accompanied by high fever (delusional delirium), alcohol poisoning (delusional tremens).

Imagination images that arise in delusional states, as a rule, have a negative emotional connotation. Under the influence of certain toxic and narcotic substances, hallucinations appear. This is a heightened unrealistic perception of reality, distorted by reduced mind control and transformed by the imagination.

Turning off the control of consciousness under the influence of another person is called hypnosis, they resemble real perception, but they are suggested, that is, they exist only in the psyche of the hypnotized person, they disappear and appear in accordance with the hypnotist's setting. resemble real perception, but are suggested, that is, they exist only in the psyche of the person being hypnotized, they disappear and appear in accordance with the hypnotist's setting (cognitive interview).

An intermediate position between involuntary and arbitrary forms of imagination is occupied by dreams. With involuntary forms, they are related by the time of appearance. The similarity with arbitrary forms is due to the presence of intention and the ability to control the process at the request of the person himself. Dreams always have a positive emotional coloring.

The second group - is arbitrary forms of imagination. They are subordinate to the tasks of activity and arise on the basis of the work of consciousness.

This group includes fantasies, fictions, scientific, artistic, technical creativity of adults, creativity of children, dreams and recreative imagination. A form of recreative imagination is also called representation. Imagination images are created here on the basis of some kind of visualization (descriptions, presentation of details, etc.). Recreating imagination - is a necessary condition for mutual understanding of people in communication, an indispensable element of learning.

A dream is an image of a desired future. She has great motivating power. A person strives for its implementation, despite various obstacles.

Children's fantasies rely on the substitute function of the imagination. They can be changed, transformed both by external influences and at the request of the child himself.