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THEORIES OF ATTENTION IN DOMESTIC AND WESTERN PSYCHOLOGY

The question of the attention nature is the one of the most important in modern psychology. Theoretical dissociation does not allow researchers to effectively move in the study of this mental phenomenon. Modern researchers use a variety of tools based on different theoretical approaches and therefore, their results cannot be brought together for general analysis. This problem complicates applying opportunities of these studies. The aim of this work was to analyze and present theories of attention in Western and domestic psychology. Through this analysis of the theoretical path, we can assume the next step in the development of understanding of attention. The theoretical review is made in chronological order with the block of the Western psychologist's theories review and then the domestic psychologist's theories review. The review presents the theories of the following Western psychologists: William James, Wilhelm Wundt, Edward Titchener, Edgar Rubin, Kurt Koffka, Wolfgang Kohler, Donald Broadbent, Ulric Neisser, Daniel Kahneman, Michael Posner, Richard Shiffrin, Donald Norman, Tim Shallice, Alan Allport, Odmar Neumann. Theories of domestic psychologists are presented by the following authors: Nikolay Lange, Nikolay Dobrynin, Nikolai Bernstein, Pyotr Galperin, Pyotr Zinchenko, Dimitri Uznadze, Alexey Leontiev, Yuliya Gippenreyter, Yuri Dormashev. As a result of the theoretical review, a considerable dissociation of the researchers was revealed concerning the essence and nature of attention. The work is valuable for those who have begun to study attention, because it gives an overview of all approaches to the issue of attention. In addition, thoughtful and consistent analysis of the existing theories of attention can lead researcher to create a new, unified theory of attention, which will be able to unite the divided camps of different psychological approaches.

Key words: attention, attention theories, attention conceptions.

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Отандық және батыстық психологиядағы зейін теориялары

Зейіннің табиғаты қазіргі заманғы психологияның едәуір маңызды сұрақтарының бірі болып табылады. Зерттеушілерге осы психикалық құбылысты тиімді зерттеуге теориялық алшақтық мүмкіндік бермейді. Қазіргі заманғы зерттеушілер түрлі теориялық негіздер бойынша әртүрлі құралдарды пайдаланады, сондықтан олардың нәтижелерін жалпы талдау үшін біріктіру мүмкін емес. Бұл мәселе осы зерттеулердің қолданбалы жағын қиындатады. Бұл жұмыстың мақсаты батыстық және отандық психологтардың зейін теориясын талдау және ұсыну болды. Теориялық талдаудың арқасында зейінді түсінуді дамытудағы келесі қадамды ұсынуға болады. Теориялық шолу блок бойынша хронологиялық ретпен құрылған: батыс психологтарының теориялық шолуы, содан кейін отандық психологтардың теориялық шолуы. Шолуда келесі батыстық психологтардың теориялары берілген: Уильям Джеймс, Вильгельм Вундт, Эдвард Титченер, Эдгар Рубин, Курт Коффка, Вольфганг Кёлер, Дональд Бродбент, Ульрик Найссер, Даниел Канеман, Майкл Познер, Ричард Шиффрин, Дональд Норман, Тим Шаллис, Алан Олпорт, Одмар Нойманн. Отандық психологтардың теориялары келесі авторлармен берілген: Николай Ланге, Николай Добрынин, Николай Бернштейн, Петр Гальперин, Пётр Зинченко, Дмитрий Узнадзе, Алексей Леонтьев, Юлия

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Гиппенрейтер, Юрий Дормашев. Жасалған теориялық шолудың нәтижесінде зейіннің табиғаты мен мәніне қатысты зерттеушілердің айтарлықтай алшақтығы анықталды. Бұл зейін мәселесіне назар аударған құнды жұмыс болып табылады, өйткені ол зейін мәселесіне қатысты барлық бағыттарды қарастырады. Сонымен қатар, зейін теорияларын ойдағыдай және дәйекті талдау зерттеушіге әртүрлі психологиялық бағыттағы алшақ лагерьлерді біріктіретін жаңа, бірыңғай зейін теориясын құруға әкелуі мүмкін.

Түйін сөздер: зейін, зейін теориясы, зейін тұжырымдамасы.

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Теории внимания в отечественной и западной психологии

Вопрос природы внимания является одним из наиболее важных в современной психологии. Теоретическая разобщенность не дает исследователям эффективно продвигаться в изучении этого психического явления. Современные исследователи использует разнообразный инструментарий, основанный на различных теоретических основаниях и поэтому их результаты невозможно свести воедино для общего анализа. Данная проблема затрудняет прикладную сторону использования этих исследований. Цель данной работы – проанализировать и представить теории внимания западных и отечественных психологов. Благодаря анализу пройденного теоретического пути, можно предположить следующий шаг в развитии понимания внимания. Теоретический обзор составлен в хронологическом порядке по блокам: обзор теорий западных психологов, затем обзор теорий отечественных психологов. В обзоре представлены теории таких западных психологов, как: Уильям Джеймс, Вильгельм Вундт, Эдвард Титченер, Эдгар Рубин, Курт Коффка, Вольфганг Кёлер, Дональд Бродбент, Ульрик Найссер, Даниел Канеман, Майкл Познер, Ричард Шиффрин, Дональд Норман, Тим Шаллис, Алан Олпорт, Одмар Нойманн. Теории отечественных психологов представлены следующими авторами: Николай Ланге, Николай Добрынин, Николай Бернштейн, Петр Гальперин, Пётр Зинченко, Дмитрий Узнадзе, Алексей Леонтьев, Юлия Гиппенрейтер, Юрий Дормашев. В результате проведенного теоретического обзора была обнаружена значительная разобщенность исследователей относительно сущности и природы внимания. Работа представляет ценность для приступивших к вопросу изучения внимания, потому что дает обзорное видение всех подходов к вопросу внимания. Кроме того, вдумчивый и последовательный анализ существующих теорий внимания может привести исследователя к созданию новой, единой теории внимания, которая сможет объединить разобщенные лагеря разных психологических направлений.

Ключевые слова: внимание, теории внимания, концепции внимания.

Introduction

The importance of attention in human life and its determining role in selection of the perceptive and conscious experience contents, memorization and learning are obvious. The study of the attention features has a great practical importance for people. However, until recently attempts to give a strictly scientific definition of attention undertaken in the psychological science could be called unsuccessful.

In studies of attention, there is still no consensus neither on the definition of the essence of attention, or whether it is an independent mental process or it's only the qualitative aspect of the various mental processes.

Many psychology scientists have investigated the attention and tried to understand its nature. Below various theories and concepts of attention in Western and domestic science in chronological order are presented.

William James

William James (James, 1890) proposed to distinguish two classes of attention theories. In the first class of theories, called «reason theories», attention is the cause of changes that are observed in subjective experience and in the peculiarities of the course of cognitive processes, when the subject is attentive. For example, attention is the reason for greater clarity of his impressions, better understanding and memorization. To be attentive, the subject must make an effort. In the second class of theories, called «theory of effect», attention is considered as an effect or consequence of the functioning of external mechanisms in relation to it: for example, physiological.

James defined attention as the result of the limited volume of consciousness, as a result of

which attention is authorized to choose the content of consciousness. The essence of attention is concentration, concentration of consciousness, distraction from some things in order to work more efficiently with others.

James considers the problem of the attention existence from two perspectives: the natural and the philosophical. From the science point of view the attention, as a separate process, doesn't exist, and the choice of the object of attention is completely predetermined by the activity of the nervous system in its three aspects: the adaptation of the sense organs, the pre-adjustment of the brain centers, and the inflow of blood to the particular brain center. From the philosophical point of view attention should be considered in the context of the problem of free will and free choice.

The rejection of the concept of attention is equal to the rejection of the recognition of free will, which is unacceptable for James. The choice of the object of attention, accompanied by effort, he sees as a case of «strong will». Therefore, according to James, from the philosophical point of view, attention as a separate process undoubtedly exists, but in scientific terms this is unprovable, since the question of free will on the purely psychological ground is unresolvable.

Wilhelm Wundt

Wilhelm Wundt (Wundt, 1912), relying on the metaphor of consciousness as a field of view, gives a double definition of attention: on the one hand, it's an active process of perception, and on the other hand – a special state of consciousness or part of it, characterized by the clarity of the elements there. If the entry of an element into the consciousness is determined only by the force of the impact, then its entry into the central zone of consciousness, into the «field of attention» is an active process that depends already on the subject. According to Wundt, this is an elementary act of will consisting in «enlarging the units of perception» and accompanied by experience of effort at the periphery of consciousness, or «sense of activity».

Attention is the fixation point of consciousness, the most clear and distinct consciousness. Clarity is achieved by moving the content of consciousness from the perceptual zone, i.e. a vague indistinct perception, into the zone of apperception – a clear and distinct consciousness. Apperception is a manifestation of «special mental activity».

Edward Titchener

Edward Titchener (Titchener, 1909) introduces the metaphor of a «wave of attention». In its definition, attention is the sensory clarity of the contents of consciousness that are on the «crest of the wave», which cannot act as a reason for anything, but is the result of the human nervous system. For Titchener, it's wrong to consider attention as a special power, the ability or the initiative of the knowing subject. This is a certain degree of consciousness, which provides our mental work better results. The emergence of active attention and feelings accompanying the efforts Titchener connects with the complexity of the human nervous system. The more impressions can be presented to it simultaneously, the more difficult it's to make a choice in favor of one of them. A stronger or more meaningful impression dominates only after some period of struggle between them in the nervous system. However, having won, the impression continues to remain on the crest of the «wave of attention» without any effort.

Edgar Rubin, Kurt Koffka, Wolfgang Kohler. Gestalt psychology

The duality of the problem of the attention existence can also be found in Gestalt psychology. For example, Edgar Rubin (Rubin, 1925) insisted that attention does not exist, and therefore this concept does not need psychology and even «harmful» for it, because it introduces an additional concept which in fact reduces to perceptual and thought processes.

Following Rubin, Kurt Koffka (Koffka, 1935) objected to psychologists who viewed attention as an independent force, the cause for greater clarity and distinctness of some consciousness contents compared to others. The division of consciousness into focus and periphery can occur not only due to the subject's mental activity, but by itself, without any internal activity, only because of how the field of perception is organized.

It depends on the structure of the field what will be perceived clearly and distinctly, and what will be the degree of subjective clarity of its separate elements, secondary to the holistic image of the situation (gestalt).

However, Wolfgang Kohler discovered that observer activity can also change the degree of subjective clarity of individual elements of a phenomenal field (Kohler, 1929). In particular, much depends on what exactly will become a «figure» and what «ground» in accordance with the task. This can be proved by using tasks designed to measure the distance between separate elements of the field, in which they are perceived as individual parts of the image, rather than as a whole. It turned out that the value in a particular sample depends on whether the presented image to the observer is a «figure» or

«ground», in other words, whether a person pays attention to it or not.

Koffka tried to combine these two classes of conflicting data, and suggested to define attention as the force linking the observer and the object he perceives. If this force is directed from object to subject, the clarity and distinctness of perception of the image individual parts is dictated by its structure. If the force is directed from the subject to the object, the field structure is changed under the influence of the task. Thus, what a person will notice and perceive depends both on the structure of the field and on the intentions of the person.

Donald Broadbent. Early Selection Model or Filter model of attention

Donald Broadbent (Broadbent, 1958) assumes the existence of a mechanism, a sort of filter that selects certain information among others. Attention is the process of early selection (filtration) of information at the initial stages of its processing in the process of perceptual analysis or immediately before it. The Broadbent assumption created a new model of attention – the filter model.

Broadbent provided a means of comprehension human performance in terms of information processing. Based on his own research and other contemporary evidence, Broadbent suggest a new conception of the mind, in which psychological processes could be described as the information flow in the path of the nervous system.

Ulric Neisser. Constructive theory of attention

Ulric Neisser is a pioneer of a functional approach to attention in cognitive psychology. Its essence lies in the fact that the mechanisms of attention involved in solving the problem depend, first of all, on the task itself, on its content and structure, as well as related representations in the knowing subject experience.

Neisser criticized models of early and late attention selection in connection with the need for special selection mechanisms (filters) in the information processing system. He proposed not to interpret the selectivity of human cognition through the likening of a human being to a technical device with limited capacity. The main difference between a person and such a device is that a person is active. He actively builds and constructs images of those objects that he needs to solve actual problems. These considerations led Neisser to a Constructive theory of attention, where attention was presented as a mechanism for the active process of constructing a perceptual image.

Neisser (Neisser, 1967) completely rejects the linear model of information processing and proposes to consider perception as a cyclically organized perceptual action, or «perceptual cycle» in which selection is carried out due to the fact that a person perceives the world, «anticipating structured information to be obtained «. With the rest of the information, according to Neisser, nothing happens, a person simply ignores it.

Central, guiding in the perceptual cycle is the basic form of storing human knowledge about the world – scheme (this is one of the key concepts of constructivism in the psychology of cognition). The scheme directs research activity, the study «selects» the object, and the information about the object modifies the scheme, clarifying and complementing the original idea of it. This subsequently included in the scheme information will influence what the observer will perceive. With this approach, the selectivity of cognition is determined by the functioning of the scheme in the perceptual cycle, its specificity and settings, which are formed during individual learning. Hence Neisser deduces two consequences important for the construction of the attention theory.

First, there are no special mechanisms of selection. Moreover, there is no attention as a separate process, external to the process of perception. Attention is an active process of perception, considered in the aspect of selectivity. Selectivity acts as a property of the perception process, the manifestation of the anticipating function of the scheme and its continuous adjustment, providing the solution of the problem.

Secondly, there are no resource limitations of the information processing process. If the schemes are able to be coordinated among themselves, if they can be integrated or organized into a single scheme during a specially organized training, then the initial observed limitations can be removed. A person will be able to perform several actions at the same time, for which there should not be enough limited capacity of the information processing system. It was shown that the distribution of attention depends on the observer's skill, formed as a result of the relevant perceptual actions exercise.

Neisser does not revoke limitations in the processing of perceptual information in his theory, but expresses serious doubts that these limitations are central and unified for all possible actions at the moment. Instead of the idea of central limited resources, he proposes that there are no physiological limits of the information that can be processed by the human brain; the only question is the ability to use its resources.

Daniel Kahneman. Capacity theory

Daniel Kahneman proposed Capacity theory (Kahneman, 1973), which assumes the presence of a supervisory mechanism of attention which explains the selectivity of attention.

Central place in the Kahneman's attention model is the «resource allocation policy» block. The function of this mechanism is to select the activity to which the energy is directed and its dosing. The work of this block depends on four factors: changes in the environment, the current intentions of the subject, the limitations of energy resources in the performance of several activities at the same time, the level of physiological activation.

In a later version of the attention model, Kahneman and Treisman (Kahneman, Treisman, 1984) use the organizational metaphor of the psyche. According to this metaphor, the storage and processing of information is carried out by activating a distributed network of elements that form a dynamic system. This structure has a governing body and various departments. Selective attention is the consequence of the management of the certain groups of elements (divisions) activity and their connections with the governing body.

Michael Posner. Shift of Attention Theory

As part of the capacity theory of attention, Michael Posner (Posner, Snyder, 1975) hypothesized the existence of two types of attention: unconscious and conscious. Unconscious or automatic attention does not intersect with other mental activities. Conscious or active attention intersects with mental activity and to some extent interferes with it. Active attention the authors compared with the operation of the computer CPU limited capacity, which, depending on the task can be selectively and actively adjust to a certain modality, feature or category of input information. The setting of active attention was called orientation and it's determined by the objectives of the subject.

Richard Shiffrin. Two-process theory of attention

In the theory of selective attention, Richard Shiffrin (Schneider, Shiffrin, 1977) also asserts the existence of a special controlling mechanism, a regulator of attention. The attention regulator can interfere with the processing of information at any stage. The inclusion of the selection mechanism in the early or late stages of processing is determined by the significance of the signal and the formation of long-term memory structures.

Donald Norman, Tim Shallice. Attention to Action or Supervisory Attentional System

In the proposed by Donald Norman and Tim Shallice (Norman, Shallice, 1986) activation model of voluntary and automatic behavior management, attention performs the function of controlling external and internal actions performed by a person on the basis of action schemes, the activation of which in the memory system leads to the execution of the action.

Norman and Shallice suggested that each of the available schemes is characterized by a certain level of activation, which is set by a combination of a number of factors, both external and internal. The scheme is selected, i.e. allowed to control the action if its activation level exceeds the threshold. The selected scheme directs the execution of the action or sequence of actions until one of the following conditions is met: either the scheme is voluntary «disabled» or removed from the control of the action; or all the proposed scheme operations are performed (the goal of the action is achieved); either the scheme is blocked due to the fact that there are not enough resources for processing information (for example, these resources are used by another, more activated scheme) or the information itself.

The prevention of competition for structures and processing operations and the organization of their joint use are carried out through mutual activation support each other's schemes and mutual inhibition of the conflicting schemes.

In the case of arbitrary execution of the action, the activation value of the scheme is determined by another factor – downward influences. The sources of downward influences include primarily the motivation of the cognizing subject. This is a slow system of influences associated with the long-term intentions of the subject. In addition, the level of activation schemes can be affected by the work of the so-called «attention dispatcher service», which comes into play if the source scheme for the necessary action is missing: for example, if a person solves a new or complex problem.

Attention is the result of this system operation, it controls only the amount of activation and inhibition, but not the selection process. Selection is a consequence of greater or lesser activation of the scheme at the time when the «conflict prevention» mechanism takes effect.

Thus, the Attention to Action mode of Norman and Shellac combines both the selection mechanism and the mechanism for allocating «attention resources». But both mechanisms are grouped around the concept of «scheme of action»: the scheme of action is or is not subject to selection depending on the circumstances, the scheme needs or does not need additional activation (inhibition) in order for the action to be carried out or stopped.

Alan Allport. Convection Theory of Attention

Alan Allport (Allport, 1980a,b) considers attention (selectivity of consciousness) as an evolutionary mechanism that provides selective control of the action based on incoming information, that is, functions as a «selection for action».

The principle of selection for action is the need to focus or limit the environmental factors that control specific motor act. Errors of attention and delays in the performance of actions are evidence that the system, optimally adapted to normal conditions, needs additional time to solve the problem in an artificial environment.

The causes of attention interference are related to the content of actions. Each action has a goal (or an object over which an action is performed), a mode of action, and a combination of the action and the object to which it's performed. Considering the external sources of interference, four reasons can be assumed: 1) the unpredictability of environment events and the temporal characteristics of the these events course; 2) restrictions associated with the setting and retention of goals; 3) restrictions on the function; 4) restrictions associated with the interface of goals (objects) and actions.

Thus, Allport suggested the existence of a parallel multi-channel distributed information processing system, which consists of a set of neural specialized modules.

In the system, information processing occurs in parallel and can be distributed at once to many components scattered across different departments and levels of the central nervous system. Memory is part of this system in the form of stable or temporary connections of modules. The function of attention is to organize the interaction of individual modules of a distributed system, which ensures consistent and harmonious behavior. This is the common goal of various attention processes.

Odmar Neumann

Odmar Neumann (Neumann, 1987) also shares a view of attention as a «selection for action». He correlates the schemes with human skills and abilities stored in long-term memory which are based on the principle of embeddedness: larger schemes (high-level, or «action plans») include smaller (low-level, or «skills»). To achieve one or another goal, a certain combination of schemes must be selected, which will be allowed to control the motor system.

Each of the skills is potentially manage one or another executive body, but the number of executive bodies is extremely limited, so the first task that must be resolved by the system of «attention for action» is the establishment of a one-to-one correspondence between the skill and the executive body. To describe the mechanism of attention Neumann offers a metaphor for the organization of train traffic on the railway system.

Psychological and neurophysiological data shows that the human brain works on the principle of blocking or inhibition. At any given time, only one high -level scheme (action plan) has access to the particular executive body. The rest of the possible actions must wait until this body is released.

Another task of the attention system for action is the «parameter specifications». By definition, any skill stored in memory is schematic, that is, it is generalized and does not contain all the information necessary to control the action under given conditions. This missing information should be extracted from the environment. At the same time, the parameters available in the environment to perform an action could correlate with the selected skill or action plan in three ways: the data can be sufficient, insufficient or redundant. If the data is sufficient the action can be performed «automatically».

If there is not enough data to perform the action, which is typical for unexpected or unusual situations, then there are two ways out of this situation: either to assign parameters «by default» (for example, in the instinctive behavior of animals in the absence of adequate stimulus), or through voluntary action planning, especially if it's not well mastered. Executing the actions in parts and feedback about their effectiveness lead to the fact that it becomes easier for a person to assign action parameters either «by default» or according to information received from the environment.

If a person face with an excessive amount of data (if there are more data than is necessary to specification the skill parameters), the problem of data selection occurs. Neumann solves this problem in the same way as other theorists of «attention for action». According to the Neumann hypothesis, the action can be performed only due to the fact that as a result of using the parameters of one of the objects, all other objects are simply disconnected from any kind of actions. Limitations of attention and related the interference of the actions performed with them are correlated with the problems of establishing a correspondence between the perceived object and the scheme of action. Interference is unavoidable if the necessary and redundant information is contained in one object, which is particularly the case for Stroop effect (Stroop, 1935). The process of establishing compliance, connecting to the schemes of necessary objects and disconnecting unnecessary ones can be put in line with the notion of attention.

Nikolay Lange. Motor Theory of Attention

In the works of Nikolay Lange could be find prerequisites for consideration of attention through its place in the cognitive activity of the subject. He understood attention as an appropriate reaction of the organism, instantly improving the conditions of perception (Lange, 1893). This definition is based on the idea that attention is included in the implementation of the act of «perception» in the broad sense of the word and improves its results, and cannot be considered in isolation from this act, outside its purpose and products. Developing this idea, Lange proposed a motor theory of attention.

Nikolay Dobrynin

Nikolay Dobrynin considered attention as one of the form of individual activity and identified it as the focus and concentration of mental activity (Dobrynin, 1938), where the direction is choosing certain activities and maintenance of this choice, and concentration is deepening into this activity and the removal, distraction from any other activities. Thus, attention is defined through the activity, functions in it (and not outside it and not beyond it, as Dobrynin emphasized) and is responsible for its direction and retention in a certain direction.

Nikolai Bernstein. Level theory of movements organization

In the Nikolai Bernstein concept (Bernstein, 1947) any human movement can be considered as a process of solving the motor problem in the given conditions. Movement is built on several levels, provided by different levels of the central nervous system, from simpler and more ancient to more complex and new, developed only in humans.

Bernstein identifies five such levels. Lower level (A) level of tone, participates in any movement and is responsible for maintaining muscle tone; (B) the level of synergy, responsible for coordinating the tension of certain muscles; (C) the level of the spatial field, responsible for simple, non-objective motion in space; (D) the level of objective actions, responsible for organizing interaction with objects; (E) the level of intellectual motor acts, responsible for speech movements, writing, symbolic or coded speech.

Almost any movement involves several levels, among which one can distinguish the leading level corresponding to the meaning of the task, and the underlying «background» levels that provide certain aspects of its implementation and are not directly related to the content of the task. For the majority of subject-practical actions of a person, the level D (objective actions) acts as a leading one. The process of constructing a movement is carried out cyclically. During movement it is corrected both at the leading and background levels in accordance with the task and with changes in the environment.

Corrections are carried out due to the fact that a person has information about the necessary characteristics of the movement, determined by his program, and information about how the movement is currently occurring. A special correlation device determines what and how should be corrected in the motor act at each of the levels of its construction to bring it into line with the program.

Despite the fact that Bernstein considers only motor tasks and the essence of the model consists in correcting the performed motions in accordance with the task and the conditions for its implementation, the task can be perceptive. In particular, Boris Velichkovsky (Velichkovskij, 1982) sees the six-level mechanism behind the solution of perceptual problems, adding to another five levels of the motor act regulation according to Bernstein (he finds perceptual processes analogues for levels A to E) the sixth level F, which is level of metacognitive coordination , providing the construction of the world image and a mental model.

Pyotr Galperin. Theory of Gradual Development of Intellectual Actions

Pyotr Galperin (Galperin, 1958) defined attention as an independent form of mental activity, a special activity of mental control, which is formed on the basis of the control phase of any activity. Galperin finds «mental control» the specific content of the attention activity, which allows to distinguish such activities and experimentally form the mental actions of attention with the required properties, based on the theory of Gradual Development of Intellectual Actions.

Galperin noted that in observation and self-observation attention is never given as a separate process, it's always «dissolved» in other processes, accompanies them, acts as their side and deprived of its own content. On the other hand, attention does not have its own product, but only improves the products of other cognitive processes and activities – for example, makes the image of perception more clear and distinct.

Pyotr Zinchenko

Pyotr Zinchenko studied the relation between activity organization and involuntary memorization: «Despite the fact that the nature of attention is still being discussed in psychology, one is unquestionable: its function and impact on the productivity of human activity cannot be considered in isolation from the activity itself» (Zinchenko, 1961). Attention should be studied not from the subject and not from the

features of the attention object, but from the content of activity, from the role that it performs in it.

Dimitri Uznadze. Theory of Set

Modern cognitive psychologists often consider attention in connection with the concept of preparatory set in solving the task (Osugi, Kawahara, 2013). One of the first attempts to connect the theoretical concepts of attention and the set was undertaken by Dimitri Uznadze, who defined the set as a holistic and usually unconscious condition of the subject, a holistic direction of it in a certain direction for a certain activity, as a willingness to commit a particular action or to respond in a certain direction (Uznadze, 1966). To a set as the state of the organism he opposed specifically the human mechanism of objectification, stopping, delaying on the subject of thought or action, overcoming impulsiveness behavior. Uznadze correlated with the notion of objectification the functioning of voluntary attention. Different forms of involuntary attention in his theory are well correlated with the notion of set.

The closest to this understanding of the set in cognitive psychology is the concept of preparation for the task, which refers to the adjustment of the subject to solve a problem in a certain way or readiness to process some information about the stimulus.

Alexey Leontiev. Activity theory

Alexey Leontiev considers attention as a controlling and organizing process of activity. According to Leontiev, if we look to the circle of perceptual attention, we can see that these peculiar phenomena are covered more fully, closer and more precisely by the doctrine of perception and perceptual activity (Leontiev, 1975). Therefore, attention should be studied through analysis of the structure and dynamics of certain activity. The structure and dynamics of activity can be judged both by its products and by objective indicators that determine the external side of the activity.

Yuliya Gippenreyter

Yuliya Gippenreyter defines attention as a property or characteristic of the functional-physiological system of activity (Gippenreyter, 1983). In other words, this property or characteristic of the entire functional-physiological system of activity is not an element of this system, but only an appearance of its work in the mind and in the results of activity (through increasing its productivity or efficiency), provided by physiological mechanisms. Attention does not exist as a separate activity, we cannot find it in the form of individual actions or operations, and all its appearance are somehow connected with the purpose and program of other purposeful actions carried out by person.

Gippenreiter considers the theory of activity as the basis for the implementation of a multifaceted approach to attention: from the consciousness, from the activities and from physiological processes. In this regard, she proposes a three-component scheme for the analysis of attention:

Activity and its level structure: motive that drives and directs the activity; the goal that determines the action; operation which allow achieving the goal under these conditions.

Consciousness is a collection of phenomena that give attention to the subjective criterion, as well as its subjective effects: the allocation of focus and periphery in the consciousness, the clarity and distinctness of consciousness of the attention object, the experience of mental effort, etc.

Physiological mechanisms which can be designated as realizers and means of activity

The Gippenreiter's three-component scheme emphasizes the inextricable connection of activity and its physiological mechanisms: they are arranged into a system that is designated as a functional-physiological system of activity and is determined by the structure of activities and the task.

From the psychological structure of activity in the consciousness the goal of the action (the image of the future result) is presented, into which the objectively specified requirements must be transformed. The object that corresponds to the purpose of the action is the object of attention. From the physiological mechanisms of activity in consciousness, stimuli of the organization leading level are given: namely, these aspects of the action organization that correspond to the meaning of the problem being solved.

Yuri Dormashev

Yuri Dormashev (Dormashev, Romanov, 1995), agreeing with the analysis of attention in terms of activity, nevertheless considers its special activity with its own content and functions, as an act aimed at a functional-physiological system of activity.

According to the position of Dormashev, among the attention functions as an activity could be distinguished following: actualization (launch), retention, suppression, destruction, transformation and construction of functional-physiological system of activity. In other words, attention acts as a separate executive act, possibly with a motor mechanism. Its functions in each of the possible situations depend on the nature of the task.

Conclusion

Traditionally the problem of attention considered as the one of the most important and complex problems in scientific psychology. The development of the entire system of psychological knowledge, both fundamental and applied, depends on its solution.

As can be seen from these theories, the definition of the essence of attention remains an unresolved problem in psychology to this day. There are many views, on the one hand emphasizing the attention as a separate process, and on the other reducing it to some specific mental process, denying its independent existence. But such statement does not shed light on the question what is the nature of attention. It was given a large number of different answers throughout whole period of time. The question of the nature of attention continues to be strongly debated in modern psychology and cannot be considered complete.

Perhaps in the near future, on the basis of these concepts, a unified attention theory will be created, which would be able to combine different approaches in one theoretical and applied direction.

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