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THE ACTIVITY THEORY: THE ACTIVITY PSYCHOLOGICAL FUNCTIONAL SYSTEM AND ABLITIIES AS A MECHANISM OF ACTIVITY IMPLEMENTATION

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Abstract

The analysis of theoretical work on the psychology of activity by leading Russian psychologists has shown that the principle of the activity approach is deeply and comprehensively developed in Russian psychology and has reasonably acquired the status of a paradigm. Conceptual models of the activity approach can be successfully applied while setting exploratory programs and developing specific research designs. It can be reasonably argued that the activity approach has not only had a rich past, but it also has a successful present and future. This study reports on the general structure of the activity psychological functional system (APFS) that is close to the general structure of the physiological functional system suggested by P. K. Anokhin. However, the APFS in its components and the relationships between them is filled with a new content that is primarily determined by the human mind. The issue of the ability's place in an activity structure is addressed in this paper. Understanding activity from the standpoint of system genesis reveals the essence of human development processes and provides for understanding of the relationship between activity and development; it shows the place of abilities in the implementation of activities and enables the understanding of the development mechanism in abilities and activities. It is shown that abilities are mechanisms of activity realization, and that activity may be considered from the position of a system of abilities employed to accomplish it that undergoes permanent changes in regard to the composition and the extent of the constituents' interaction.

Keywords: ability, activity psychology, activity psychological functional system, operation.

Introduction

The activity approach has been presented as a paradigm in Russian psychology and a model for formulating questions and for solving them. The works of S. L. Rubinstein (1946, 1957, 1997), A. N. Leontiev (1972, 2007), B. F. Lomov (1981, 1984), and K. A. Abulkhanova-Slavskaya (1973, 1991) have laid down methodological foundations of the activity approach. A considerable contribution in the development of the given approach has been made by G. M. Zarakovsky (1966), D. A. Oshanin (1977), B. G. Ananiev (1962), P. K. Anokhin (1975), V. A. Lektorsky (2011), N. A. Bernstein (1947), A. L. Zhuravlev (2005), A. V. Karpov (2004), B. A. Bodrov (2006) and V. M. Rusalov (2018). There are various approaches to activity research and it is necessary to dwell on the conceptions that may be used for the purposes of our investigation. In this study we limit ourselves to an analysis of theoretical constructs of activity in works by S. L. Rubinstein, A. N. Leontiev, B. F. Lomov, N. A. Bernstein and A. L. Zhuravlev.

Understanding Activity in Works by Alexey N. Leontiev

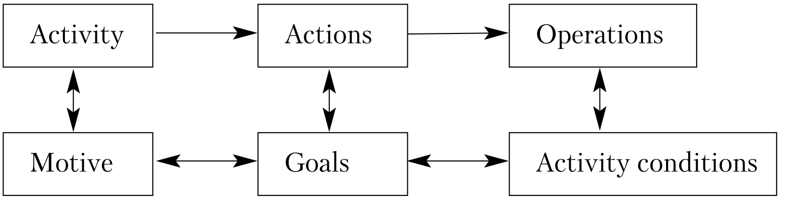
When activity is discussed in Leontiev's understanding, first of all its two-level structure is represented (see Figure 1).

In this sense Leontiev wrote that iIn the total flow of activity that forms a human life in its higher manifestations mediated by psychological reflection, the analysis firstly highlights separate (particular) activities based on the criterion of motives that induce them. Then activities that are processes complying to conscious goals are singled out. Finally, there are operations that are directly dependent on conditions of achieving a particular goal. These "units" of human activity form its *macrostructure*. The specifics of analysis that enable the identification of those units are that the analysis reveals inner indicative relationships within the activity rather than it employs breaking living activity into elements (Leontiev, 2007, p. 89). In the proposed activity's structure there are some assumptions that should be taken into account. First of all, the wording "In the total flow of activity that forms the human life" catches our attention. To our mind, this is a key point that brings an activity in life flow connecting it with the individual. It is possible to understand an activity only by understanding the life context. Next let us focus our attention on "particular activities" emphasized by Leontiev. Practically nobody takes notice of this definition but it is a profound idea. To understand an activity (as it was understood by Leontiev), we believe this idea to be a matter of principle. The definition "particular" brings the understanding of the term "activity" into basic philosophical categories such as "unit", "special" and "universal". As it is known objective reality and the process of its cognition are represented by these categories.

To give a more precise definition to activities as "particular" is to enable the consideration of activity as a universal notion diverted from separate activities and at the same time as single, specific in its integrity and singularity. Without an understanding of activity as "specific" it becomes incomprehensible and contradictory to realize Leontiev's approach.

Figure 1

The Structure of Activity according to A. N. Leontiev



Leontiev singled out the separate activities by *the criterion of motives that induce these activities*. However, he considers actions as separate activities that *are directed by conscious goals*. In keeping with this, operations may be considered as actions that depend on a concrete goal attainment. It is obvious that the criteria here are goals and conditions for their achievement. Leontiev suggested the *criteria* to single out activities, actions and operations rather than to attempt to expose the inner structure of activities. Nobody in fact has addressed Leontiev's idea of a separate activity, action and operation being activities. Hence the "structure of activity" vanishes from sight. Any activity, actions and operations are separate activities by their structure, fitting into each other like Russian "Matryoshka" dolls. In the aggregate they are, on the one part, any abstract activity (in terms of universal category), on the other part, they are an isolated implementation of an abstract activity. Thus, the units of the human activity macrostructure singled out by Leontiev propose activity analysis by the study of inner and outer conditions of its implementation.

Finally, it should be said that A. N. Leontiev considered activity from a position of human psyche development. His understanding and construction of activity depends to a large extent on this task. Mostly it was represented in his reasoning about "meaning" and "sense". Having not seen the ultimate underlying task of A. N. Leontiev means to have no understanding of his approach to activity analysis. The unfair generalization of Leontiev's theoretical foundations to activity studies, the "mechanical" spreading of given foundations on productive activity harm his concept.

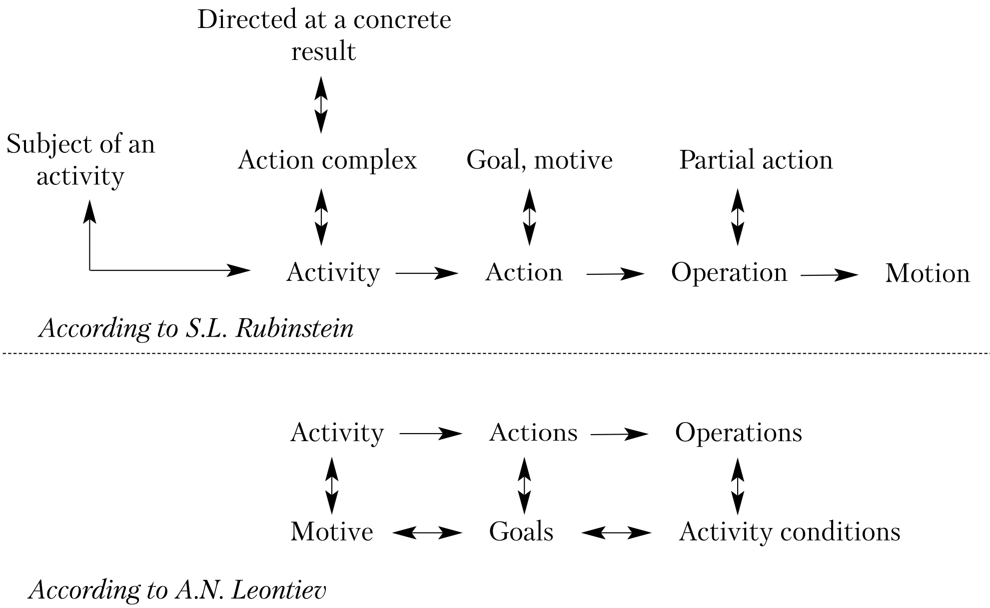
Understanding Activity in Works by Sergey L. Rubinstein

As well as in our analysis of Leontiev's viewpoints on activity, we intend to focus firstly on Rubinstein's activity structure. According to S. L. Rubinstein the structure may be viewed by activity, actions, operations and movement. Rubinstein's concept of the activity psychological structure, although looking almost identical in composition to the activity structure as established by Leontiev, is quite different (see Figure 2).

Rubinstein defines activity as carried out by a set of actions which can be deconstructed into partial actions or operations that are in turn carried out by motions. If Leontiev determines actions by goals and operation by conditions, Rubinstein (1999) asserts that any action directed to a goal proceeds from an impetus that is a more or less conscious motive. While Leontiev defines operation as an action transformation with due regard for conditions of its realization, Rubinstein defines operation as actions or parts dividing an activity. They are considered as partial actions (Rubinstein, 1999). So the general structure is reduced by "activity actions (operations) motion". If we take into account that "motions, especially so called volitional motions, are commonly used to express actions through which a behavior occurs" (Ibid., p. 447), the psychological structure of an activity is reduced to two constituents: activity and actions.

Figure 2

A Comparison of S. L. Rubinstein's and A. N. Leontiev's Compositions of Activity Structure



It should be said that factually in work activities an activity is usually decomposed into either actions or operations. The term "operation" is frequently used in worksheets. On a number of occasions, more often in sports, action is transformed into motion. More important, the term "result" is included by Rubinstein in his system of notions that characterize activity, however, it does not work fully as it has been described.

In Rubinstein's understanding of the psychological structure of action (as well we might say activity on the whole) the *task* is in his special interest. He writes: "To accomplish the goal is to take into account the conditions in which it (goal) would be accomplished. The relationship between goal and conditions sets a task that should be done by action. The human goal-directed action is in its essence task solving" (Rubinstein, 1999). In keeping with this point we might say that activity motives are of primary importance in setting a task, and taking into account outer (objective) as well as inner (subjective) activity conditions is necessary in the process of defining them.

Therefore, we may see essential difference of Leontiev's and Rubinstein's opinions about the activity structure.

The key factor in understanding human activity is the term "subject" that has been developed in works of Rubinstein's closest followers such as A. V. Brushlinsky

(1996) and K. A. Abulkhanova (1973, 1991). According to Abulkhanova the "subject of activity" is a complex of characteristics of psychological conditions of activity, firstly, in relation to the subject's abilities, states, and his/her relationships to the task; secondly, to his/her strategies and tactics; thirdly, to the objective dynamics of activity (activity events and fragments) (Abulkhanova-Slavskaya, 2007, p. 122). In this sense the objective activity becomes individual and is realized by the individual style of activity. The subject predicts his/her activity, develops a program of this activity, and regularly makes decisions by organizing it in time and space, and in relationships with others.

Understanding Activity in Works by B. F. Lomov

Boris Fyodorovich Lomov (1981, 1984) pointed out three aspects of the activity analysis: activity as a socio-historical category, activity as an individual activity, and activity as a joint activity. Following Leontiev's and Rubinstein's propositions towards activity, Lomov is quite right in his statement that the development of activity as a category is a considerable achievement for psychology in our country. At the same time he indicates that in psychological research some frequently use this term taking a broad view of it and defining it differently so there is a risk of diluting the purport of this term (Lomov, 1981).

Analyzing activity as a socio-historical category B. F. Lomov (like A. N. Leontiev and S. L. Rubinstein) noted that understanding an individual activity becomes possible only within a system of public relationships of the society and the stage of its development. He underlined that "activity" as a subject of a great amount of scientific and psychological study of activity inevitably and considerably depends on the success achieved by these sciences (Ibid.). Hence to study an individual activity we have to start with studying individual activity functions within the system of public life and the system of individual interactions with other individuals in that "social context" which includes that activity. The individual activity is of special interest in psychological study, as Lomov put it. The psychologist, by investigating individual activity, studies an activity object, its means and the conditions in which it progresses. These external parameters as a rule are set by the normative mode of an activity. So these parameters have to be analyzed first of all since they set requirements to the subject of an activity. The subject of activity and the internal environment of his/her activity cannot be understood without the study of external characteristics and the conditions of the activity.

According to Lomov the system of processes, states and properties, which are appropriate to be designated as phenomena of the psyche, is an object for the psychological study of activity. He states that first of all psychology is interested in the role and place of the system of processes of psychological reflection in individual (or group) activities (Ibid., p. 96). Motives, goals and their dynamics are of special interest to a psychologist. We cannot but agree with Lomov's assertion that the motive induces only activity, and the goal "constructs" a certain activity defining its features and dynamics (Ibid.). The motive "constructs" the goal of an activity. It induces the activity as well as directs it. The goal is transformed by motive influencing. There is another Lomov's statement that should also be defined more accurately. He states: "having mentioned the setting and realization of a goal it should be underlined that a goal is set by an individual rather than is introduced by anyone into activity (anyway, when we talk about advanced forms of activity)" (Ibid., p. 98). In most cases the goal is a form of normative aim for an individual that is determined by an outcome. This normative aim is transformed with due account taken of motive and conditions of the activity.

In comparison to the works of A. N. Leontiev and S. L. Rubinstein, B. F. Lomov paid much more attention to the study of mental processes that carry out the activity. They are the processes of prediction (anticipation) that form conceptual models and operative images, decision making, activity planning, processing of current information, result assessing and action correction. He also emphasized the unity of external and internal aspects of an activity. Lomov does not share the opinion about the interiorization of external activity into internal activity. He opposes the idea about the identification of structures of external and internal activity and the idea to consider perceptive, mnemic, intellectual and other mental processes as specific kinds of an activity. This issue is much more difficult. If one regards each cognitive process as a process that realizes a certain mental function (and according to S. L. Rubinstein mental function is a generic form of activity), separate mental processes may be considered as specific types of activity. This approach makes clear the understanding of how mental processes, in their systematic emergence, realize activity having been consolidated by the motive of that activity and its goal. The given approach opens up a real perspective to study the internal structure of the activity of the psyche.

The analysis of an individual activity is inevitably related to the analysis of joint activity. Any individual activity is included in a wide context of joint activity. In keeping with this B. F. Lomov states that the starting point of an individual activity analysis is to define its role and place within joint activity, and the function of an individual within a group, respectively (Ibid., p. 102). The communicative function of psyche appears in joint activity along with cognitive and regulatory functions. In joint activity these elements are permeated with communication that plays an organizing role. Through communication, as it is said by Lomov, individuals share knowledge, abilities, skills, motives, goals, plans and so on (Ibid.). But here a question arises of "How psychology deals with communication". This question still remains open.

The Joint Activity in Works by A. L. Zhuravlev

As formulated by A. L. Zhuravlev, the initiation of an integrated joint activity as a new system that is a whole set of individual activities is only one side of the interaction between individual and joint activities. The inclusion of an individual activity in the structure of a joint activity in turn makes changes within the structure of the individual activity of each subject (Zhuravlev, 2005). The point about the character of interactions between individual and joint activities is especially interesting for us. However, we feel this assertion is to be made more precise. The inclusion of individual activity in the structure of joint activity, transforms the content of single structural components and their relationships, rather than affects the structure of an individual activity.

When analyzing the structure of joint activity firstly the individuals" interactions should be taken into account. It is precisely this fact that transforms the structures into a joint activity. A. L. Zhuravlev (2005) has marked out three types of interactions within joint activity using the criterion of the *interaction direction*. They are (1) an interaction that is directed to change the object of a joint activity, (2) an interaction that is directed to change the subject of an individual and collective work, and (3) an interaction that is directed to change organizational and management characteristics of a group life activity.

Finally, it should be said that the study of individual and joint activities is a proper perspective for settling fundamental theoretical issues of psychology.

A Theoretical Model of the Activity Psychological Functional System

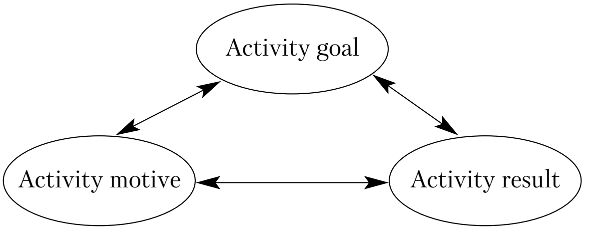
The concepts of the psychological structure of activity formulated by A. N. Leontiev, S. L. Rubinstein, and others reviewed above, are of great methodological importance. However, it should be noted that they do not reveal the activity system that may be used to solve applied problems. So here we should ask is the reason for this. We know that the works reviewed were written between the 1950 and the 1980s when the system approach had its supporters.

The cause is in the given approach itself. In this regards P. K. Anokhin (1975) wrote that there are two reasons for the insignificant result that was obtained in the discussion of the "general system theory'. One reason is a lack of a constructive definition for the "system" notion, and the other reason is the adoption of system methodology. The latter means a radical change in the approach principles regarding elementary processes and the research tactic rather than a change in titles and explanation of the system approach, as it was believed by researchers. In his reasoning Anokhin comes to the conclusion that the interaction as it is does not form the system by a set of components (Anokhin, 1975, p. 32). Systemology should detect a system constituent factor to drive the system approach to a constructive course. According to the author's view, a specific result of system activity might be a factor that determines its functioning. He states that a "result" included in the analysis as the main link revises the generally accepted points on a system and gives a new treatment of some questions that have to be analyzed (Ibid., p. 33).

In developing the activity psychological functional system we have been proceeding from general requirements to the functional system. The result of an activity should be a principle system constituent factor. Here we rely on a theoretical proposition that the human being is a subject of activity. But what does this mean? It means that any human being possesses needs and abilities to want and to wish. He or she satisfies given volitions in an activity and by activity. Depending on the needs and wishes, the person as the subject of an activity sets him/herself a goal that, as we see, is a goal of his/her activity. The main components of activity subjectness are presented in Figure 3.

Figure 3

Components of Activity Subjectness



One of the significant features of activity subjectness is the relationship of the major components with experiences. This relationship reflects the methodological principle of the unity of knowledge and experiences. In the case of conscious division of labor the given components are associated with each other by establishing diverse and multivalued relationships. The result of any activity is characterized by productivity, quality and reliability. Therefore, a normative result is always transformed under the influence of these three parameters. The subject being differentially motivated might prefer one of them. In this sense decision making is filled with deep experiences. Productivity may always be improved at the expense of quality and reliability. The rate of salary payment is often related to productivity, while decreased quality means defects in work, and low reliability may cause unfortunate results (accidents, damage, and loss of human life). The orientation to a set of parameters defines the psychological value of an activity.

In a complex relationship of normative results and motives of the subject's activity, the goal of this resulting activity is established. The goal-motive ratio determines the *personal meaning of an activity for the subject*. Here an external social estimation of the result (which is attained by the subject) is a very important point that determines the character of the relationship of activity result, motive and goal. Results in sport are an example of social estimation. The motivation in choosing and adopting an activity is closely related to external estimation.

Motivation and external estimation of an activity define the hierarchy of basic parameters of the subject's activity. The acceptance of one's occupation, the identification of the personal meaning of an activity, the normative result transformation and the choice of ways to achieve it are influenced by the subject's motivation. Under the influence of motivation and the goal of an activity, resources of a person's inner world get involved in its diversity. This is based on the functional principle. It becomes possible because motivation has been part of all the components of a person's inner world when they were formed through past experience.

Motivation influences the determination of criteria for achieving goals and for *preferring* a goal modification and the ways of attaining it. Here it should be pointed out that the processes of motivation and the interaction between results and goals have been not adequately studied. To achieve a goal, the subject has to perform some actions. The subject's activity is directed by the concept of a result (goal) and its *program*. At the same time it is necessary to deconstruct the goal into subgoals of separate actions, and for each subgoal the criteria of the goal, achievement and preference should be defined. They are defined in the processes of decision making.

In the *activity program* the subject establishes how and when he or she is going to act, and what action to perform in order to get the prospective result. This program is based on the subject's motivation, his/her result concept that is the reflection and the assessment of objective and subjective conditions. Therefore, the activity program is formed by motivation, result concept, reflection and assessment of objective and subjective conditions matching current results of an activity with normative modes of action and conditions that lead these actions to realization.

The activity program is developed based on decision making towards each parameter. Decision making is involved in every component of an activity. The activity motivation is determined as a result of decision making. And here we have come to the understanding of:

• what should be considered in the subject's wishes (the motivation that is maintained by decision making about the dominant motives; this is known as conflicting motives);

• what result should be obtained with due regard for the subject's activity motives and conditions (the concept of a result is specified with criteria for the goal achievement and preference, in turn the activity result concepts are deconstructed in subgoals of separate actions in accordance with corresponding criteria);

• what the interaction of separate actions within the structure of an activity and their contributions to it are, and which program should perform these processes.

Decisions are made within the "field of choices" for each component of an activity. The entire program is fulfilled by the subject with due account taken of his/her personal traits: ability, volition and potential of a person's inner world.

The general architecture of the activity psychological functional system (APFS) is presented in Figure 4. The proposed architecture is close to the general architecture of physiological functional system suggested by P. K. Anokhin (1975). But for all that the APFS in its components and the relationships between them is filled with a new content that is primarily determined by human mind.

Having defined the activity structure we could focus on another key issue that concerns the interrelation between activity and ability structures. The activity structure multiplies in the actions" structure uniting them with a single motive and goal. Each of the action structural components is filled with the content and pooled by a single motive and goal into an integrated activity structure (see Figure 5).

In a sense of understanding that any activity is realized through human abilities, the issue of the role of abilities within the activity structure should be of special interest. To initiate an action one has to:

• comprehend (perceive) a situation where the action is going to be done;

• retrieve from memory the information related to the action (knowledge, plans and behavior structures, abilities and skills);

• imagine the way in which the action could be done differently;

• assess the whole set of information gained by the subject of an activity;

• make a decision about activity implementation with due regard for the motivation and normative mode of an activity, normative requirements;

Figure 4

General Architecture of the Activity Psychological Functional System

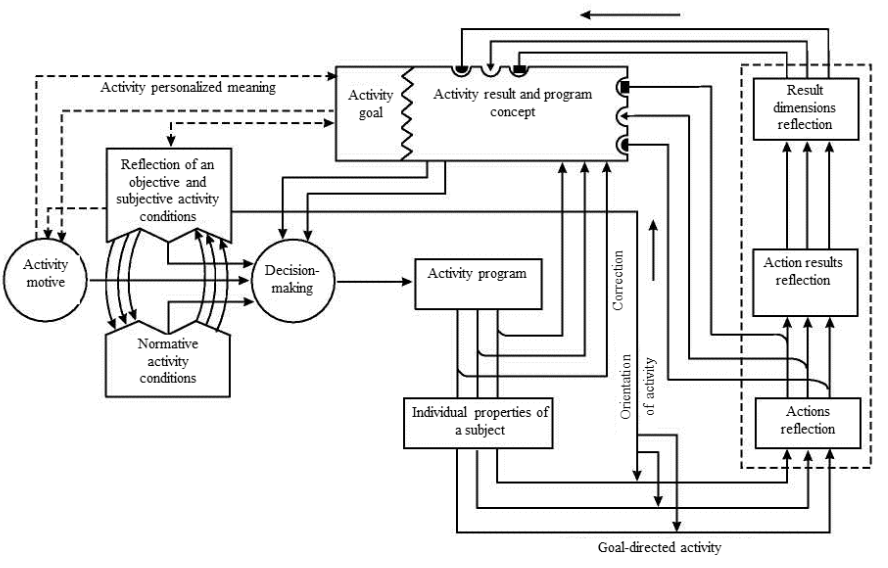
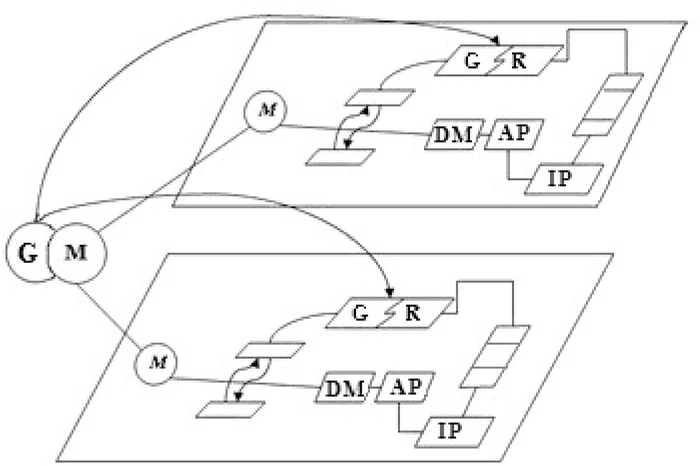


Figure 5

Multiplicated Activity Structure



Note. G – Goal, M – Motivation, R – Result, DM – Decision Making, AP – Activity Program, IP — Individual Properties of a subject.

- develop a program to implement the action;
- do everything necessary to implement the actions (intellectual, sensorimotor);
- match the result with the goal concept;

• make a decision about the activity completion or program correction (the latter has to repeat all the steps specified above).

Therefore, each of the considered mental processes relies upon specific abilities of:

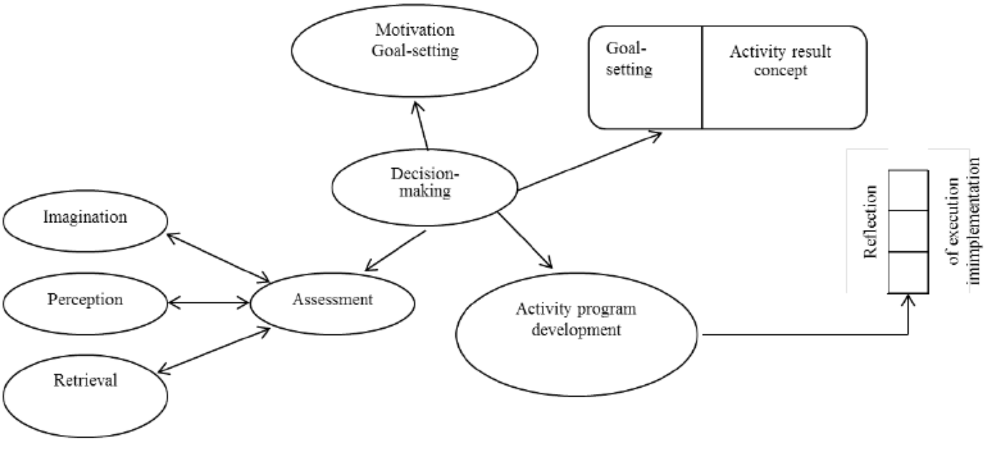
- perception,
- imagination,
- memory,
- thinking,
- sensorimotor.

The generalized activity functional system is shown in Figure 6. Here we should note that the abilities are not similar to the mental functions. They function in close interaction.

Abilities are considered to be a mechanism of facilitating activity. Involved in activity they are aligned with its requirements while developing in activity by acquiring operational features. General abilities are completed by programs that use them with a focus on a specific activity in compliance with conditions for implementing the activity and the goals to be achieved. The more activities general abilities are involved in, the more the programs for their application diversify. That is the mainstream of ability development that modern diagnostic methods have not addressed. The research in occupational psychology (Shadrikov, 1982; Shreider, 1979, 1980) clearly brings out that activity success is dependent on the system-interactive set of abilities. The data shows that there are correlation pleiads of abilities that provide for the efficacy of implementing single acts within the activity structure and determine the productivity, quality and reliability of that activity. The same abilities might be involved in different subsystems while their operational manifestations can be similar or varied. Therefore, any activity can be described (as viewed from the position of a system of abilities to implement it) as a structure of abilities with constant alterations in its composition and the extent of interaction, with each ability possessing a specific operational manifestation. In the

Figure 6

The Activity Functional System at the Ability Level



multitude of abilities that implement activity there is a unique activity structure that is multiplied in the structure of separate abilities. This unique structure is ontologically actualized by the brain as the organ of psyche, and is functionally determined by the motivation and goals of activity.

Finally, we would like to state that the proposed model of the activity psychological functional system is useful for describing different types of professional activity (Shadrikov, 2013) in professional training and occupational selection. The model has confirmed the efficiency of methodology based on certain theoretical grounds in regard to purely empirical approaches. The observed model in fact is developed in work and this process is considered as a process of activity system genesis.

Conclusion

It is generally known that psyche emerged to ensure the survival of living organisms, and its development has been associated with the increasing complexity of the environment. In humans, the leading form of active life is activity. The psyche is fully manifested in activity; human beings develop through activity. Without addressing the category of activity, without revealing the essence, it is impossible to unite the fundamental problems of psychology. The activity paradigm formed the basis for the studies of L. S. Vygotsky (1982) into the development of methodological problems in psychology; S. L. Rubinstein (1946) in analyzing the structure of activity and its significance in studies of the fundamental problems of the psyche; A. N. Leontiev (1972) in the development of methodological foundations of modern psychology; D. A. Oshanin (1999) in the study of the objective action and the formation of the operational image; K. A. Abulkhanova-Slavskaya (1973) in the development of the problems of the subject of activity; G. S. Nikiforov (1988) in the study of problems of self-control in activity; and O. A. Konopkin (1980) in research into the problems of the regulation of activity.

The study of activity enables the construction of bridges between different schools and directions in psychology, and contributes to the development of meaningful psychological methodology (Mazilov, 2002).

The model of the psychological functional system of activity proposed in the present work has been successfully used in the works of A. V. Karpov (Karpov, Shadrikov, Karpova, & Subbotina, 2017) in developing the problems of play activities; N. V. Nizhegorodtseva (2004) in the study of learning readiness; Yu. P. Povaryonkov (2013) in considering the problems of the psychology of the professional formation of the personality; and N. P. Anisimova (2006) in the study of problems in goal setting.

We hope that the various approaches presented in this paper aimed at the methodological, theoretical and practical analysis of activity will contribute to the development of the activity paradigm and the quality of practical research.

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Теория деятельности: функциональная система и способности как механизм реализации деятельности

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Резюме

Теоретический обзор работ классиков в области психологической теории деятельности показывает, что деятельностный подход глубоко и всесторонне разработан отечественными психологами и обоснованно приобрел статус научной парадигмы. Предложенные в рамках деятельностного подхода концептуальные модели деятельности нашли свое применение к решению прикладных задач в различных исследовательских программах. Не без основания можно утверждать, что у деятельностного подхода в психологии не только богатое прошлое, но и перспективное настоящее и будущее. В настоящем исследовании обсуждается общая структура психологической функциональной системы деятельности, которая соотносится со структурой физиологической функциональной системы, предложенной П.К. Анохиным. Однако в своем компонентном строении и взаимосвязями между этими компонентами она наполняется другим содержанием, которое главным образом определяется человеческой психикой. Вопросу о месте способности в этой структуре в настоящей работе уделяется особое внимание. В своем исследовании мы показали, что изучение деятельности с позиций системогенеза позволяет понять сущность процесса развития человека и способствует пониманию взаимоотношений между деятельностью и развитием, а также позволяет раскрыть роль способностей в реализации деятельности и понять механизмы развития отдельных действий. Показывается, что способности выступают в качестве механизма реализации деятельности и что деятельность можно представить с позиции реализующей ее системы способностей как постоянно меняющуюся по составу и мере взаимодействия структуру способностей, каждая из которых имеет свое оперативное проявление.

Ключевые слова: способности, психология деятельности, психологическая функциональная система, операция.

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