

SYNCHRONIZATION AND CONTINUITY OF ACTION

Yuri K. Strelkov

*Lomonosov Moscow State University
Moscow, Russia*

Is there any future for the activity approach? Has it exhausted its potential yet? We suggest the scheme of “subject-action-object-surrounding world” instead of “subject-activity-object”. This scheme takes us beyond the limits of a singular action where the accent is laid on synchronization with one of the processes in the world around. The time coincidence is to be realized, and the subject foresees it. The subject referred to is a group of people performing a united action. Thus we oppose a singular action to interaction of individuals in cooperative action amidst processes taking place in the world around and within a variety of other actions. We found it useful to extend the concept of activity and to speak of the life-activity, embracing many vital processes of individuals or groups engaged in a certain activity.

Keywords: time, synchronization, action, humanitarian approach.

The constructing material for this theory is contributed by investigations in human labor in high-technology systems (aircraft and ship control, maneuvering of the locomotive which pulls a train set of cars, driving a modern car in the road flow), orchestra conducting, performance of an orchestral part, sporting activities (diving, high jump, long jump, synchronous swimming, sport games – basketball, football).

Humanitarian approach employs the following methods: interview, interrogation, labor method, construction, modelling and experiment in laboratory and at simulators, projective techniques. There appeared a number of new books, written by T.V. Filipieva (2011), I.V. Gerasimova (2009), Yu.E. Yakunina (2011).

Labour methods

There have already been issued books compiled on the basis of the author's acquired experience of work in aviation. He worked as a pilot (Pchelinov, 1993), and as an air-hostess instructor (Filipieva, 2011). Many other psychologists fulfilled professional activities along with workers and engineers while preparing their theses. Thus, A.N. Gubanov, a skillful bone-carver, accomplished a thesis dedicated to the bone carver's image of the world. N. Bondarchuk worked with a brigade of gold prospectors (2007), O.A. Istomina – onboard a fishing fleet ship (2007), O.A. Garanina (2006) – with an Ambulance Unit, I.V. Gerasimova (2009), A.V. Sheverdina (2006), M.Yu. Orlova (2008), S.A. Danchenko (2003) conducted psychological assistance on sea crafts).

The labour method allows conducting systematic observations over the process of the work conducted by the subject and other people. It also helps to grasp the meaning of the process under monitoring, to master the professional language and discuss details of the work process with one's colleagues specializing in it. Their interviews become more profound and so can focus on subtle and complicated nuances of the process.

Modelling

Against this background there stands out the work of V. Nazarenko accomplished on the basis of a computer model. The study was arranged as follows: aircraft captains with a considerable standing of flawless performance were to carry out simulation exercises, including flying-off and land approaches in severe environment, e.g. with three (out of four) malfunctioning engines. The work helped improve the model, and the training was claimed as well profitable for the captains who obtained a new piece of experience in handling various complicated tasks.

There have also been conducted a number of novel studies employing the naval simulator training. Captains and navigation officers of marine vessels took part in the experiment. The task was to exercise the operation in emergency situations. The observation method was introduced to study psychological content of vessel traffic management operators. The method of conversation was used to study the work of marine pilots.

The experiments were conducted with the electronic device Hro-noscop-2006, developed and constructed by the psychologists of our academic department (Bespalov, Strelkov & Leonov, 2006).

The device gained an extensive use in sport psychology and was highly estimated by sportsmen and their coaches (hockey, synchronous swimming, judo).

The projective technique ("Draw the Time") in various versions was used in the works of E.V. Shilova (2006), A.V. Vecherin (2007), O.A. Istomina (2007). Drawings can reveal a personality behind them or hint at some complicated circumstances the subject finds himself in. All this may yield conclusive psychological data. The experts were called to analyze the drawings. They were supplied with the key signs to classify the drawings. Thus, the ways of qualitative interpretation have gradually been developed.

The humanitarian approach results in some practical contribution. Training procedures, which were given a trial in these studies, proved their value for various activities: airhostess work onboard the aircraft (Filipieva, 2011); for rotation workers in the high north (scientifically grounded time schedules of work and recreation were accomplished by N.N. Simonova); methods and schemes of investigation of air crashes and industrial accidents. Criteria and parameters of psychological assessment of professional activity are in the focus of current studies (Yakunina, 2011).

Psychology is a humanitarian branch of science. Why should we consider the question of the humanitarian approach then? Labour psychology and engineering psychology emerged and developed to address practical interests of industrial production, transport, military arts, etc. Practical life (its economic, political, military spheres) required not just improvement in efficiency of soldiers, operators or workers, but demanded accuracy, speed, and reliability of performance. The main instruments of applied psychology used to be selection and training. The humanitarian approach translated the focus from information processing and microstructural analysis of activity to the issues of professional experience and mastership, interaction and dialogue, the world image and the way of life of a professional.

Essentially, the humanitarian approach is concerned with people, not only their interactions or joint actions, but also human relations, empathy, sympathy, assistance and cooperation (Strelkov, 2005). Another aspect of paramount importance for the development of the humanitarian approach was the study of philosophic foundations of the concept of time.

Time. General assumptions

The definition runs as follows: “time is a measure of movement.” But this will not suffice. We proceed from the extended definition reconstructed by M. Heidegger from ancient texts (Heidegger, 2001). Time is a measure of movement: it is applied by a subject who perceives the process now, at the present moment, which lies somewhere between a certain moment in the past and another one in the future. This definition suggests that the application of measure should not come *per saltum* (in a single step), it should embrace an interval containing points singled out against the past and the future, and identify the role of a subject. Thus, the definition indicates the inseparable nature of the subject and time.

Bergson introduced the notion of ‘pure duration’ based on consciousness, memory, and freedom (Bergson, 1992). E. Husserl studied phenomenology of inner awareness of time. M. Heidegger formulated theses of “exstatic time”, of “the time timing the world from the future”. He defined the following properties of “temporality” – duration, time-liness, meaning attributing, publicity. Further development of general propositions was endeavoured in the works of M. Merleau-Ponty (1999), Jean-Paul Sartre (2002), Gilles Deleuze (2000), M.N. Trubnikov (1987), M.K. Mamardashvili (1997), and others.

Most important for our study is the concept of “temporal synthesis” examined by Gilles Deleuze (2000) in respect to habits, perception and memory, and also the concept of “active and passive synthesis” developed by Merleau-Ponty (1999).

We should take as a premise the understanding of relations existing between time and language. In our research, the language provides a more profound basis: a dictionary may suggest a set of terms signifying temporality – the present, past, future, duration, sequence, simultaneity, speed, rhythm, term, beginning, end, movement, change, period, etc.

Each notion signifies a qualitative characteristic of the process. The end differs from the beginning, sequence from simultaneity, the future is distinguished from the present or the past, term differs from rhythm and tempo. This set is used to study and describe processes. Looking closely at the variety of movements or changes, which we examine with the application of time, we can discern a number of stable lines with recurrences. We call these lines ‘processes’. The word “pro-

cession” would serve a closely related and clear example. Other examples, like the performance of a musical composition by a symphonic orchestra, aircraft or ship control, train (or another transport vehicle) control, sport games (basketball and hockey) would also stand for that matter. The process is maintained in accordance with rules and cultural norms.

Temporal form

The temporal form is constructed upon the basis of time-related terms. Their variety and qualitative heterogeneity reveals complexity of the temporal form. The temporal form possesses a longitudinal structure. Duration, synchronization, temporal synthesis constituting this temporal form is structured along the processes where the subject is incorporated. Processes may have different directions but there are some definite priorities and results. Here again we come across the principle of a flow. Duration indicates a process but the process cannot be regarded without a subject.

Duration refers to a depth of the temporal form; a synchronous state, in its turn, indicates a multitude of lasting processes. If we imagine them as coplanar lines – like river arms in the estuary – then we can speak of the extensiveness of temporal form. The idea of a hierarchy within the temporal form comes when we consider a multi-level organization within the system of processes, which represent the subject’s activity in a situation. Processes, local and global, taking place in the near and far-off environs, demonstrate distinctions, which may provide the basis for a hierarchy within the temporal form.

To explicate the idea of M. Merleau-Ponty (1999), we can assert that time is a multidimensional net of intentionalities. If we take a notation of a musical composition as an example, upon the face of it, the score strictly determines actions and even movements of the musician though it still admits individual interpretations. The temporal form can be represented in micro and macro scales. The score sets up the rhythm, time values and synchronization; but the composition may be performed in a number of different ways. The subject makes a synthesis of the temporal form out of the processes both carried out and staying out of control of the subject (one has only to perceive them, track or adapt to them).

Time and process, measure, form of the process. Multitude of actions

The relation of time, language and interaction is most clearly shown in the work of E.V. Shilova, where she studies the international teams on naval ships (Shilova, 2006). Anticipation and memory, attention, perception and thinking come as a psychological reverse of movements. Any action is aim-driven, motivated, and sensible (A. Shchjuc (2004), E.C. Tolman (1932)). Psychological characteristics of an action are not the only matter of importance. One should reveal the role of the subject.

Subject relatedness of the temporal form

Why is the temporal form subjective? The subject retains this form by a conscious effort (Mamardashvili, 1997). The temporal form depends on the subject's motivation. Relation of time and motivation is also supported by the assumption of intentionality of duration. If the subject's efforts are weakening due to fatigue or loss of motivation, then the time form will be distorted. The temporal form may be incomplete and even abrupt, as it was demonstrated by the studies N.A. Litvinova conducted on the group of state employees (Litvinova, 2011). According to A. Bergson, duration is a form assumed by the succession of states of our consciousness, when our "Self" just lives. This is a unity, organization, and a shared nature of the states of consciousness; it is the temporal synthesis. This definition binds human consciousness, personality, memory and life in a tight knot.

Temporal form of action

According to E.C. Tolman (Tolman, 1932), action is integral, selective and based on the cognitive map of space. Let us extend this conception. Action has a temporal framework, it cannot be stretched or squeezed infinitely; it has its beginning and end, it has duration. Duration is experienced by the subject. Any action possesses some inner rhythm; each part of the action is characterized by its own tempo of performance. Application of temporal terms takes us beyond the limits of a singular action. In order to time the action with other processes the subject must possess their map. But the map itself is dynamic since the very action, and the processes are mobile.

Temporality presents a specific view of the action and suggests a definite answer to the question of how it exists at the present moment.

Is it functioning as a neat and harmonious system of actions, gradually leading to a well-defined result; as a flow of stirring chaotic movements or as periods of strained immobility?

The action immediately manifests itself in the movements comprising it. It is represented as a change, a passage from the beginning to an end. Temporality does not only consider actions as they are accomplished by the subject, it also requires the introduction of an observer with a trained eye able to grasp the meaning of things observed, both actions and their constructing parts. We find it necessary to speak of the structures of experience. Only specialists with sufficient experience can bring the action to its successful termination. This means that one should not regard experience exclusively in the domain of actions, considering its structures, we should connect it with the subject treated *per se*, apart from the action. It is the subject's potential, which remains invisible during inactive periods and then comes out in the process of performance to manifest itself in the qualitative part of the result achieved.

Actions and mistakes

Mistakes made by a professional as well as accidents were studied by E. V. Shilova (2006), Y.K. Strelkov (Strelkov & Strelkova, 2005). Our work is directed at solving a practical task of removing delays. Temporal mistakes make a topic that will always remain urgent. In its positive interpretation the practical task takes the following shape: we must assure that people shouldn't be late, that they should have time to terminate the action before the appointed deadline and to follow the action rhythms of the other workers, to keep up with the required rhythm in their actions. For example, a well-timed stop of a railway locomotive pulling a heavy train set of cars.

It is necessary to teach one to plan one's actions, to make use of temporal resources. It is essential to prevent temporal mistakes of another type – those of hasty actions.

Premature actions cannot only be vain, useless, but also dangerous and harmful.

Investigations conducted on aviation, marine, and railway accidents revealed how complicated the bundle of circumstances bringing forth an accident may be. More often than not it is almost impossible to reliably establish the real cause, although in practice the guilt is often laid upon one person.

The temporal form of experience, and a world image

The temporal form embraces a great variety of processes unfolding around the action.

The subject retains the Form by a conscious effort. The concept of “retaining” here embraces the subject’s action performed by means of displacements together with perception, attention and even thinking. Obviously, the efforts, as well as the processes of retaining, will be different for perceptual retaining and that of motor action. The amount and experience of such retaining will differ as well.

The temporal form has its energy, which differs from that of the subject’s action.

The structure of experience

According to A.N. Laktionov experience coordinates include life-activity and individual world, social, personal and mnemonic layers of experience, dynamics and subject relatedness (Laktionov, 1998). Memory is a process of self-organization of experience (Sereda, 1985). Observing the action performed by an experienced professional, we promptly mark its inner organization and structure.

The following questions constitute the matter of our primal interest: how does this structure come to being? How is it consolidated from one performance to another? How is it maintained without practice? What causes lead to its destruction? What is the role of language in formation and improvement of the experience’s structures? While experience is improved the person masters the language, which describes the actions. Language and actions are interrelated through the structures of experience. In what way do cooperation, sympathy, shared emotional experience of the Significant Other person help to mould, keep, and restore the experience? They are important for the experience formation.

The temporal form of the action performed by an experienced specialist corresponds to the temporal form of the processes but they are not identical. One may compare performance of a musical part by one of the violinists with the performance of the whole orchestra, or we may take a composition performance during the rehearsal (without the audience) and in presence of spectators, who may listen with utmost attention, or behave aggressively, or remain completely indifferent. How does the experience of synchronization and the duration

holding appear? Which role does the motor sphere play in duration keeping? These are the questions addressed in the work of S.V. Leonov (Leonov, 2008).

Activity and life-activity, according to P.I. Zinchenko. How do they correspond to the image of the world?

A world image

The world is a variety of processes, which lie beyond a situation but at a certain moment of time may intercross with the action, taking place in the situation. Description of processes taking place in the world will require the concepts of space and time which, to our mind, can be in no way combined and represented in a four-dimensional frame. K. Lynch introduced the triplet of space-time-meaning to describe the image of a city. For the description of transportation processes the notion of energy is rather essential.

Such a considerable linguistic potential is employed by all scientists; and it cannot be narrowed down to the system of meanings or signs. When a world image is considered, it becomes quite obvious that time, space, language and energy are pulled together in a tight knot. Thus the basic scheme becomes 5-dimensional, that is, space-time-energy-language-meaning. Theoretical and empirical studies of Y.K. Strelkov (2010) concerns the issues of temporal coherence of the professional's image of the world. A.S.Vlasik studies the dynamics of temporal coherence recovery of the professional experience after a psychic trauma.

The image of the world is a broader concept than perception. It lies close to the concept of consciousness and the knowledge system. The sailor's image of time and space was studied in works of M.Yu. Orlova (2008), O.A. Istomina (2007), which contributed to the collection of "Essays on naval psychology". The naval psychology is a new term uniting a number of studies belonging to psychologists in Vladivostok. There were investigated peculiarities of the subject's perception of a moving object, when the subject is being placed in another moving object (Strelkov, 2010).

Conclusions

The activity approach does not pay sufficient attention to the content difference among the processes. It is equally indifferent to the content of knowledge the subject possesses. It can be applied to the action already

performed and is always the same however peculiar the content of the activity may be. The concepts of the temporal form, mastership, subject's experience and image of the world help, at least partially, remove these deficiencies. The temporal form includes many processes, in which the subject's activity is incorporated. It is essential that a great amount of them develop outside the subject and the action, independently of them. Unable to influence them through his action, the subject can only monitor these processes, adapt to them, and synchronize with them, taking safety measures.

The experience structure revealed behind the subject's action performed in a definite situation corresponds to the temporal form of the processes covering the activity of the subject, but these are different concepts referring to different objects. One of them refers to a number of processes going on in the world; the other does so to the structure of the action performed by the subject.

A world image contains global and local processes represented to the subject. The image of the world suggests a definite opinion of the human knowledge system constructed with concepts of space, time, language, and personal sense. A world image brings together the activity and knowledge of the subject. These are not only traces of the past activities but also a complex of perceptions, recollections, ideas, anticipations, and prognoses related to the current action. Their content bears a specific nature of the current activity. Many instances of this content are represented in a world image, but not all of them are given to the subject's consciousness.

Acknowledgments

The work was supported by Russian Foundation of Basic Research № 10-06-00552-a.

References

Bergson, A. (1992). *Opyt o neposredstvennykh dannyykh soznaniya* [The experience of the immediate data of consciousness]. In A. Bergson, *Sobranie sochineniy* [Collected works], vol. 1 (pp. 55-155). Moscow.

Bespalov, B.I., Leonov, S.V., & Strelkov, Y.K. (2006). "Khronoskop 2006" – psihodiagnosticheskiy pribor dlya izucheniya vremennykh kharakteristik dyeyatel'nosti

cheloveka ["Chronoscopes 2006" – psychodiagnostic tool for studying the temporal characteristics of human]. In *Materialy I Mezhdunarodnoj nauchno-prakticheskoy konferencii "Lichnostnyj resurs subekta truda v izmenjajushchejsja Rossii"* [Materials of the First international scientific-practical conference "The personal life of the subject of labor in a changing Russia] (pp. 49-50). Stavropol'; Moscow.

Bondarchuk, N. (2007). *Psikhologicheskoe sodержanie staratel'skogo truda* [The psychological content of artisanal labor]. Avtoref. dis. ... kand. psihol. nauk. Magadan.

Danchenko, S.A. (2003). *Professional'naya i religioznaya napravlenost' v strukture lichnosti moryaka* [Professional and religious orientation in the structure of seafarers]. Moscow.

Deleuze, J. (2000). *Kriticheskaya filosofiya Kanta: uchenie o sposobnostyakh. Bergsonizm. Spinoza* [Kant's critical philosophy: the teaching of skills. Bergsonism. Spinoza]. Moscow: PER SJe.

Filipieva, T.V. (2011). *Psihologija bortprovodnika* [Psychology of flight attendant]. Moscow: Energija.

Garanina, O.A. (2006). *Osobennosti organizatsii vremeni zhizni spetsialistov, rabotayushchikh v rezhime smennogo grafika* [Features of the lifetime of the organization for professionals working in the mode of a replacement schedule]. Avtoref.dis. ... kand. psihol. nauk. Moscow.

Gerasimova, I.V. (2009). *Psikhologicheskoe sodержanie dyeyatel'nosti operatorov dvizheniya sudov* [Psychological content of the operators of traffic]. Vladivostok.

Heidegger, M. (2001). *Osnovnye problemy fenomenologii* [Basic problems of phenomenology]. St. Petersburg: Vysshaja religiozno-filosofskaja shkola.

Istomina, O.A. (2007). *Motivatsiya truda moryakov v dlitel'nykh rejsakh* [The motivation of seafarers on long voyages]. Vladivostok.

Laktionov, A.N. (1998). *Koordinaty individual'nogo opyta* [The coordinates of individual experience]. Har'kov: Biznes Inform.

Leonov, S.V. (2008). *Psihologicheskie kriterii otsenivaniya vremennykh intervalov v professional'noj dejatel'nosti* [Psychological criteria for the estimation of time intervals in professional activities]. Avtoref. dis. ... kand. psihol. nauk. Moscow.

Litvinova, N.A. (2011). *Vremennaya organizatsiya dyeyatel'nosti gosudarstvennykh grazhdanskih sluzhashchikh* [The temporal organization of civil servants]. Avtoref. dis. ... kand. psihol. nauk. Moscow.

Mamardashvili, M.K. (1997). *Kantianskie variatsii* [Kantian variations]. Moscow: Agaf.

Merleau-Ponty, M. (1999). *Fenomenologiya vospriyatiya* [The phenomenology of perception]. St. Petersburg: Nauka.

Orlova, M.Y. (2008). *Aktual'nost' psihosotsial'nogo podhoda dlya sovremennoj psihologii truda* [The relevance of psychosocial approaches for the modern psychology of labor]. Vladivostok.

Pchelinov, A.F. (1993). *Vremennye faktory destabilizatsii dyeyatel'nosti chlenov ekipazhyej vozdushnykh sudov grazhdanskoj aviatsii* [Temporary factors of destabilization of the crews of civil aircraft]. Avtoref. dis. ... kand. psikhol. nauk. Moscow.

Sartre, J.P. (2002). *Bytie i nichto* [Being and nothingness]. Moscow: Terra.

Sereda, G.K. (1985). Chto takoe pamyat': opyt fenomenologicheskoy ontologii [What is the memory: experience of phenomenological ontology]. *Psychological Journal*, 6, 41-48.

Shchjuc, A. (2004). *Izbrannoe: Mir, svetyashchijnya smyslom* [Favorites: Peace, glowing sense]. Moscow: ROSSPJeN.

Sheverdina, A.V. (2006). *Osobennosti professional'noj dyeyatel'nosti morskogo lotsmana* [Especially professional activity of marine pilots]. Avtoref. dis. ... kand. psihol. nauk. Moscow.

Shilova, E.V. (2006). *Vremennoj faktor v organizatsii dyeyatel'nosti mezhdunarodnyh ekipazhyej* [Time factor in the organization of international crew]. Avtoref. dis. ... kand. psikhol. nauk. Moscow.

Strelkov, Y.K. (2010). Vremennaya forma professional'nogo opyta [Temporary form of professional experience]. *Vestnik Moskovskogo Universiteta* [Moscow University Bulletin], Ser. 14 – Psychology, 2, 23-31.

Strelkov, Y.K., & Strelkova, L.P. (2005). Gumanitranij podkhod v psihologii truda [Humanitarian approach in the psychology of labor]. In *Prikladnaja psihologija kak resurs social'no-jekonomicheskogo razvitiya sovremennoj Rossii. Materialy konferencii* [Applied Psychology as a resource for socio-economic development of modern Russia. Materials of the conference] (pp. 383-384). Moscow: Russian Psychological Society.

Tolman, E.C. (1932). *Purposive Behavior in Animals and Men*. Berkeley: University of California Press.

Trubnikov, N.N. (1987). *Vremya chelovecheskogo bytiya* [Time of human existence]. Moscow: Nauka.

Veherin, A.V. (2007). *Dinamika predstavlenij o rynke truda na rannih etapah stanovleniya professionala* [Understanding of the dynamics of the labor market in the early stages of becoming a professional]. Avtoref. dis. ... kand. psihol. nauk. Moscow.

Yakunina, Yu.E. (2011). *Kriterii I parametry psihologicheskoy otsenki professional'noj deyatel'nosti* [Criteria and parameters of psychological assessment of professional activity]. Magadan: Kordis.