

Prospects for development of L.S. Vygotsky's ideas in clinical psychology

Aleksander Sh. Tkhostov

Faculty of Psychology, Lomonosov Moscow State University, Moscow, Russia

Corresponding author. E-mail: tkhostov@gmail.com

This work is dedicated to the development of L.S. Vygotsky's ideas in clinical psychology and the clarification of some basic points of the cultural-historical concept. The paper presents a thesis about the development of man in ontogeny as the result of his interaction with the cultural environment, which transforms natural mental functions into higher mental functions. This process can be attended by a whole range of psychopathologies. The issues discussed include voluntary regulation of higher mental functions, determination of the involuntariness and "post-voluntariness" of functions, the internalization of actions, the differentiation of affect and emotion (including as higher mental functions), the "cultural" socialization of non-mental functions (sex, sleep, excretion), and the discord between natural and "cultural" entities in a person. The basis for the ontological development of man is the genesis of "subjectness", like all the forms of higher activity that emerge when encountering cultural restrictions and requirements causing specific mental disorders. The supposition is made that there are no significant restrictions to explaining either mental or non-mental functions with the cultural-historical approach. Recommendations for further research are suggested.

Keywords: cultural-historical concept, development in ontogeny, voluntary regulation, internalization, higher mental functions, a "cultural" body

While schematizing the classical concept of higher mental functions in order to present its key points, we affirm that human development itself is a result of a person's interaction with his cultural environment. This transforms innate, natural mental functions into higher mental functions, through the child's adoption and subsequent internalization of special tools that are social in origin. These are formed in direct contact with an adult, through interpersonal (shared) activity. This interpersonal activity is actualized in an object-centered, real form, but internalization turns it into a concealed, unobserved form, mediated by a psychological tool — a sign — not directed at external objects at first, but rather at control of other people, and then also of the child's own behavior. The principal differences between higher mental functions and natural ones consist in the capacity of the former for self-regulation; their lifelong generation, social origin, the mediation of their formation

by a psychological tool or sign; their voluntariness; and awareness that is achieved by their functioning; their hierarchical and systemic nature (Luria, 1969).

The distinction between the hierarchical positions of lower (natural) and higher mental functions is primarily because there is a new intermediate element interposed between the stimulus (toward which behavior is directed) and the person's response. Behavior loses its unmediated character, and the unity of stimuli and responses is disrupted. The scheme of the formation of higher mental functions introduced by L.S. Vygotsky (1982) has been reproduced with almost no alterations in later psychological works following his cultural-historical approach, although some of its basic theses require clarification.

The problem of voluntariness (or in its philosophical meaning, "volition") remains especially unclear, and has been one of the most difficult things to explain throughout the history of philosophy and psychology. Voluntariness still has no unambiguous meaning, as there remains the absolutely unintelligible moment of joining the incorporeal substratum of will to a material body. Any possible solution faces the unsolved psychophysiological problem. A possible way around it that Vygotsky uses is the idea of sign-symbol mediation — a universal instrument adopted during ontogeny, which enables one to master one's own behavior by mastering the stimuli controlling that behavior. This idea, borrowed from Hegel, was intended to explain the possibility of affecting real behavior by means of the incorporeal substratum of will. Hegel employed the metaphor of the "cunning" of reason, not interfering with the actions of natural forces, but allocating them in a sequence that corresponds to the will of the subject, without any violation of natural laws (Hegel, 1997). For instance, the existence of an airplane in no way violates any law of nature; however, there are no airplanes in nature: They are the invention of humankind. Though there is no "natural airplane", the machine was invented in full accordance with laws of nature (and these laws allow it to function, so that human beings can perform an act incompatible with their nature: to fly). Although the laws of nature are not violated, the result is a completely unnatural event. A real stimulus, which later on evokes the required behavior, may be replaced by its semiotic copy or signifier, thus representing the stage of transition to sign-symbol mediation.

This is what Vygotsky considers a specifically human invention, although, as Hegel does in his metaphor of the "cunning" of reason, Vygotsky underscores that there are no cultural practices that could not be separated into their constituent natural processes. The principal limitation of that explanation is that releasing the will from the necessity for material effort does not completely clarify the problem of choice: After all, the problem is not that the will is unable to lift a stone, but that muscular strength is needed to do it. Force ceases to be measured in kilograms, but it remains unclear how the will may be determined, and whether there is a doubling or even tripling of substance: If voluntariness is determined by the use of a psychological tool, how is its usage to be determined? In an attempt at a non-contradictory solution of the problem of voluntariness, placing it in the most developed form of the cultural-historical approach, A.R. Luria had to resort to verbal gymnastics in the genre of dialectical materialism: "Rejection of the idealistic notion of higher mental functions as the manifestation of some spiritual principle detached from all other natural phenomena, as well as rejection of the naturalistic approach to it as natural properties inherent in the human brain, may be considered the main achievement of modern psychology" (Luria, 1969, p. 142). Later, in the absence of meaningful

discussion of the problem of voluntariness, this idea in neuropsychology transposes itself into the problem of cerebral localization of voluntary functions: "The mechanism of voluntary regulation of higher mental functions can be regarded as the substantive principle of cerebration whose violation causes a whole set of defects, or 'frontal lobe' neuropsychological syndrome. Observations and special investigations show that the voluntary speech regulation of higher mental functions is related predominantly to the functioning of the left frontal lobe" (Khomskaya, 2005, p. 223).

In Vygotsky's cultural-historical conception, voluntary control is achieved through internalization of externalized object-centered activity by means of its mediating sign. One of the notions here requiring clarification is the idea of internalization. Despite widespread usage of this term, its specific mechanism remains quite mysterious. Literally, internalization is a transposition inwards of that what has been outside, but it is impossible to compare it to something like swallowing or putting something external (what in particular?) into one's head, brain, or psyche (what?). Comparative analysis of the usage of this term shows a difference not only in the theoretical understanding of the phenomenon of internalization, but also in defining the range of the phenomena that relate to it. This fact makes us presume that the term "internalization" implies several different notions more or less linked to one another, and frequently combined uncritically (Senyushchenkov, 2009).

One can attempt to illustrate the mechanism of internalization by addressing the most elementary instance of internalization of an outward object. The phenomenon of the probe can be found in the works of A.N. Leontiev and N. Bohr, but was described for the first time by Aristotle under the name of "the blind man's stick". This phenomenon, which offers remarkably rich possibilities of interpretation, enables us to understand the simplest model of the basic laws of one of the most complicated psychological phenomena, that of internalization.

Its essence is the following: when a blind man feels a surface with his stick, and a surgeon uses a probe to find a bullet in a wound, an amazing thing occurs. Their sensations are not localized at the boundary between the hand and the probe (where they should be, because the probe is a foreign body, and the hand is part of my body. The probe exerts pressure on cutaneous receptors, that is, the sensation should be localized exactly at the probe's intersection with the body), but paradoxically, at the extremity of the probe. This is paradoxical, because it turns out that the distant receptor is encompassed by the configuration of the body, becoming its extension and, as a matter of fact, becoming internalized. This internalization continues until the probe shows its "rigidity", that is, the predictability of possible changes. As soon as another person sets it in motion, or it changes its form and/or degree of subordination in an unpredictable way, it inevitably becomes externalized, and the sensation shifts to the boundary between the hand and the probe.

The most important thing here is that the boundary of localization is directly determined by the limit of autonomy and predictability, its dependence on the subject — always provided that the probe does not change its form, remains constant, and all its actions can be predicted and taken into account. In other words, the internalization of the probe in this example is its embodiment in the body scheme. It does not mean that we put it inside ourselves, but that it turns into a person's instrument, a prosthesis by means of which actions are as predictable and subject to us as our biological body's actions. Furthermore, it follows from this example that the internalization-externalization ratio is not fixed, but may dynamically change

depending on the circumstances. Our own body is not inherently internalized; in some situations it is uncontrollable and unpredictable, which feels like *alienation* (intoxication, numbness, etc.). Similarly, complex forms of instrumental extensions are internalized; they cease to be conscious, losing the possibility to be taken into account and anticipated. In this situation, internalization is nothing other than the adoption of a scheme of relations with these complex forms of instrumental extensions, of models of behavior, whereupon these extensions cease to be reflected upon, to be a phenomenon of our consciousness, but instead become unconscious.

That does not mean that they cease to exist; if circumstances change, they may be externalized again. Thus, in the phenomenon of “a stalled escalator”, which in no way differs from an ordinary stairway, a person suffers an intense sensation of motor discomfort. We have an internalized model of a moving escalator, and were prepared to adapt to its movement with a specific set of motor responses. Similar extensions include cognitive schemes, maps, measurements, grammar, etiquette, and so on. In this interpretation, internalization fits into specific meanings of this term: 1) transformation of outward, observed forms of activity into inner (unobserved) processes; 2) transformation of forms of joint (collective) activity into forms of individual activity; 3) a person’s adoption of norms, mindsets, values, etc. of a group (Senyushenkov, 2009). This also eases the transition of a material, outward action into an ideal, inner one, for it is not the action that is internalized, but its scheme. In this sense, the historical-cultural approach is in no way restricted by mental functions, and it has wide prospects for development.

However, in our present understanding of the psychological essence of internalization, cultural-historical theory’s classical statement — that higher mental function is the internalization of external activity that has become voluntary and conscious — has become controversial. In fact, genuinely internalized activity actually ceases to be conscious and voluntary, moving instead into the zone which, following N.F. Dobrynin (1938), can be called post-voluntariness. For Dobrynin, post-voluntariness is limited by the attention and is related to a loss of voluntary activity, and that becomes interesting. But this idea is much richer and it may turn out to be productive for the development of cultural-historical theory itself. If we assume that any function, after passing the stage of de-automation of its involuntary, natural realization through an unfolded, interpersonal stage, and later a conscious, reflexive, interpersonal stage, shifts to the post-voluntary level, which makes it possible to considerably simplify and optimize complex forms of activity.

Post-voluntary and involuntary functions in relation to awareness are only outwardly similar. Involuntary functions are *primarily* “transparent” (unconscious) for the subject; they may only become opaque when being acquired; they are subject to the logic of the mechanism and are described in the language of tropisms. “Transparency” (*post-voluntariness*) is *derivative*; the functions *have already become transparent* after being acquired, but their potential to become conscious is easily demonstrated in various complicated situations.

The discrepancy between the innate and “cultural” in a person creates a gap, in which there develop specific disorders related to functional and conversion symptoms. The principal chance for their realization is determined by the mobility of ego boundaries, which makes it possible to set up a specific configuration of “false boundaries”, imitating organic pathology. Although this hypothesis needs special discussion and proof, one may assume that the mechanism of formation of conversion and

dissociative symptoms is that they display themselves only in “semi-transparent” functions that are acquired (or could be acquired in principle). Movement disorders such as astasia abasia, mutism, colitis, constipation, diarrhea, enuresis, dysphagia, emesis, dyspnea, aspiration, hysterical dumbness, apraxia, deafness, functional amnesia, pseudo dementia, etc., do not occur on the anatomical or physiological level, but on the functional level, as a disorder of control, a shift in the zone of control. Indirect confirmation of this hypothesis is that there are no conversion disturbances of the hematopoietic system, i.e., the work of the liver and kidneys. The core of conversion and dissociative pathology is the failure of control over these functions on the level of post-voluntary realization (or, conversely, the introduction of latent control over previously automated functions) and a shift of the subject's boundaries from an external to an internal contour when the action becomes directed not to the object, but to the function itself.

There is a very interesting and promising field of analysis of psychological and brain mechanisms in the mismatch of possibilities to realize a function on different levels: involuntary, voluntary, and post-voluntary. Vygotsky describes a case of voluntary compensation in Parkinson's disease. “A parkinsonian patient cannot take a step; but when you tell him: ‘Take a step!’ or lay a piece of paper on the floor, he takes that step. Everyone knows how well parkinsonian patients go up and down stairs and how badly they walk on an even floor. You have to lay a number of pieces of paper on the floor in order to lead the patient to the laboratory. He wants to go, but he can't affect his motility; this system is damaged in him. Why is it that a parkinsonian patient can walk when pieces of paper are laid on the floor?” (Vygotsky, 1982, pp. 129–130). The explanation given by Vygotsky — “The system that enables him to raise his hand is now damaged. But he can link one point in the brain with another by means of an external sign” (ibid.) — is not fully clear. What does the linkage “of one point in the brain with another” through an external sign mean in this case?

A more convincing interpretation of this phenomenon is given by Luria: “Compensation for movement disorders turns out to be possible by the rearrangement of the mental processes that he used when walking. The activity is transferred from the subcortical level, where the foci of the lesions are located, to the less damaged cerebral cortex” (Luria, 1982, p. 110). However, it seems to me that there is no way to contend that walking is an entirely involuntary, purely reflex action; at a minimum, it includes directional programming; but it is more of a post-voluntary function that involves purely reflex connections, and extends further. As M.M. Bakhtin noted: “The person directing his hand to an object, of course, doesn't voluntarily direct the muscle contractions necessary for the act of grasping, but part of the movement towards the object is quite voluntary” (Bakhtin, 1928). Likewise in Jackson's example of the patient who is asked by the doctor to say “no” and says, “No, doctor, I can't say no”, we should recognize that the reflex basis of the action is fully preserved (otherwise, no such action could have been possible), but what is damaged is its inclusion in a voluntary or post-voluntary act.

The clinical picture of Gilles de la Tourette syndrome provides another demonstrative example of the discord among the involuntary, voluntary, and post-voluntary components. Luria wrote about this syndrome: “Any progress in explaining Tourette syndrome fundamentally broadens our understanding of human nature as a whole.... I don't know any other syndrome, the meaning of which is commensurable with this” (Sacks, 2006). Tourette syndrome is characterized by its manifold

obsessions, tics, echolalia (shouting obscene or sacrilegious words) in a particular situation where that is prohibited, for instance, in church. Though Tourette syndrome has a confirmed organic basis, its interest for psychology is connected with the actual moment of control: an involuntary verbal product is pointedly linked to efforts at its voluntary regulation, and through its content, to the culture. A patient with this syndrome does not simply cry out any words, but specifically those marked by the culture as forbidden.

There is one more parallel with functional conversion and dissociative disorders, which is intrusive/aggressive thoughts: when the patient has obsessive thoughts about involuntarily harming the very person he or she does not want to harm (for instance, the mother who is afraid of throwing her child out the window or stabbing the child). Although we have tried to describe the intricacies of these syndromes, showing the close connection of voluntariness, organic or functional foundations and the cultural context of the symptom formation, studying them from a psychological standpoint using the cultural-historical approach in clinical psychology seems very promising.

Situating the child in the cultural context is associated with objectification of his physical activity, physiological manifestations, and with the setting of limits. The subsequent overcoming and “enfolding” of these are also the way to socialization, the development of voluntariness, and the derived “transparency” of corporeal functions. The creation of “objects” in the path of the subject is a constantly flowing task of the new topology of the subject-object division. As to pathology, in this case it just confirms the existence of this already-concealed inner “support structure”. Different cultures and historical epochs, which ascribe specific responsibility and blame to the subject, produce various configurations of the subject-object discontinuity and, accordingly, various types of concealed structures defining the pathomorphism of conversion disorders.

There is one more point that needs clarification: the content of the interpersonal phase of the formation of the higher (non-natural) function. In the classical version, it is a shared performance, which enables the child to master forms of behavior inaccessible to him on his own. The ontogenetic history of “higher” human functions is usually explained as the aggregate of rather “vegetative” events. A little child in cooperation with an adult (as a representative and bearer of culture) joyfully assimilates new forms and modes of activity, internalizing them (to be sure, it is not always clear how) and shifting to a new level of mental functioning. Nevertheless, theoretical speculation, clinical observations, and even everyday experience do not accord very much with such felicity. Even the acquisition of simple alimentary and hygienic habits does not run smoothly, and the phenomenon of punishment itself in the broadest sense, which is fundamentally ineradicable from culture, generally casts doubt on the idea of absolute harmony of the dyad adult-child or subject-society. Eating with one’s hands is much simpler than with a fork; skating, playing the violin, and simply reading are not physiological; regulation of corporeal functions, drives, and needs requires constant and quite serious efforts. The acquisition of social and cultural norms differs little in principle from the mastery of the law of gravity through the practice of falling, and of the proper way to handle matches from a painful burn.

In current theoretical and practical research, it is extremely important to formulate and integrate a number of important concepts into the development of modern

psychology, concepts which correspond to the urgent challenges of the cultural-historical process, and, consequently, to the goals of psychological theory and practice. We need to clarify the very concepts of “violence”, “effort”, and (to be more precise) their interrelation. The implicit and incorrect assumption is that a function generated by cultural transformation possesses indubitable advantages over a natural one, and if we are faced with some of its imperfections, then it has been imperfectly acquired.

The advantage of higher functions over natural ones is not so obvious. V.M. Allakhverdov points out that the newborn child possesses such perfect reflex control (for instance, the grasping reflex allows the child to do chin-ups, after grabbing the hand that is lifting him) which he doesn't achieve on the voluntary level anytime soon, maybe never; and capabilities, speed, and volume of information processed on the conscious level never match the capabilities of the human organism (Allakhverdov, 2003). The advantages of higher functions lie elsewhere: in the possibility to go beyond existing stimulation, to act or not to act according to some other, non-natural rules, and sometimes despite them. Here we should especially underscore that *denial, inhibition, and prohibition*, as forms of socialized self-regulation, have no less significance than mastery of something jointly with an adult. Effort and tension are especially important for generating higher forms of the psyche. Further internalization has to involve an obligatory stage of externalization of involuntary natural activity, its objectification, and the subsequent post-voluntariness requires the preceding de-automation. Leontyev's well-known parallelogram of development reflects very important, but not fully intelligible phenomenon, that is, possible deterioration of activity at the initial stage of the acquisition of mediating instruments. The comprehension of “inhibition”, “restriction” as the essence of the interpersonal stage of higher function formation is analyzed in some detail by D.B. Elkonin (1988), and earlier by Ribot (cited in Nicolas, 2008).

As mentioned above, the cultural-historical approach in its classical variant applies to quite a limited number of mental functions, although there have not been and there are not any fundamental limitations in this approach to understanding either mental or non-mental functions. It concerns primarily the cultural transformation of the human body, which is extended not only by the acquisition of instruments, but by the total transformation of the senses, motor capacities, and even formation of virtual mental functions (the Internet, computers, imaging systems) (McLuhan, 2011).

This is a new field for application of the cultural-historical approach to the transformation of culture itself and generation of fundamentally new psychological instruments/tools, which go beyond a simple sign or physical body. However, the foundation for such a transformation is already laid at the formation of the cultural body, the cultural bodily and physiological functions, which do not coincide with the way the natural functions at their foundation are realized and managed. In the most general form, the idea of a cultural body was formulated by K. Marx in his remark, “Hunger is hunger but the hunger gratified with cooked meat eaten by a knife and fork is a different hunger than that which bolts down raw meat with the help of hand, nail, and tooth” (Marx & Engels, 1955, p. 28).

The restrictions imposed on natural functions by society create a fundamentally new “landscape” of the cultural body. Prohibitions and rules that govern eating and excreting create the new reality of an “alimentary” body; rules of hygiene cre-

ate the subjective phenomenon of “cleanness and dirt”; sexual prohibitions cultivate the “erotic body”. The last group of taboos is particularly demonstrative. Sexual impulses, colliding with the regulation of their manifestations, form totally unique ideas about the erotic/non-erotic, which are closely connected with the historical, religious, and ethnic variants of what is banned or allowed. Although sexual attraction is traditionally regarded as among major and most fundamental human needs, control over it can be traced to the dawn of human history, particularly in European culture. European culture is characterized by zones of “acceptable” manifestations of sexuality and the distinct “marking” of those that are forbidden. This requires mastering one’s erotic attractions and turning one’s sexual impulses from natural and involuntary into voluntarily regulated.

Following Vygotsky, if one accepts that the most important “trait of higher mental function is mastering one’s own behavioral process”, then it is perfectly logical that sexuality loses its involuntary character quite early. Moreover, this is the only human function whose canons of realization are even fixed by legislation. As a result, there is a new, socially determined regulatory principle of sexual conduct. It is sexuality that most corresponds to the idea of “cultural development”, that “not nature but society should be regarded as the determining factor of human behavior”.

The hierarchical structure of human sexuality shows itself in that the natural need for procreation is instinctive in nature, with clearly delineated unconditioned stimuli; it is realized as a chain of reflexes, under conditions that correspond to these unconditioned stimuli. It also shows itself in that from a certain point it begins to conform to conventions that are not biological, but social in nature, and it becomes a “genetically more complex and higher form of behavior”. The hierarchical structure of human sexuality reveals itself in its potential for repeated breakdown: for instance, “removing” higher regulatory forms when a person is under alcoholic or drug intoxication, in a pathological state of affect, in frontal lobe syndrome and other lesions of the cerebral cortex. As in some other variants of higher mental functions, in the new structures of human sexuality (unlike lower mental functions) the difference lies in, first of all, that the direct unity of stimuli and reactions in a single complex is broken.

Exactly like other mental functions, human sexuality is characterized by the lifetime social nature of its formation. However, in this case the specific socialization is determined by the combination of the severity of prohibition, its inner contradiction and not always explicit wording, and that the interpersonal stage of its formation is mostly characterized by the sharing not of the *fulfilment* of the function, but its *prohibition*. What is mastered at the start is not only and not so much the model of realization, but also the stereotype of inhibition. M. Foucault demonstrates that the silent management of children’s sexuality by interpersonal activity may be realized not only in words, but also in the very architecture of educational buildings (Foucault, 1996).

Last but not least, let us dwell on one of the most remarkable moments of the socialization and transformation of innate biological functions into higher mental functions, regulated voluntarily and then post-voluntarily and mediated by special tools. Besides the generation of new forms of activity, this process may be attended by a somewhat incidental but still fundamental feature: the generation of the subject itself, consciousness. Having encountered an obstacle on the path of the involuntary, unconscious fulfillment of any natural function, the subject “clarifies” itself for itself,

becoming the object for itself. This is possible only under conditions of “delayed”, “restrained” activity, whereby the subject displays itself in the form of a subject of deficiency, and then also of activity.

The clarification occurs, apparently, according to a universal mechanism of consciousness: one becomes aware of everything that meets with an obstacle on the path of direct and unfettered realization. We confront the substance of thinking when we cannot accomplish a task, and the substance of memory when it fails us. This resembles the probe, which phenomenologically exists in the zone of its “semi-transparency”, partial controllability. As soon as it ceases to obey fully, it turns into an external object; and as soon as it becomes fully subordinate and predictable, it becomes part of the body scheme and is no longer conscious. It can be represented as a metaphor of glass: if we see completely opaque glass, we have no way to determine its thickness, it appears to us only as a surface; if it is utterly transparent, we cannot perceive it at all. The glass appears to us only when we encounter it one way or another, if it is semi-transparent or dusty.

The genesis of “subjectness”, like all the forms of higher activity, takes place in ontogeny, when the child encounters cultural restrictions and requirements and has to accommodate himself to them, turning himself, in a process of “normal alienation” from equivalent physical and physiological “forces”, into the author of his actions. Another precise ontogenetic instance of generating subjective responsibility: making the child sit in the corner. This situation is differentiated from normal action. The child’s actions are not confined with the physical limits of the situation: he can leave the corner but does not do so, transforming the lack of action into his own action, another person’s will or the fear of punishment into his action of “inaction”.

This is the stage of ontogenesis when the child is forming his own consciousness. J. Piaget’s statement about the connection of the advent of egocentric speech with the difficulties of the operational aspect of the child’s activity can be amplified with a hypothesis about the necessity of normal self-alienation, the primary externalization of the ego with a subsequent new internalization and the formation of a mature identity. In other words, an adequate identification is the product of the internalization of what was previously externalized; it develops in a process of step-wise formation of the ability for voluntary regulation. This is the stage of egocentric speech when the child speaks of himself in the third person, which is corroborated by the relatively late formation of the first person pronoun in language and with the absence of phenomena of alienation in younger children and in archaic cultures.

Conclusion

The cultural-historical approach to the problem of socialization may be considered in a much broader way than as merely the development of higher mental functions. It is about the transformation of biological substance into human substance. Through this process a person becomes not only the slave of his environment, perceptive field, or instinctive drives and emotions, but he gains a set of psychological tools to separate himself from these and acquire a certain autonomy.

Some of these technologies are quite obvious. For instance, there are entire technologies to stimulate the appetite or arouse sexuality, such as culinary arts and pornography. But other mediating instruments are less evident and use both chemical and non-chemical mediators: drugs, alcohol, medicines, as well as poetry, music,

and philosophy. But all of these are the tools of human culture, helping people master their own behavior. The socialization of natural properties, psychic, physiological, corporeal functions, drives, and needs is remarkable for all aspects of human existence, from the birth of a child until his death including, a culture's most existential moments: life and death, conception and birth, sickness and health. These are not simple landmarks and properties of biological existence, but to a great extent socially and technologically mediated phenomena.

References

- Allakhverdov, V.M. (2003). *Metodologicheskoe puteshestvie po okeanu bessoznatelnogo k tainstvennomu ostrovu soznaniya* [Methodological travelling in the ocean of unconsciousness to the enigmatic island of consciousness]. St. Petersburg: Rech.
- Bakhtin, M.M. (1928). *Avtor i geroy v esteticheskoy deiatelnosti* [The author and hero in aesthetic activity]. Leningrad.
- Dobrynin N.F. (1938). *O teorii i vospitaniy vnimaniya* [On the theory and training of attention]. *Sovetskaya Pedagogika* [Soviet Pedagogy], 8, 12-32.
- Foucault, M. (1996). *Volya k istine: po tu storonu znaniya, vlasti i seksualnosti* [The will to truth: to the other side of knowledge, power and sexuality]. Moscow: Castal.
- Hegel, G.W.F. (1997). *Nauka logiki* [The science of logic]. St. Petersburg: Nauka.
- Khomskeya, E.D. (2005). *Neyropsikhologiya* [Neuropsychology]. St. Petersburg: Piter.
- Luria, A.R. (1969). *Vysshie korykovye funktsii cheloveka i ikh narusheniya pri lokalnykh porazheniyakh mozga* [Higher cortical functions in man and their disturbances in the presence of local brain lesions]. Moscow: Moscow University Press.
- Luria, A.R. (1982). *Etapy proydennogo puti: Nauchnaya avtobiografiya* [Stages of the path traversed: A scientific autobiography]. Moscow: Moscow University Press.
- Marx, K., and Engels, F. (1955) *Works*. Volume 46, Part I, p. 28. Moscow: Polityzdat.
- McLuhan, M. (2011). *Ponimanie media* [Understanding the media]. Moscow: Kuchkovo Pole.
- Nicolas, S. (2008). "Théodule Ribot (1839-1916). Le philosophe, la mémoire et l'imagination", *Sciences Humaines*, hors-série spécial, 7, September-October.
- Sacks, O. (2006). *Chelovek, kotoryy prinyal zhenu za shlyapu* [The man who mistook his wife for a hat]. St. Petersburg: Science Press.
- Senyushenkov, S.P. (2009). *Problema interiorizatsii v istorii otechestvennoy psikhologii* [The problem of internalization in the history of national psychology]. (PhD thesis). Moscow: Lomonosov Moscow State University.
- Venger, A.L., Slobodchikov, V.I., & Elkonin, B.D. (1988). Problemy detskoy psikhologii i nauchnoe tvorchestvo D.B. Elkonina [problems of child psychology and the scientific creative work of D.B. Elkonin]. *Voprosy Psikhologii* [Issues in Psychology], 3, 20-30.
- Vygotsky, L.S. (1982). Istoriya razvitiya vysshikh psikhicheskikh funktsiy [The history of the development of higher mental functions]. In *Vygotsky L.S. Collected Works in 6 Volumes*. Moscow: Pedagogika.

Original manuscript received December 14, 2015

Revised manuscript accepted June 01, 2016

First published online December 01, 2016