

Situational binding in cross-cultural studies, the works of L.S. Vygotsky and his school

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1. Some empirical findings.

The situational binding is a concept coined by Lev S. Vygotsky in his last works devoted to the development of higher psychological functions (HPF) as a united dynamic sense system of consciousness (Vygotsky, 2001; 1984a). The core methodological reason of W hpu1 t! u fps ! pg dpotdjj tofft! jt! u bl ju! I G ti p rncf! tu ejfe! copu! jo! pou- and sociogenesis (Ponomariov, 2012). Due to his early death Vygotsky did not implement the concept of situational binding to the sociogenesis of HPF. In this article such an attempt is made in pursuit of finding some connections of this concept with a broader range of scientific explorations.

Vi fl i jtupsjdbnef fmpn fou pg I G bt! tu ejfe! jo! tf fsbmW hpu1 t! ps!t! u fl n ptucspn jofoucf joh!)² Tu ejt! po! u fl i jtups ! pg cfi b jps! bqf! qsjn juj f! boe! di jn! co-authored with Alexander R. Luria (Vygotsky, Luria, 1993a) and a closely related logojri fe! cpl ! Vppitbo! t jho! jo! u fl ef fmpn fou pg u fl di jra!)W hpu1 ! 2: 95c ! boe!³ u fl gp su! di bqfs! jo! Vi jol joh! boe! tqffdi !; Hfoftjt! pg u jol joh! boe! tqffdi !)W hpu1 ! 1934)² Ju bt! brnp! up di fe! qpo! jo! u fl di bqfst! F qfsjn foubn uey of concepts ef fmpn fou! boe! Vi p ni u boe! pse! pg u jt! cpl / F qfsjn foubn jo ftujhbijpot pg tpd/phfoftjt! pg I G! jo! M sjb t! op d rbttd dsptt-cultural research, were designed by both Luria and Vygotsky (Luria, 1974; 1976). Let us start from the latter to find some intimate connections with the former works in the next sections.

M sjb t! sftfbsdi! bt! eftjhofe! bt! bl gstu tufq! jo! ti fl bn cjuj! t! fu pg d m sbrn sociogenetic studies planned by Vygotsky (see for details: Cole et al., 2011). As a part of this larger project, Vygotsky and Luria managed to organize only two scientific expeditions to Central Asia (mostly to Uzbekistan) in the years 1931 and 1932. For many reasons, this research was not accomplished as designed and its results were only published in detail by M sjb t! 2: 85 < 2: 87 ! mpon! bafs! W hpu1 t! ef bu! jo! 2: 45/

Vi fl n fu pepm jdonjef bl cfi joe! W hpu1 boe! M sjb t! sftfbsdi! bt! up! tu e ! u pl hsp qt! pg bel nt! ju joi u fl tbn fl qpq! rhujo! b g f duf e! boe! opub g f duf e! c ! d m sbrndi boh f ! jo! the period of a rapid economical and educational transition. Such a period was the beginning of 1930s in some of economically retarded soviet republics suffering from massive dprfduj j bujo! boe! gpdfe! joe! tsujbrj bujo! F fou bm! jo! M sjb t! tbn qrfi! u fl hsp qt! ju! diffesfou efhsfft! pg d m sbrndi boh f ! fsf! n psf! u bo! u pl bt! d bo! cf! tffo! gpn ! qspudprtl

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² For the critique of the quality of English translations pg Vi jol joh! boe! tqffdi , see: (van der Veer & Yasnitsky, 2011).

(Luria, 1976) basic school education by an adult (however brief), a study of literacy, visiting a town and its museums, change of household (from independent/communal to collective), participating in member-meetings on collective farms (which included discussions of agricultural work plans, reading decrees, etc), and other types of decontextualized activity.

The experimental tasks of the studies were adapted to the local traditional culture of rural peasants who constituted the main subjects. After the first empathetic contact had been established, all the tasks were presented to participants in a colloquial informal conversation, in the relaxed atmosphere of a tea-house or some other similar place. Because verbal riddles and puzzles were the hallmark of traditional peasant culture, they were expected to accept this quite naturally. Let us focus here on syllogistic reasoning results later replicated and confirmed from different methodological perspectives.

Peasants were introduced to two types of syllogisms. The first presented content partially familiar to them, e.g.: *Cotton grows where it is hot and dry./ England is cold and damp./ Can cotton grow there or not?* And the second presented totally unfamiliar content, e.g.: *In the Far North, where there is snow, all bears are white./ Novaya Zemlya is in the Far North./ What colour are the bears there?* What stood out was the fact that, in their answers, most non-literate or un-schooled peasants bluntly refused to go beyond personal experience, e.g.:

The white-bears syllogism is presented.

What kind of bears are there in the North?

I p !dp r! !tb ! !i b fo utffo ! Jg !i bel tffo ! ! p r! !op /

But what can be concluded from my words?

I p !dp r! !op ! jg u f ! bsf ! i jf ! psl' rhd ! "

The syllogism is repeated.

!epo ulop ! i p !dp r! ! qptt jcm ! op ! Jg u f ! n p uher and the father are i jf ! u fo ! u f ! bsf ! i jf /

Why have you thought that they are white?

fsi bqt ! u f ! bsf ! i jf ! c f d b t f ! u f ! q r h d ! j t ! i jf !

(Luria, 1974, p. 115).³

ft b o u t ! f q r h o b u j p o t ! g p s ! u f j s ! s f g t b h p ! t p m f ! b q s f t f o u e ! t m p h j t n ! r f i b f ! o p l e o u b t s u b u q f s t p o b i f q f s j f o d f ! n b u f s t ! i j h i m ! X f ! b m b t ! t q f b l ! p o m ! p g i b l f ! t f f ! f ! e p o (u b r h ! b c p u i b l f ! i b f o (u t f f o / ! If there was someone who had a great deal of experience and had been everywhere, he would do well to answer the question. / Moreover, it is a visual aspect of personal experience that is appealed to strongly by different participants: You've t f f o ! u f n ! p ! ! o p ! ! i b f o (u t f f o ! u f n ! t p ! i p ! d p r ! ! t b " ! ! e p o (u l o p ; ! J (f l o f f s !

³ Vi jt!qjfd!pgM'sjb t!c ppl !as well as some other pieces, is missing in the English edition of 1976.

... only by someone who [has seen]⁴, and ... , etc (Luria, 1976, pp. 108-114).

... information is ... or eighty and had seen a white bear and had told about it, he could be believed, but I've never seen one and hence I can't say. That's my last word. Those who saw can tell, and those who ... I never traveled through Siberia. Tadzhibai-aka who died last year [saw Siberia]. He told [me] that there were white bears there, but he didn't say what ... (Luria, 1976, pp. 108-114).

The refusal to go beyond personal experience does not mean that peasants could not think logically. On the contrary, they solve syllogisms with familiar content and sometimes can solve those with unfamiliar content, especially under the pressure of an investigator. The depth and logic of their thought can be seen in many examples:

... If it's like [our] Kashgar country, it will grow there too. If the soil is loose, it can grow there too, of course!

... From your words, I would have to say that cotton shouldn't grow there. But I would have to know what ... (Luria, 1976, pp. 108-111).

(Luria, 1976, pp. 108-111).

The last example is especially interesting. It shows that the participant understands the task and can solve it, but refuses to do so because it goes beyond personal experience. In that respect, the latest experimental investigation, confirming that unschooled people can ... (Dias et al., 2005).

... refusal to solve syllogisms that go beyond personal experience were obtained from unschooled subjects in completely different cultures (e.g., Scribner, 1975; Scribner, Cole, 1981, pp. 126-128; Tulviste, 1988, pp. 232-241). Moreover, unschooled participants were able to solve these syllogistic tasks much more successfully if they were constructed to minimize the influence of personal experience (e.g., the premises referred to a situation on another planet) and what was expected was explained before the presentation of syllogisms (Scribner, Cole, 1981, pp. 154-156; Dias et al., 2005). On the other hand, schooled participants from the same localities as main subjects always performed more accurately and

⁴ Here and further in the text in square brackets will be given the most variant of translation checked with the Russian originals.

successfully than unschooled ones. The need for especially favorable conditions for unschooled participants to solve syllogisms more successfully shows that something stops them from doing so otherwise. All facts seen so far lead us to conclude that this something is a deep reliance on the personal experience, especially visual experience.

The reliance on visual personal experience can be traced in five different series of mathematical problems, imagination, and self-consciousness (Luria, 1976). Only one additional example involving mathematical problems is presented here:

Given whose conditions conform to reality:

It is four hours on foot to Vuadil, and one hour to Mazar. How much sooner would you arrive in Mazar?

Replies at once:

4!i p st! tppofs/

A problem opposite to reality is given:

Suppose it were to take one hour to get to Vuadil on foot, and six hours to Mazar, how many hours sooner would it take a man to get to Vuadil?

one hour to Mazar, and if one man stays in Mazar, then the second one will yet go on a

Ok, and the teacher has given another problem. The conditions of the problem are repeated.

p!u f! jntbssj fljo!N b bs! tppofs/

And suppose it were to take six hours to get to Mazar, and one hour to Vuadil, then who will arrive sooner?

B!n bo! dboopubssj fl tppofs! jo! W be jrl! W be jrt! gsu fs"//

We know that is wrong! The teacher has simply given such a problem to check how pupils calculate. How could you calculate an answer to it?

I p !dp! ra! Jqpttjcm! hj fl p! bo! bot fs "Jldbo uc! tp! gbs" J! ep! l op !u b! gbs! j! gbs! boel drptf! jt! drptf/

(Luria, 1974, pp. 134-135).⁵

Thus the main conclusion that can be drawn from the experiments is that, for unschooled people, reliance on the personal experience is crucial. The visual aspect of the personal experience is referred most often and most insistently. When relying on the non-personal experience, the authoritativeness of a source is very important.

But as the later experiments confirm (e.g., Cole et al., 1971; Sharp et al., 1979), completely vanish or are weakened with individuals who have obtained at least 1-2 years of schooling. This is especially true for unschooled

⁵ Vi j! q! j! f! d! p! g! M! s! j! b! t! c! p! p! l! j! t! n! j! t! j! o! h! j! o! u! f! F! o! h! n! j! i! f! e! j! u! p! o! p! g! 2: 87/

qbsuidjbout !qspdf tft! pg jogsfodf! qfsdfquipo !jn bhjobujpo !fud !Vs joh! up! gje! u fl! bot fs!
up! u jt! r! ftujpo ! u fl! qbqfs! u sot! p! b! tu e ! u bl gomp fe! cpu! jo! W hputl ! boe! M sjb !
footsteps.

2. Later investigations.

In the late 1970s Peeter Tulviste, a student of Luria, decided to construct his experimental cross-cultural research so as to investigate both syllogistic reasoning and the effect of the transfer of operations from one domain to another. Vygotsky, the psychological operations in some word-meaning systems, which he called *psychological operations* specific to school-type activities. First developed in the scientific domain of cognitive activity, these psychological operations are then transferred as a structural principle to other spheres of consciousness fundamentally reorganizing its higher psychological functions (Vygotsky, 1934; 2001, pp. 285-302).

In composing the hypothesis of his research, Tulviste refers to the activity approach to the problems of historical development of thinking makes us consider the differences between different cultures as the reason both for historical changes and for cross-cultural differences. Vygotsky (1934; 2001, pp. 285-302) thinking, Vygotsky called thinking in scientific concepts, should appear in connection with the development of scientific concepts. Vygotsky (1934; 2001, pp. 285-302) cultural expeditions were organized by Tulviste to Western Siberia and Kyrgyzstan.

The first series of trials were made with schoolchildren⁶ from 2 to 6 grades in the remote regions of Western Siberia (Tulviste, 1988, pp. 218-220). The syllogisms were of two types: theoretical and empirical. Theoretical syllogisms were based on knowledge of an individual (e.g., *All precious metals do not rust. / Molybdenum is a precious metal. / Does molybdenum rust or not?*). Empirical syllogisms were based on the individual's personal experience (e.g., *All metals rust. / Iron rusts. / Does iron rust?*).

Whenever a participant gave a theoretical solution, it was regarded as a theoretical solution. Whenever a participant gave an empirical solution, it was regarded as an empirical solution. A framework developed in earlier cross-cultural studies (e.g., Scribner, 1975). Justifications were regarded as theoretical if they referred to information presented only in the premises, and empirical if they referred to personal practical experience.

The working hypothesis of the first series was that, if the content of a syllogism has a theoretical character, then a theoretical solution will prevail over an empirical one; by contrast, if the content of a syllogism directly refers to everyday experience, then an empirical solution will prevail over a theoretic one. The

⁶ Predominantly they were of the Nganasan whose language is close to the Finno-Ugrian ones.

experimental evidence found that schooled children prefer theoretical solutions, when they could not appeal to their everyday experience. The theoretical solution and, moreover, the empirical solution and justifications were obtained in the theoretical school context. The empirical solution and justifications were obtained in the everyday context.

Summarizing these results, Tulviste argues that the certain operations with words and sentences that are specific to this type of activity (Tulviste, 1988, pp. 221-339). Verbal thinking acquired at school is a unique *neofunction*, not the transferring of universal human mental abilities into a new sphere of knowledge.

A second expedition was organized to the mountain plateaus of Kyrgyzstan, where some people had achieved a grade 10 school education, but then returned to the traditional types of economic and cultural activity involving little or no theoretical activity. Besides, among the 70 participants aged 25 to 87 (average 52.7) 18 were completely illiterate. The empirical solution and justifications were obtained in the everyday context.

Participants' solutions and justifications of their solutions showed that personal experience plays a central role in their judgments of syllogisms. Some of participants were able to solve the syllogism using both theoretical and empirical methods, but in a confused way. Surveying a large corpus of scientific data, Tulviste comes to the conclusion that the participants of his study lost some of their skills of theoretical verbal thinking obtained at school (Tulviste, 1988, pp. 237-238). Similar data confirmed the deterioration of theoretical skills learned at school if they are not used in everyday practice (Scribner, Cole, 1981, p. 131).

These findings implicitly confirm that concrete activity determines ways of thinking, but verbal thinking is used more or less regularly in the everyday practice. For example, we can develop rather good skills in some foreign language, but if we do not use it, we will lose these skills rapidly. Thus, verbal thinking is used more or less regularly in the everyday practice. For example, we can develop rather good skills in some foreign language, but if we do not use it, we will lose these skills rapidly. Thus, verbal thinking is used more or less regularly in the everyday practice.

3. Discussion of empirical findings.

The psychometric techniques, applied in cross-cultural researches, raise doubts even among scientists who use them. The cross-cultural psychologists Michael Cole and Sylvia Scribner, who made many researches, found that the influence of school education on cognitive development not about general influence

(Scribner, Cole, 1981, p. 234). Tulviste sticks to the close position in his later article, written in collaboration with one of well known western vygotskians (Wertsch, Tulviste, 1992). Therefore, it is impossible to draw any conclusions about both the general and the specific influences of school education on the cognitive development based on the data from these syllogistic tests. As Vygotsky said in his analysis of first cross-cultural researches, we do not know precisely what we investigate. We do not know even what the units of our analyses are (Wertsch, Tulviste, 1992, p. 374). The problem of cross-cultural psychometric techniques has been discussed by the author and his colleagues earlier (Cole et al., 2011; Ponomarev, 2007b) and here the focus will be on a different subject.

Understanding the biases of the psychometric approach, Vygotsky and Luria chose a different paradigm, in which such tests are only a part of a bigger experimental background with specially developed tests that the subjects found meaningful and open to several learning tasks in the experiment. By offering to help subjects in certain ways, we tried to show them how, and how much, they could use this assistance in solving a given problem and in proceeding to solve others. By⁷ uniting direct and learning tests, an element of experimental-genetic analysis was added to the study that became a combination of experimental and clinical procedures, which allowed for the desired completeness of

In the western scientific tradition the tests from their cross-cultural study were experiments, on which this methodology was constructed. One of the reasons for misunderstanding is that some important works of Vygotsky only became available to scientific community in the mid 1980s and later (Vygotsky, 1984a; 2001). Another reason for cultural context (see for some useful comments on this: Ageyev, 2003). One of the purposes of this paper is to place Vygotsky-Msjb's cross-cultural study in its proper scientific and historical context.

As it was mentioned earlier, Msjb's study was only published in full over 40 years after its completion (see for details: Cole et al., 2006). Hence, we find only scattered appraisals of it by Vygotsky (see the section 5 of this paper). But such a delay before publication gave Luria an opportunity to compare his results with many data obtained to that date by western cross-cultural researchers (Luria, 1974, pp. 11-19). These comparative data are absent in the English edition of the book (Luria, 1976). Constantly rethinking the results in light of these comparisons and his own later data, Luria used two diagnostic criteria to

⁷ This last sentence is missing in the English edition.

describe psychological processes: theoretical (verbal-logical) and visuo-practical⁸. The reliance on the visual personal experience is found when the visuo-practical processes predominate over the theoretical ones (Luria 1974, pp. 163-166). What is the origin of these theses in the Vygotskian heritage?

Luria refers to Vygotsky's theory of consciousness several times, throughout the first chapters of the book (Luria 1974, p. 23, p. 30, p. 35, p. 45, p. 53, p. 63), highlighting that the whole study was constructed based on this conception. Luria admits that his experimental techniques afforded to explore only the sense processes of consciousness (Luria, 1974, pp. 30-31). But, as Vygotsky proposed, the sense and system organization of consciousness forms a unity (Vygotsky, 1984a). Relying on this, Luria suggested that fundamental changes of both the sense and the system organization of consciousness were partially revealed in his experiments and the mutual historical development of culture and cognition to some extent experimentally disclosed (Luria, 1974, pp. 161-166). To explain what the sense and system organization of consciousness is, a deep analysis of recently published works of Luria (Luria, 1974, pp. 161-166) and his understanding of his theory of consciousness (Ponomariov, 2012). In the next sections an attempt will be made to show how this concept deepens scientific understanding for the phenomenon of reliance on personal experience, found in cross-cultural studies, placing it in the wider context of studies devoted to the development of speech and word-meaning systems.

4. The role of speech for psychological development

Luria's theory of consciousness is based on the concept of 'visuo-practical' development (paedology) this concept refers to the process, observed on the first stages of ontogenetic development, when the actual impelling environment binds our perception, thinking, etc into a coherent experience of consciousness (Vygotsky, 1984; 1966; 2001). The surrounding milieu guides behaviour with affective vectors initiated constantly through

⁸ The term 'visuo-practical' (visuo-prakticheskii) is used by Luria (1974, p. 163) and is close to the term 'sensori-moteur' of J. Piaget (see: Zaporozhets, 2000, p. 39).

⁹ Indeed, these two words are rendered here verbatim, in full agreement with the published Russian text of the book (Luria, 1974, p. 163) that came out under the editorship of M. Yaroshevskii and others. The first one, although rendered with a mistake, can be easily identified as *Situationsgebundenheit*, which seems to be fairly legitimate word from standpoint of Lewinian topological psychology. However, the other word is neither a legitimate word in the German language nor a Lewinian coinage, but a mistake. Our gratitude to Alexandre Metraux, an editor of several volumes within a multi-volume series of collected works of Kurt Lewin (*Kurt Lewin Werkausgabe*, in German). A. Yasnitsky.

environments helps to create the higher psychological functions of consciousness in the process of interaction with adults, because cultural practices and possible types of activity are inherited with the human tools that play a role in the process. Systematic using of such simple (at first sight) tools as a spoon and a stool in the situation of food-consumption mediates a breakthrough in the complete isolation of deafblind children. Gradually, minute by minute helps to humanize gradually their psyche; otherwise, these children remain in a state of complete isolation. This research allowed Vygotsky to find a unit of analysis for studying relations and connections between affect and intellect – dynamic sense systems – a cornerstone of his conception of the sense and system organization of consciousness because he managed to show in his experimental researches that the simplest systems, uniting affective and intellectual psychological functions, could be formed only on the basis of word elasticity, that find support in the latest data from the neurobiology of consciousness (Tononi, Edelman, 1998; see for details: Ponomariov, 2012). The concept of situational binding is more specifically, the problem of explaining what binds diverse neural activity into a coherent conscious experience.

In clinical and experimental research of dementia, conducted under the supervision of Vygotsky, a detailed description of intellectual, affective, verbal and other characteristics of situational binding, coming as a result of massive damage to the frontal cortex, were elaborated (Samukhin et al., 1934). This research allowed Vygotsky to find a unit of analysis for studying relations and connections between affect and intellect – dynamic sense systems – a cornerstone of his conception of the sense and system organization of consciousness because he managed to show in his experimental researches that the simplest systems, uniting affective and intellectual psychological functions, could be formed only on the basis of word elasticity, that find support in the latest data from the neurobiology of consciousness (Tononi, Edelman, 1998; see for details: Ponomariov, 2012). The concept of situational binding is more specifically, the problem of explaining what binds diverse neural activity into a coherent conscious experience.

Lidia I. Bozhovich, one of Vygotsky students, conducted in the late 1920s and early 1930s three series of experiments to find how speech is related to thinking. These experiments were published only in the year 2006 (Bozhovich, 2006). The first series of her experiments relied on the theoretical schema of a creative act of thinking developed by Vygotsky. The hypothesis was that, if the effective stopping of speech movements, leading them by the way described to the creative act of thinking, happens occasionally (e.g., because of physical exhaustion), the disruption of sensorimotor unity in human beings would occur due to speech. Using almost the same terms though in a much broader context, Vygotsky described, based on his experiments, the gradual formation of a dynamic sense system. The hypothesis was that, if the effective stopping of speech movements, leading them by the way described to the creative act of thinking, happens occasionally (e.g., because of physical exhaustion), the disruption of sensorimotor unity in human beings would occur due to speech. Using almost the same terms though in a much broader context, Vygotsky described, based on his experiments, the gradual formation of a dynamic sense system.

development (Vygotsky, 1984a; 1966; 2001). It seems reasonable further to speak of a semantic field of speech.

Visual and accompanied by tests with typically developing children. It proved the hypothesis. Rosa U. Levina, another Vygotsky study, with the results confirming that of the latter in relation to the role of speech for overcoming of the binding with a visual field (Levina, 2005). The second series showed that relations and connections between speech and intellect cannot be found with those experimental methods that explore only outer features of speech process and ignore the development of word meanings. The current studies of private speech, methodological path when they do not take account of the functions and structures of word meanings in the investigation of relations between speech and other psychological processes: voluntary control, social competence, cognitive skills, etc (Lidstone et al., 2011; Martinez et al., 2011; etc). Trying to find new methods and rethinking the problem, Bozhovich began the political repressions of the mid 1930s against paedologists, though its first results were very promising and used later by Alexander V. Zaporozhets (2000).

It has still remained a task for future to create classification of relationships and connections between speech and other psychological processes on the basis of experiments. Even though some studies show that there is a clear relationship (e.g., Winsler et al., 2003; 2007), the main word structures and functions that allow speech to change fundamentally behaviour has not been described. Vygotsky and Luria understood the complexity of this problem (Luria especially underlie) and tried to find as many as possible ways to investigate it. In the next section some of their works concerned with this problem will be regarded.

5. The development of word meanings

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He also studied experimentally and collaborated with L.S. Sakharov (Vygotsky, 1934). The research showed that the different

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(Vygotksy, 2: 45) M s j b t! q s p c f t! p o! t f n b o u j d! o b t t j j d b u j p o! f s f! b l g s t u b u f n q u u p f q f s j n f o u b r m! q s p f! W h p u t l t! u f t j t! b e p u u f! e f f r p q n f o u p g word meanings *in sociogenesis*, as Luria points out at the beginning of the chapter in which this is discussed (Luria, 1974, p. 63, p. 66), and when he draws conclusions (Luria, 1974, pp. 99-104). In this chapter Luria (1974, p. 66, pp. 93-94, pp. 97-98) also refers to the study conducted by W h p u t l ! b o e! k o t f g o b T i f f g p o! u f! e f f r p q n f o u p g t d j f b u j g i d! b o e! f f s e b! d p o d f q u!) p s! p s e! n f b o j o h t! c f d b t f! W h p u t l ! t f e! t o p o n p t m! i f t f! u f s n t! b n p o h! t d i p p r d i j r a s f o! (Vygotksy, 1934; Sheef, 1935), stressing its importance for his probes. These intrinsic d p o o f d u j p o t! c f u f f o! W h p u t l t! j o f t u j h b u j p o t! b o e! M s j b t! d s p t t - c u l t u r a l r e s e a r c h a r e usually not taken into account by critics.

G r m p j o h! M s j b t f q f e j u p o! u p! f o u s b t t j b! W h p u t l ! b t! d p o j o d f e! f o p h i c l i j s f q f s j n f o u b r m g i o e j o h t! p s j u! j o b q s j b u! r i u s! u p! i j n! B t! g s! n! j o b s e! b t t f t n f o u! J I have shared it with you many times: I continue to think and will continue to think, until I am persuaded otherwise, that there is now *experimental proof* (proof based on factual material, material *richer* than in *any* ethnopsychological study, and *purier* b o e! n p s f! d p s s f d u u b o! M - Bruhl [])¹² for the phylogenetic¹³ existence of a level of [complex] thinking [and] of a *different* structure [that depends on it]¹⁴ of all the principal systems of the psyche, of all the major types of activity, and eventually of consciousness itself. Surely that is not so little as to c f! e j t t b u j t g i f e! j u! u f i p u d p n f! p g u f! u p! s j t!) W h p u t l ! 2007, p. 45).

Many years after these words had been written, Luria concluded on the basis of his b o e! p u f s! t d j f o u j t u! t u e j f t! j o! o f s p t d j f o d f! o f! s p r i j o h! j t u j d t! b o e! b o u s p q p r h! ; V i f s f g s f! the whole evolution of language can with full justification be represented as the path of liberation from dependence on the synpractic context, as the path of gradual formation of n f b o t! j o d s f b t j o h! u f! s p r i p g n o h! j t u j d t!) d p o u s d u f e! j i! p s e t! t o t f n b o u j d! d p o u f u!) M s j b! 2002, pp. 245-246; see also: Luria, 1979, pp. 32-36). Splitting the sympractic (a more correct Latin form) and the synsemantic context has a direct link to the visuo-practical and the theoretical character of a psychological activity (see the section 3 of this paper). The n i e f s b u j p o! g s p n! e f q f o e f o d f! p o! u f! t o q s b l u j d! d p o u f u! n f b o t! u f! p f s d p n j o h! p g t j u a t i o n a l binding with personal experience. It is accomplished with the help of mutual development of speech, literacy and writing (Luria, 1979; Vygotksy, Luria, 1993a).

B t! W h p u t l t! f q f s j n f o u! t i p f e! d i j r a s f o! t f! u f! t b n f! p s e t! b e p! b e n t! c l u the m f l o j o h t! p g d i j r a s f o t! p s e t! d b o! c f! r j f! e j g g s f o u b o e! u p! g i o e! u j t! e j g g s f o d f! f! o f f e! to trace how words are formed, i.e. to trace every verbal operation in the process of word formation (Vygotksy, 1934, pp. 158-159; cf., Tulviste, 1988, pp. 260-261). Similarly, a word from archaic and sympractical languages can coincide with our word in its reference

¹² A round bracket here is missing; the translation is checked with the Russian original (Vygotksy, 2004, p. 36).

¹³ Vygotksy t f e! u f s n! p h y l o g e n e s i s! b t! b l d b u f h p s! j o d i n e j o h! u f! i j t p s j d b t e f f r p q n f o u p g i n b o! t p d j u!) d g! Vygotksy, 1984b; 1934).

¹⁴ In the English edition of 3118 j u j t! u s b o t i t u f e! b t! j o e f q f o e f o u p g j u!) W h p u t l ! 2007, p. 45) which turns the meaning of the phrase into the opposite. Most explicitly this part of W h p u t l t! q i s b t f! d b o! c f! u s b o t i t u f e! u! t! u f! p h y l o g e n e t i c e x i s t e n c e o f a l e v e l o f c o m p l e x t h i n k i n g a n d t h e p h y l o g e n e t i c e x i s t e n c e o f a d i f f e r e n t s t r u c t u r e (t h a t d e p e n d s o n t h i s l e v e l o f c o m p l e x t h i n k i n g) o f a l l t h e p r i n c i p a l s y s t e m s o f t h e p s y c h e, o f a l l t h e m a j o r t y p e s o f b d u j j u! b o e! f f o u b m! p g d p o t d j o t o f t t! j u f r g /

but it does not mean that those people, who used it, made the same operations in a semantic field of speech, as we do. The concept of a semantic field expresses the idea that a word does not exist separately, that its meanings emerge in connection and against a background of other words, i.e. in some semantic system (cf., Luria, Vinogradova, 1959; Luria, 1979). Behind each word, there is a system of psychological operations, which form mutually connected meanings of this word in a semantic field of speech and consciousness (Vygotsky, 1934; 2001). These systems can be almost incompatible with each other, because the different operations are executed on the different stages of word development: proper names, complexes, concepts (see for comments: Ponomarev, 2013). The historical development of psychological operations with word-meaning systems, being the process of formation of different psychological systems of analysis and synthesis, is not reflected in the *lineal* changes in lexis and grammar: archaic and sympractical languages often differ from modern ones (Vygotsky, Luria, 1993a). Verbal thinking and linguogenesis cannot be explored without knowing the nomenclature of psychological operations with word-meaning systems, discovered first in ontogenetic studies (Tulviste, 1977; 1981).

7. Conclusions.

2/ Multicultural research suggests that there are two types of the psychological activity: visuo-practical (sympractic) and theoretical (synsemantic). Neither his own neuroscientific and neurolinguistic experimental data, nor the results of later cross-cultural researchers and other scientists, convinced him to change this position 40 years after the processes, coming as a result of schooling and word-meaning development, can be understood as a gradual weakening of the situational binding with personal experience. The systems of operations with word meanings, having a cardinal impact on all major psychological processes via the semantic field of speech, can be incompatible on the different stages of linguogenesis.

3/ The conclusions, derived from the findings about syllogistic reasoning, and productively formulated by Ponomarev, are in agreement with the latest western cross-cultural studies. By means of these structures and operations, the different systems of word meanings are formed in school or everyday contexts. In the first approximation, the theory of consciousness and should not be analyzed separately from this theory. In turn, psychology relies on experimentation with a concrete phenomenon in a wide

4/ The theory of consciousness and should not be analyzed separately from this theory. In turn, psychology relies on experimentation with a concrete phenomenon in a wide

range of psychological and medical knowledge. Highly relevant to the positive understanding of operations with word meanings, and the concept of situational binding with a visual field.

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