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Editorial

The papers in this number of *Psychology in Russia: State of Art* have been selected from presentations given at the Fifth International Luria Memorial Conference held in Yekaterinburg, Russia in October 2017. They attest to the continuing influence of Alexander Luria on the elaboration of a cultural-historical approach to the development of higher psychological functions across a wide variety of populations and forms of activity. Central to Luria's approach was the extraordinarily broad reach and depth of his scholarship, ranging from the study of sociocultural influences on development, to the diagnosis and rehabilitation of children and adults suffering a broad spectrum of insults occurring in the central nervous systems in subjects ranging from young children to adults. The papers in this volume:

S.V. Propopenko and his colleague investigated the potential of modern, interactive computer programs based on Luria's neuropsychologial theories. The patients had all suffered vascular cognitive impairments. The training materials focused on computer-based tasks involving visual and spatial perception and memory, attention and impulse control. The training proved effective, as did a comparison group that played a variety of commerically available computer games.

J.M. Glozman replicated and extended Luria's study of the influence of cultural change on psychological processes of two groups of adults from a remote area of northern Kamchatka. All of the subjects had completed elementary school, but some worked as nomadic herdsmen, while some lived and worked in a village. The results revealed that despite the fact they all had a modest level of education, the villagers performed better on a variety of tasks, indicating the kind of influence of social experience on cognitive functioning that Luria had reported more than 8 decades earlier.

The paper by O.Yu. Zotova, L.V. Karapetyan & I.V. Gaidamashko study also the influence of cultural change on mental functioning, namely that of globalized challenges on personal psychological security.

O.V. Maslova and her colleagues report significant changes in the social values and acculturation strategies of Vietnamese students attending Russian Universi-

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ties. Her results demonstrate a significant shift in values toward a more materially prosperous life, depending upon gender, the type of environment (rural/urban) the individual comes from, and the strategy of acculturation they adopt.

P.V. Moskaleva and her colleagues studied cognitive and personality changes associated with juvenile myoclonic epilepsy (brief shock-like jerks of a muscle or group of muscles). A major find of the study was that young adults suffering from juvenile myoclonic epilepsy suffered from a number of co-morbid personality and non-psychotic psychiatric disorders, pointing to the need for psychiatric help in addition to currently employed forms of therapy

Y. Solovieva, based on Luria's approach to syndrome analysis, presents a case study of a 12 year old boy who suffered severe brain trauma when hit by a bus. The author combined Luria's qualitative syndrome analysis based on the ideas of complex functional systems with P.Y. Galperin's approach to the step-by-step formation of intellectual actions. This combined method of diagnosis and rehabilitation allowed the patient to reintegrate himself into his family, participate in school and to enjoy the companionship friends. He became more responsible and motivated to participate in all kinds of practical and intellectual activities. Negative emotions disappeared. The patient became reflexive, critical and involved in his own achievements and difficulties. Impulsive behavior disappeared. The parents have expressed positive changes in day-to-day communication.

A.S. Sultanova's research focused on the neuropsychological analysis of mental development among school-age children who had suffered neonatal hypoxia. The author reports that all of the affected children exhibited a "subcortical-frontal" neuropsychological syndrome that negatively affected a broad range of psychological functions.

E.S. Oshchepkova and E.A. Zubova, building on the work of T.A. Akhutina and N.M. Pylaeva, report on a study confirming a significant relationship between a variety of neurolinguistic measures and the ability of 1st and 2nd graders to create a story out of a sequence of pictures. The author confirms a significant relationship between indicators of neuropsychological and neurolinguistic deficiencies and difficulties in story creation.

E. Nikolaeva and A. Novikova report age differences in interactions between creativity and intelligence levels.

Taken as a whole, this set of essays both confirms the effectiveness of A.R. Luria's cultural-historical approach in advancing both theoretical and practical understanding of the development of higher psychological functions.

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LURIA'S LEGACY
IN CULTURAL-HISTORICAL PSYCHOLOGY

A reproduction of Luria' s expedition to Central Asia

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Background. About 40 years ago, Alexander Luria published in 1974 his world known book "On the historical development of cognitive processes". It describes the data of an experimental study of mental functions in illiterate people living in the peripheral parts of Uzbekistan (Central Asia). A.R. Luria together with L.S. Vygotsky worked out the design of this study, performed in 1931-1933. The study proved a significant influence of social life and literacy on the structure of logical reasoning. In the conclusion to this book Luria indicates, that his colleagues often advised him to repeat this study in 40 years, but the author did not considered it reasonable, as radical changes in cultural and educational level of Asia population must equalize the differences in cognitive processes with people from central regions. Is it so?

Study design. A group of psychologists from Moscow, Belgorod and Petropavlovsk Kamchatsky performed an integrated study of endogenous populations of the north of Kamchatka peninsula living in regional centers or nomadic herdsmen in tundra. Thirty subjects (17 men and 13 females) all with primary education in Russian schools were assessed using the same tests on classification and generalization, as Luria did, together with Luria neuropsychological battery, and projective drawing on life attitudes.

Conclusion. Life values of endogenous peoples are more nature centered than in Russians from central regions. Nomadic and settled subgroups with the same level of education differed in some neuropsychological tests, revealing the influence of social life conditions. It confirms Luria's idea about cultural determination of cognitive processes but also shows that life conditions are as important cultural factors as literacy.

Keywords: cultural-historical psychology; social life; cognitive processes; life values.

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Introduction

Let us remind first the question by J. Bruner (2015): how psychology turned toward cultural explication? Upon the author, it was not migration into radically different cultures by refugees from Europe, nor the rise of more subjective anthropology in America, but "a worldwide movement in psychology against mindless, mechanistic theory" (p. 8). The role of Vygotsky in this movement was primordial because he was very sensitive to worldwide cultural change that was taking place during his life.

During the late 1920s and early 1930s, L.S. Vygotsky and A.R. Luria put the task to prove experimentally the impact of cultural factors on human cognition, theoretically exposed already in their "Studies on the history of behavior" (Vygotsky, Luria, 1930) and confirmed in developmental researches (Luria, 1929, Vygotsky, 1930/1982). Both scholars planned two expeditions to the peripheral parts of Uzbekistan (Central Asia) in 1931 and 1933 to investigate the influence of culture, and in particular, of education, on the development of higher cognitive functions (Luria, 1931, 1933, 1971, 1974, 1976). The illness did not permitted Vygotsky to go with Luria but they were in permanent correspondence, discussing all the results as well as the report of Luria in the second Moscow medical institute in June 1931. One of the major results was that illiterate people are bound in their reasoning to the concrete situations of real life. Consequently, they have difficulties in abstract reasoning, in solving problems that are beyond their personal experience. The effect of culture on cognition was not limited to verbal abilities: perceptual and spatial abilities in illiterate people were quite different than in Western people (Luria, 1971). For instance, Uzbek herdsmen living in non-urban environments were much less prone to visual illusions (remember the famous telegram sent to Vygotsky by Luria from his expedition to central Asia: "Uzbeks do not have illusions!").

It proved a significant influence of social life and literacy on the main components of human conscience.

L.S. Vygotsky highly appreciated these results, "leading our common work further and rising our previous studies (such as types of relations in the mediated memorizing and reasoning) to a higher level… This is a golden fund of our experiences that can be easily open by the theoretical key" (from the letter of Vygotsky to Luria on 20.06.1931). "I have received the Report #3 and the protocols of experiences. It was my happiest day in the last time. It is really a key to open locks of many psychological problems. This is my impression. The crucial significance of these experiences is without doubts for me. Our new approach is now achieved (by you) not only in idea, but in practice, in experience" (from the letter of Vygotsky to Luria on 11.07.1931). "In our studies it is an enormous, decisive step, turning to a new point of view. In any European study such an expedition would be an event… Nobody never did a systematic study of system relations in historical psychology, in the life phylogenies from any point of view. It is a new, (unexpected for me, I must say), happy and brilliant chapter to our clinical and developmental works (from the letter of Vygotsky to Luria on 1.8.1931 — underlined by L.S. Vygotsky) (Puzyrey, 2004). Vygotsky did such a conclusion concerning the report of Luria about the expedition in Uzbekistan: "In another cultural environment another psychology" (Vygotsky, 2017, p. 222).

This is also the basis for Luria's neuropsychology. "For Luria the brain was an instrument for making culture accessible to mind. … for him the "internal-

ization of culture" was a mastering of possible worlds" (J. Bruner, 2005, p. XII). With any doubts, Vygotsky and Luria were the pioneers in cross-cultural studies that became very popular from the 1950th. For instance, it was shown that different languages conceptualize the world in a different way (Whorf, 1956). Significant variations in the patterns of cognitive abilities across national and cultural groups have been described in psychology, anthropology, and neuropsychology (Koshmanova, 2007; Kan, Wicherts, Dolan, & van der Maas, 2013; Gangestad & Simpson, 2016; Matsumoto & Juang, 2016). Ecological conditions and cultural practices are significantly associated with the development of perceptual, spatial, and constructional skills (Cole & Means, 1986). For instance, Rosenqvist, J. et al. (2017) examined language, face memory, emotions recognition, theory of mind, and visuospatial processing in 3-to 15-year-old children from three countries: Finland, Italy, and the United States. The authors revealed significant differences in performance on the tasks between the countries. The differences were more pronounced in the younger than in older children. Furthermore, some subtests showed greater country effects than others. One can expect larger differences with non-western cultures. The study by Polyakov, V.M., Kolesnikov, S.I., Rychkova, L.V. (2017) found periods of sensibilization in child development to environment influence. Such an influence proved to be related with interhemispheric interaction (Nikolayeva, Grekova, 2017) Tikhomirova, T.N., Lysenkova, I.A &, Malykh, S.B. (2017) revealed specific interrelations between cognitive functioning and academic success in schoolchildren in different countries. With this, schooled subjects significantly outperform illiterate individuals in cognitive testing, and schooling can be regarded as a sub-culture itself (Berry, 1979; Ardila, 1995, 2016). Cornelious, S. and Caspi, A. (1987) found that educational level has a substantial relationship with performance on verbal meaning tests but is not systematically related to everyday problem solving

All these data of contemporary cross-cultural studies confirm the statement of Vygotsky that " in the process of historical development the social man [obshchestvenny chelovek] changes the methods and devices of his behavior, transforms natural instincts and functions, and develops and creates new forms of behavior — specifically cultural" (Vygotsky, 1997, p. 18).

Luria wrote in his book: "Our study was performed in the peripheral parts of Uzbekistan: in kishlaks (small Asian villages) and djailau (mountain pastures). The similar results could be received in peripheral villages of Russia, in northern minorities or in herdsmen of the northeast of Siberia" (Luria, 1974, p.3). The last was exactly the task of our study.

Methods

A group of psychologists from Moscow, Belgorod and Petropavlovsk Kamchatsky Universities performed an integrated psychological study of endogenous populations of the north of Kamchatka peninsula living in almost inaccessible (only with helicopter or armored carrier) regional centers or nomadic herdsmen in tundra. The *aims* of the expedition were to compare cognitive functions and life attitudes by nomadic and settled subgroups of endogenous peoples from the point of view of social nature of human mentality and conscience.

Kamchatka is a polyethnic region and all inhabitants of Kamchatka have a long historical experience to live in a polyethnic environment. The figure 1 illustrates the ethnic distribution in the studied population of subjects.

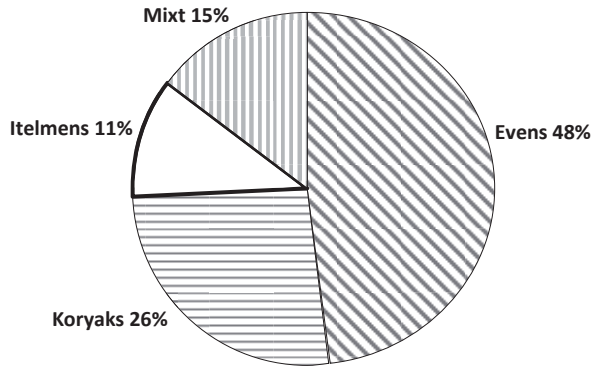

Figure 1. Ethnic distribution in the studied population of subjects

Thirty *subjects* (17 men and 13 females) (10 nomadic herdsmen and 20 inhabitants of villages) were assessed using the same tests on classification and generalization, as Luria did, together with Luria neuropsychological battery, and projective drawings. All subjects (both nomadic and settled) had primary education in Russian schools.

The Table 1 shows gender and age distribution of subjects.

Table 1. Subjects characteristics

Gender distribution		**Age distribution**			
Male	Female	5–12	21–30	33–48	49–55
17	13	20%	26.7%	23.3%	30%

The assessment included the following *methods*:

- Comprehensive Luria's neuropsychological assessment, including Schulte's test (or proof test for preschoolers) to measure level of brain activity and of attention; motor tests (dynamic, kinesthetic, spatial, regulatory praxis, reciprocal coordination and drawing); tests on visual and spatial gnosis; tests on visual and motor memory; tests on expressive and impressive speech and writing; intellectual tests (understanding of verbal and pictured stories, tests on generalization, arithmetic problems solving) (Luria, 1973);
- Profile of hemispheric lateralization (Annett, 1970);
- Verbal fluency test (Benton et al., 1983);
- Pictures classification test (Luria, 1974);
- Luria's test of free questions (Luria, 1974)

- Projective drawing (free drawing — "what do you want to share with me" and "your representations of happiness (joy), grief, friend, enemy»). We did not analyze the quality of the drawings but only the titles given to each drawing.

Results

Let's analyze first the main results of neuropsychological assessment (Table 2).

Table 2. Significant differences in neuropsychological tests between nomadic herdsmen and villages inhabitants (% of symptoms in each subgroup)

Symptom	Inhabitants of villages	Nomadic herdsmen
Instability of brain activity	33%	25%
Defects of dynamic praxis (perseverations, stereotypes)	10%	100 %
Defects of reciprocal coordination of movements	0	25%
Deficiency of visual memory	33%	75%
Deficiency of motor memory	22%	75%
Difficult story successive retelling while its good comprehension	37%	50%
Situational generalization instead of categorical	0	25%

We can see that in general, the results of neuropsychological assessment were worse in the subgroup of nomadic people to compare with village inhabitants with one exception for the symptom of instability of brain activity. In both subgroups, the subjects had good space representation, kinesthetic functions, and all gnostic functions. Nevertheless all subjects were bilingual; there were no defects of naming.

I all subjects we have determined the profile of *hemispheric lateralization*. The distribution was normative: 29 right handed and 1 left handed. However, it was shown in our previous studies (Danilova et al., 2016), that human laterality - a preference or higher locomotive or sensor performance — is a multidimensional trait, and crossed laterality, especially intermodal (sensor-motor) has negative effect on cognitive functioning.

Table 3. Types of crossed laterality (% of subjects in each subgroup)

Inhabitants of villages		Nomadic herdsmen	
Intermodal crossed laterality	**Intramodal crossed laterality**	**Intermodal crossed laterality**	**Intramodal crossed laterality**
37%	63%	25%	75%

Intermodal crossed laterality was more frequent in village inhabitants than in nomadic herdsmen: so, in the last ones the lateral differentiation of mental functions was more definite (Table 3).

Verbal fluency test revealed a predominance of semantically mediated verbal associations (plants) on general verbal activity in both subgroups of inhabitants of Kamchatka. With this, the verbal fluency was greater in village inhabitants than in nomadic herdsmen (Table 4). Both facts are a very evident evidence of social life conditions on cognitive functioning.

Table 4. Verbal fluency differences (middle number of verbal associations per minute)

Inhabitants of villages		**Nomadic herdsmen**	
General verbal activity	**Semantically mediated verbal associations**	**General verbal activity**	**Semantically mediated verbal associations**
27	32	22	25

The results of *pictures classification test* were very similar to those described by A.R. Luria (1974). As well as illiterate inhabitants of Central Asia, the nomadic herdsmen with primary school education did situation-based generalization instead of categorical one. For instance, a picture of a hat is in the same group with a man and a dog, because "a man wears a hat, which is done from a dog". A man is put together with the objects, that are fabricated by him or with domestic animals, while wild animals are excluded from this group. A thermometer is unified with a baby, a book with a table, or a horse with a physician, because it can be a veterinary which treats the horse. It reminds the example of Luria: "You can't put together a bottle and glasses, because they rust. You have to cover them with paper" (Luria, 1976, p.64).

This tendency for situation-based generalization was more pronounced in nomadic herdsmen, than in village inhabitants with the same level of education. So, the practical life conditions are more important for reasoning functioning than the level of education.

The results in Luria's *test of free questions* ("Ask me any 3 questions") were quite different from Luria's data. The illiterate people living in the peripheral parts of Uzbekistan refused to put any questions or asked only practical questions (like: "My horse is stolen, how to get for long distances?"), without motivation to receive some new knowledge. The nomadic inhabitants of the peripheral parts of Kamchatka put different questions: "Does the monument to Lenin in Moscow still exist?", "What is new in clubs?", "Are the old buildings repaired in the city?" and so on. These data reflect the radical changes in cultural and educational level of people of Kamchatka.

An *analysis of projective drawings* revealed some common features and some age differences. A common feature for all age groups was a feeling of unity with nature. All free drawings included nature with a very positive attitude to it. A friend is tundra, river, a wild animal from tundra or a good hunter. Small children who live permanently in villages draw as a friend a computer or a schoolmate. An enemy is

an enemy of nature, technical means (for adults), alcohol, drugs, smoking, war, a lazy person, a week person, a hunter on a helicopter, a fire in tundra. If the inhabitants of the central regions of Russia associated happiness with money (Obukhova et al., 2017), no one from Kamchatka actualized happiness as financial values, even more, some of inhabitants of Kamchatka considered money (credit) to be a grief, in the same line as an illness of a relative, a fire, death, war, aggression, solitude. By contrast, the happiness is the life; "to lay on the grass in the forest, looking the stars on the sky, in silence and peace"; the birth of the child; family, harmony; sun.

We compared free drawings of 5-12 years old children from Kamchatka villages with drawings of urban children from central regions of Russia, matched by age and gender (Obukhova et al., 2017):

- Urban children have larger social experience, than rural Siberian children do: such topics as roller skates, a cruise with mam, a visit to delphinium, TV heroes, animals from tales and so on.
- The attitude to nature of Kamchatka children is positive, that of urban children is more negative, for instance, the volcanos were present in many drawings by Kamchatka children, but only a boy from Moscow drew an erupting volcano.
- The urban children do more polychromic drawings with more details than rural children do.
- The rural children unlike urban ones did not represent humans in their drawings.
- The animals in rural children drawings are realistic, those from urban children drawings are anthropomorphic (in human clothes, on two legs, in human situations, like a New Year party).
- Urban children from central regions of Russia often draw different arms (bomb, tank, gun), not represented in any rural drawing. It indicates a greater aggressivity of urban children.
- Urban children drawings are more introspective than in rural children: often the titles of drawings include such words as "I want…", "I love…", "I will be …"

So, we see the influence of social conditions on cognitive functions and life attitudes and values both in adults and in children.

Conclusions

The cultural-historical approach forces us to reconsider the concept of the social brain as a social and cultural determinant and regulator of brain functioning (Glozman & Krukov, 2013).

The cooperation of outstanding psychologists L.S. Vygotsky and A.R. Luria on theoretical, experimental, and clinical work was an historic event, a scientific phenomenon, and a turning point in the development of psychological science (Glozman, 2016)/

"The pioneer research proposed and carried out by Luria and Vygotsky in Uzbekistan, over 70 years ago, and the concept of extracortical organization of higher

mental functions, has become particularly important in the understanding of cultural differences in cognition" (Kotik-Friedgut & Ardila, 2005, p. 57). It was proved first by research in Central Asia and in 85 years later by the described expedition in Kamchatka.

In the conclusion to his book Luria (1974) indicates, that his colleagues often advised him to repeat this study in 40 years, but the author did not considered it reasonable, as radical changes in cultural and educational level of Asia population must equalize the differences in cognitive processes with people from central regions. However, in the 1930th Luria's neuropsychological battery still did not exist. The comprehensive Luria's neuropsychological assessment permits to reveal socially determined differences of cognitive functioning between nomadic herdsmen and rural inhabitants with the same level of education, such as: successive organization of movements and actions, vocabulary, visual images, generalization processes and more. It correlates with Peter Tulviste finding that the effects of schooling decreased over the years (Tulviste, 1978).

The life attitudes and values of inhabitants of Kamchatka, living in specific and difficult life conditions, differ from those in people from central regions of Russia. Namely, they realize the unique character of own culture, national values and common interests of own ethnic group with others living at the same place.

"It is already a challenge to understand the past while living in a different world …This is also a framework in which Vygotsky's time and theory are to be understood as hermeneutic tools for understanding ourselves, our scientific theories and, most importantly, our societies and cultures that shape us as we shape them" (Jovanović, 2015, p.29-30). "And, again not surprisingly, we became newly aware of the subtle and powerful relationship between mind and culture" (Bruner, 2015, p. 9).

Limitations

In our expedition there were a limited number of independent study samples with a wide variation in the methodologies used across studies. These findings can inform future studies and prove the validity of cross-cultural studies nevertheless the changes in cultural and educational level of national minorities.

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Value shifts in Vietnamese students studying in Russia

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Background. The extension of intercultural contacts in the present-day world calls for a thorough study of what effect these contacts produce on the human personality. When an individual is suddenly immersed in a different culture, his or her consciousness becomes a battlefield where new values conflict with the old. The person experiences an axiological shock, a ``value clash," which urges him or her to undertake a re-examination of his/her value system as a whole.

Objective. The objective of this study was to determine the changes occurring in the value system of Vietnamese students obtaining their higher education in Russia.

Design. A longitudinal study was performed involving 100 Vietnamese students in Russian universities. The measurement methods used in the study were: 1) the modified M. Rokeach Value Survey (Rokeach, 1973; Kudrjashov, 1992), in which the original set of values was expanded by 20 additional values typical of the Vietnamese people; and 2) the technique for assessing acculturation strategies developed by J.W. Berry (*Strategii mezhkul'turnogo vzaimodejstvija*..., 2009).

Results. In the course of a year of residence in Russia, specific changes (or "shifts") occurred in the value systems of the Vietnamese students which proved to be statistically significant. Among the goal values (the same as terminal values, in the terms of M. Rokeach) which took on more weight were *Productive Life* and *Materially Prosperous Life*, while among instrumental values, *Tidiness* and *Frugality* became more prominent. A difference between the value dynamics in male and female students was also established, with the value pattern of male students proving to be more dynamic. The next finding was the difference in value dynamics between students coming from urban and rural settlements. There was one more quite unexpected finding: The value pattern changed more noticeably in respondents with an acculturation profile of *"Integration and Separation,"* than in those with profiles of *"Integration and Assimilation"* and *"Pure Integration."*

Conclusions. Therefore we see that factors such as gender, type of environment (rural/urban) the individual comes from, and the strategy of acculturation used by the individual, act as mediators exerting their own influence upon the dynamics of his/her value patterns.

Abbreviation: PF = Preliminary Faculty

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Keywords: acculturation, value pattern, value dynamics, Vietnamese students, acculturation strategies, acculturation profile.

Introduction

The extension of intercultural contacts in the present-day world calls for an emphasis upon a thorough study of what effect these contacts produce on the human personality. Values constitute the core of every culture. Through the process of enculturation, they become the major component of personality, and serve as its compass, its navigator, and determinant of the individual's stance toward the world. The value pattern is a rather stable component of personality. It is a construction which helps the personality take a certain position toward the whole outside world with all its challenges (Leontiev, 1993). At the same time, the personal value system is rather changeable, since it is a derivative of the ever-changing environment, on one hand, and of the actual level of personal development, on the other (Yanickyi, 2012).

When an individual finds him- or herself immersed in a remote culture, which is very different from his own–so strange and alien to him, full of unfamiliar norms, rules, and concepts, and above all, very largely based on another set of values–he or she is plunged into a state of value chaos and confusion. In making the horrifying discovery that the familiar values (both common and personal), which he or she "absorbed with one's mother's milk," are now coming into a clash with the completely different values of the residential population, and that his or her explanatory models do not work here at all, the person may undergo an axiological crisis, or axiological shock. In the individual mind, the two sets of values, the new ones and the old, clash — a very painful condition, often producing panic or depression. To overcome such a crisis, one needs to indulge in a total re-examination of his or her value system as a whole. This extremely tense and difficult task may become the first step to establishing a set of modified personal values for the individual.

How will the values change? What factors affect the process of value changing in the course of the acculturation process? The phenomenon of value shifts in a changing social environment has been studied well enough in connection to dramatic changes in socio-economic and political life (e.g. Zhuravleva, 2013; Lebedeva & Tatarko, 2007; Le, 1998), but the problem has not been studied very much in the context of acculturation. The study of value dynamics in young people coming to our country from a culture very distant, in every respect, from our own, seems to us to be a great model for research in this field. These young people provide a vivid example of how values may change under the cross-cultural interaction and radical immersion into another culture, particularly in light of the fact that university students are notable for their great sensitivity to social influences, and that the problem of personal values is very acute at this age.

Methods

The empirical study we carried out, in collaboration with Duk T. Bui, was aimed at detecting changes in the value system of Vietnamese students during their study in Russia.

The more specific aims were as follows:

1. Detect changes in the value system of Vietnamese students during their early period of study in Russia.
2. Make a comparison between the value dynamics in Vietnamese male and female students.
3. Compare the value dynamics in Vietnamese students coming from urban and rural settlements.
4. Compare the value dynamics in Vietnamese students with different strategies of acculturation.

Sample: 100 Vietnamese students in Moscow colleges and universities, who had a mean age of 21 at the beginning of the study. 54 subjects were female and 46 male; 52 came from urban and 48 from rural settlements.

A longitudinal method was applied in the study. Two measurements were taken of each student precisely at a one year interval. The first measurement was taken when the subjects were attending preliminary courses (Preliminary Faculty or PF), designed mainly for foreign students to study the Russian language, at which time their living experience in Russia had been four months on average. The second measurement was taken exactly a year later, when they were students of the first course, and had experienced living in Russia for 1 year and 4 months.

The main measuring instrument applied in this study was the modified M. Rokeach Value Survey (Rokeach, 1973; Kudrjashov, 1992). For the purposes of this study, we extended Rokeach's value list by adding 20 more values peculiar to the Vietnamese people, which had been identified in a number of studies by Vietnamese scholars (Le, 1998; Ho, 2010; Phạm, 2012). We added 15 "traditional" and five "conditionally contemporary" Vietnamese values, seven of which belonged to the category of "terminal" or goal values (*Homeland, Peace, Humanity, Justice, Equality*, and *Following Traditions*), and 13 of which belonged to the category of "instrumental" values (*Industry*; *Modesty*; *Self-Esteem*; *Respect for the Elderly; Simplicity; Construction of Relations Based on Personal Emotional Bias; Gratitude; Frugality; Fidelity; Contemplativeness; Collectivity; Spirit of Community, Solidarity, Mutual Love and Interconnection, and Ideals of the Revolution*). To assess acculturation strategies, we used the technique developed by J. W. Berry (*Strategii mezhkul'turnogo vzaimodejstvija...*, 2009), which aimed to identify four strategies of acculturation, known as *Assimilation*, *Separation*, *Integration*, and *Marginalization*.

We also used various mathematical statistical methods (Wilcoxon T-criterion, binomial criterion, and a method of cluster analysis) for statistical data verification.

Results

Figures 1 and 2 represent the dynamics of the terminal and instrumental values among the students. As one can see, the average meanings, weight, and ranking order of some values changed after a year of study in Russia. We have written about some aspects of our study in previous publications, where we analyzed the changes

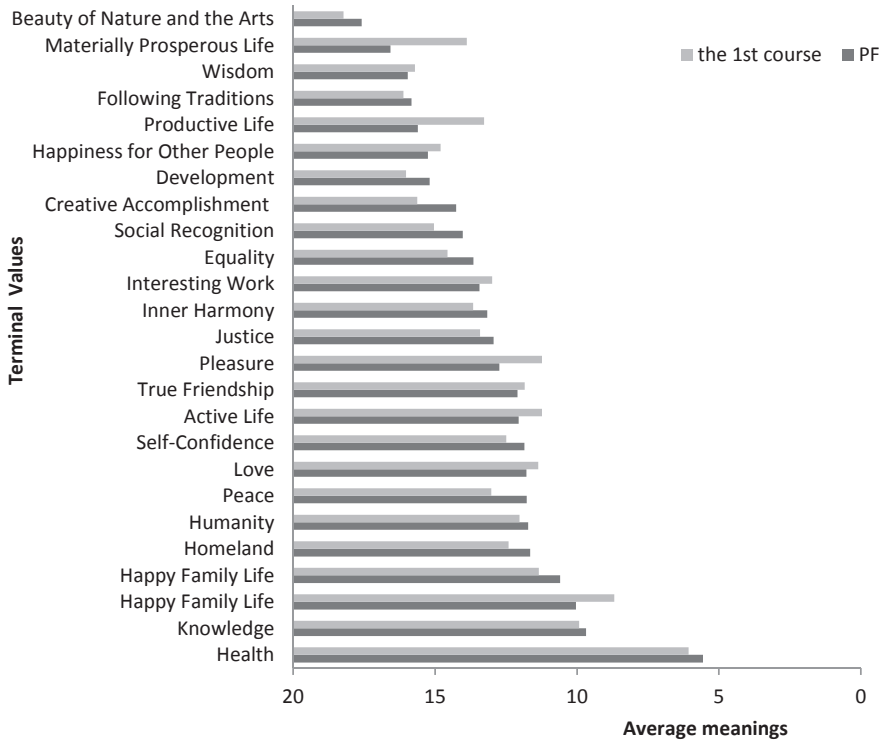

Figure 1. Terminal value dynamics in Vietnamese students after the first year of study in Russia

Note. The numbers above the columns indicate a range for each value. Statistically significant shifts were found in two values, *Productive Life* and *Materially Prosperous Life.*

in ranks and hierarchic structures of the most prominent, high-rank values in detail (Maslova & Bui, 2014). In this paper, we focus attention on the statistically meaningful value shifts, revealed by the means of Wilcoxon T-criterion.

After a year, the statistically most prominent change was the increase in the adoption of the values *Productive Life* ($p<0.05$) and *Materially Prosperous Life* ($p<0.01$). At the tendency level, one can see the increased weight given to the value *Pleasure,* and decreased weight given to the values *Peace* and *Creativity*.

Thus, we may state positively that after a year of study in Russia, some significant changes took place in the value pattern of the Vietnamese students. An individualistic principle was strengthened in the goal values, while in the set of instrumental values, some of the Vietnamese people's traditional values increased in significance, too.

We asked whether there were some differences in the value dynamics between male and female Vietnamese students. In Figure 3, one can see which values showed a gender differentiation.

As seen from Figure 3, statistically significant shifts in the value pattern of male students occurred in both terminal and instrumental values. The values of *Materially Prosperous Life* ($p<0.05$) and *Responsibility* ($p<0.05$) increased in significance

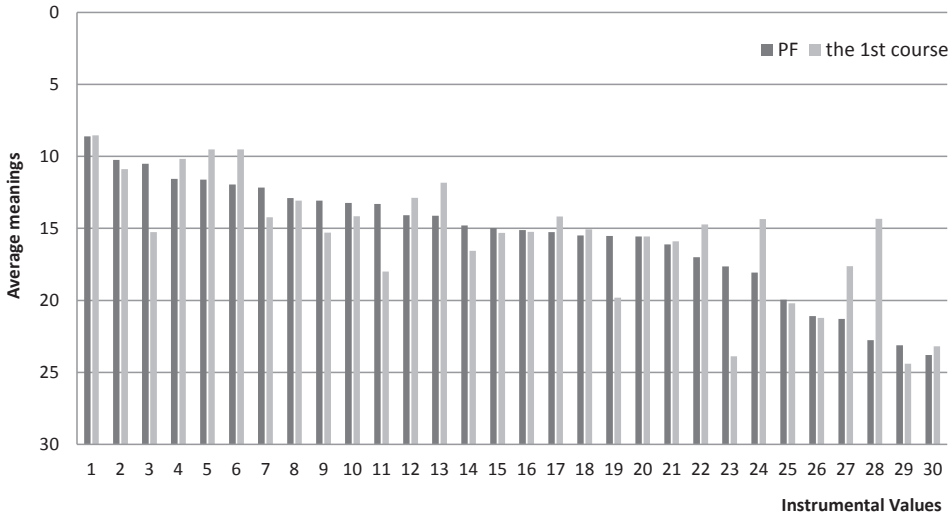

Figure 2. Instrumental value dynamics in Vietnamese students after one year of study in Russia

Note. The numbers above the columns indicate a range of each value. Underlined in the list below are the values whose change proved statistically significant. Columns 1 to 30 represent these Instrumental values: 1. Education; 2. Good Manners; 3. Spirit of Community, Solidarity, Mutual Love and Interconnection; 4. Cheerfulness; 5. Responsibility; 6. Tidiness; 7. Modesty; 8. Industry; 9. Broad-Mindedness; 10. Gratitude; 11. Courageous Standing Up for Your Beliefs; 12. Collectivity; 13. Independence; 14. Simplicity; 15. Fidelity; 16. Tenderness, 17. Honesty; 18. Effectiveness; 19. Rationality; 20. Strength of Will; 21. Tolerance; 22. Frugality; 23. Contemplativeness; 24. Self-Esteem; 25. Ideals of the Revolution; 26. High Aspirations, Ambitions; 27. Self-Control; 28. Respect for the Elderly; 29. Fight against Imperfections in Yourself and in Other People; 30. Construction of Relations Based on Personal Emotional Bias.

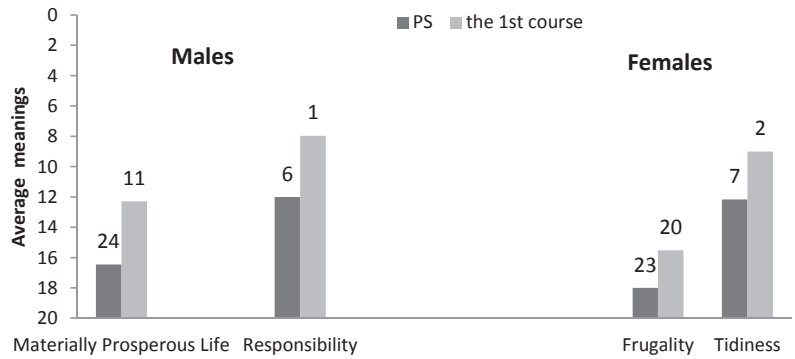

Figure 3. Statistically significant value shifts in male and female students. The numbers above each column stand for the ranking of the value

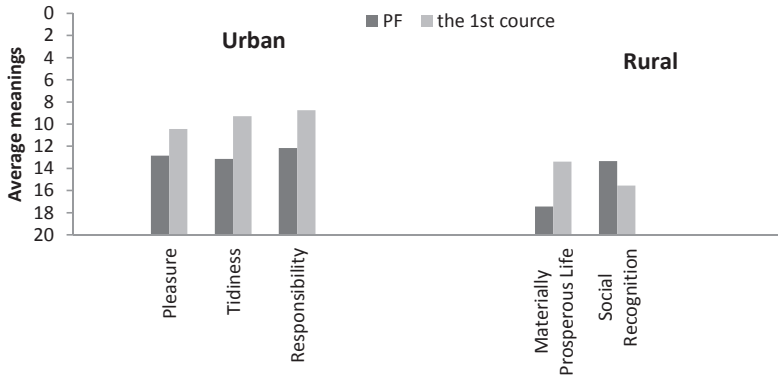

Figure 4. Statistically significant value shifts in students coming from urban and rural settlements. Numbers above each column stand for the rank number of value

for them over the course of the year. In female students, goal values proved more stable, and only tool values displayed a shift–*Frugality* and *Tidiness* ($p<0.05$ for both).

One of the aims of this study was to compare the value dynamics between students according to whether they came from a town or a village. Figure 4 shows the changes in value patterns of these two parts of the sample.

We see that students of both urban and rural origin change some of their personal values under the influence of a new culture. Their values shift in the direction of strengthening individualistic values, and decreasing values of a collectivist type, but these changes differ in quality. The students of urban origin become more interested in the terminal value of *Pleasure* ($p<0.05$), and they become more oriented toward the instrumental values of *Responsibility* ($p<0.05$) and *Tidiness* ($p<0.05$). By contrast, students coming from villages become more oriented towards the *Materially Prosperous Life* ($p<0.01$). This result means that the acculturation process dif-

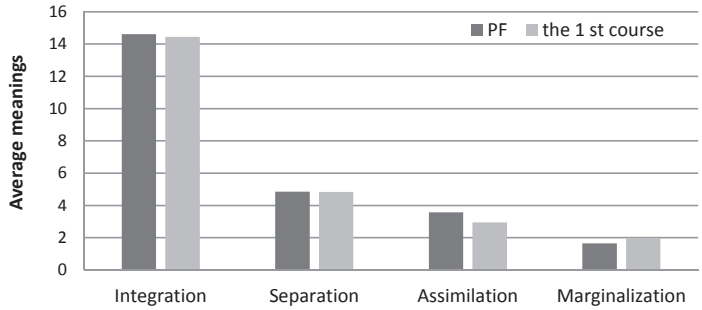

Figure 5. Relative strength of acculturation strategies found in Vietnamese students

fers for rural and urban students. They pay attention (to some extent) to different aspects of life, and tend to attach different weights to their personal values (Maslova & Bui, 2014).

The survey's next objective was to examine the value dynamics in the students according to their different acculturation strategies. Figure 5 shows the average intensity of the four strategies described by Berry et al. (2002) in our sample of Vietnamese students.

We proceeded from the assumption that the value orientation pattern would change most dramatically in students using the *Assimilation* strategy, and that minimal changes would be found in those using the strategy of *Separation*. In order to check this hypothesis, we applied Berry's technique to all the respondents. As a result, we assessed the acculturation strategy used by each student. But our intention to divide the sample according to the four types of acculturation could not be completed because 100 per cent of the respondents had the same predominant strategy–the strategy of *Integration*.

Nevertheless, the proportion of other strategies the students used varied to a certain extent, so we found it helpful to examine this proportion. With the use of cluster analysis, we divided the sample into three groups according to the relative expression of all four strategies (Figure 6). Now we could see the specific proportion of the four acculturation strategies in each individual, as well as in the sample as a whole. We refer to this inner proportionality as an *acculturation profile*.

According to the pair of strategies most prominent in each individual (keeping in mind that the strategy of *Integration* remained the guiding principle in all cases), we were able to designate three main acculturation profiles, as follows:

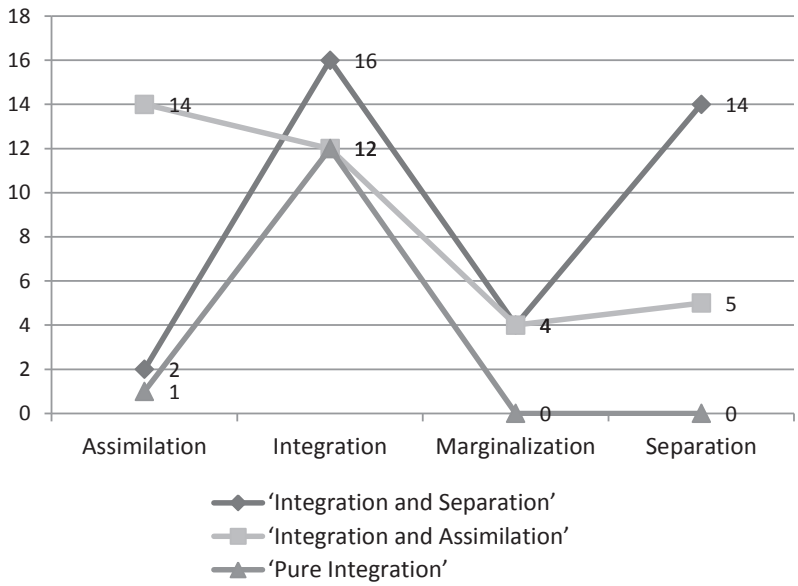

Figure 6. Acculturation profiles of the Vietnamese students

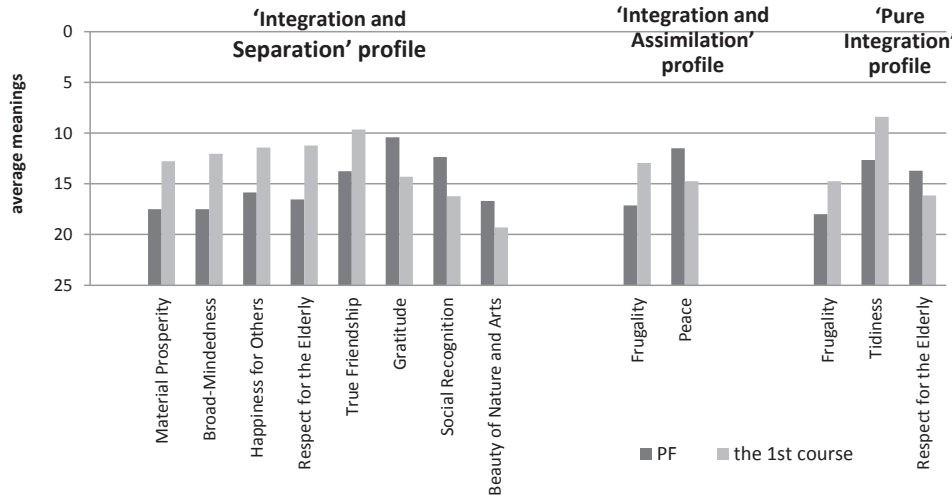

Figure 7. Statistically significant value shifts in students with different acculturation profiles

- *Pure Integration* (found in 50 per cent of our respondents);
- *Integration and Separation* (found in 26 per cent of respondents), in which the general intention for integration with a new culture in some cases alternated with a separation tendency;
- *Integration and Assimilation* (found in 24 per cent of respondents), in which the general intention for integration with a new culture in some cases alternated with an assimilation tendency.

Analysis using the binomial criterion showed that the above three types of acculturation profile were equally common in male and female respondents, and in urban and rural students as well. The presence of a fourth strategy, *Marginalization,* did not show up in the sample to any significant degree.

The dynamic of value changes in subjects with different profiles was a surprise for us. The quantity of value shifts was most prominent (average=8) in the respondents with the *Integration and Separation* profile, leaving the owners of other profile types far behind. Only three shifts on average were found in students with the *Pure Integration* profile, and only two in students with the *Integration and Assimilation* profile. That result means that the value system in students with the profiles of *Pure Integration,* and *Integration and Assimilation,* proved more stable than in those with the *Integration and Separation* profile.

Figure 7 represents the spectrum of value shifts in respondents with all types of acculturation profiles. One can clearly see that in respondents with the *Pure Integration* profile, the significant shifts affected only instrumental values. They displayed an increased ratio of *Tidiness* ($p<0.01$) and *Frugality* ($p<0.05$), and a decrease of *Respect for the Elderly* ($p<0.05$). In students with an *Integration and Assimilation* profile, some shifts were seen not only in tool values, but in goal values as well. The weight given to *Frugality* increased in their value system ($p<0.05$), while the *Peace* value went down ($p<0.05$).

The most prominent value shift is seen in the subjects with the profile type of *Integration and separation*. The diagram shows the increase of such values as *Broad-mindedness* ($p<0.01$), *Respect for the Elderly* ($p<0.01$), *True Friendship* ($p<0.05$), *Material Prosperity* ($p<0.05$), and *Happiness for Other People* ($p<0.05$). At the same time, a decrease is seen in the values of *Gratitude* ($p<0.05$), *Social Recognition* ($p<0.05$), and *The Beauty of Nature and Arts* ($p<0.05$).

Discussion

How could it be that the system of value orientations changed in a more dramatic way in those students who were less open to a new culture, as compared to that of those who were more inclined towards intercultural relationships? Qualitative analysis of the whole body of data suggests that it could be due to the fact that the students belonging to the group *Integration and Separation* are more sensitive to acculturation distress; they feel more upset by the "value clash" and try to resist the upcoming changes.

In this painful situation, they need more attention and friendly concern, including support from their family members, friends, and compatriots. Maybe this need for support stands behind the fact that the values *True Friendship* ($p<0.05$) and *Respect for the Elderly* ($p<0.01$) had increased noticeably in this group of respondents. They may more often compare their native culture with the new one, discuss the differences, and reflect upon the new situation. This kind of reflection may be useful in the process of reassembling their whole value system. It may also be important that the instrumental value *Broad-mindedness* has increased in this group ($p<0.01$), indicating a willingness to understand another people, and to respect their habits and customs.

On the other hand, respondents with the profiles of *Pure Integration,* and *Integration and Assimilation,* feel themselves more confident and independent in a new culture; they can rely on themselves in complex circumstances. So, in the students with a profile of *Pure Integration*, the values *Respect for the Elderly* ($p<0.05$) and *True Friendship* ($p<0.01$) decreased in their significance, but growth was found in *Responsibility* ($p<0.1$) and *Effectiveness* ($p<0.1$).

All this is only a hypothesis. For a more confident answer to the question "Why did the students with more flexible and open acculturation strategies tend to have more stable value systems than the students who were inclined to more restrained acculturation strategies?" , an additional study may be required.

Our results are consistent with earlier findings of gender differences in the process of adaptation to a new socio-cultural environment in Latin-American students (Maslova & Tapia, 2012; Maslova, 2012), where female students showed a greater adherence to traditional values than males in the same communities.

It would be of interest for us to compare our results with the results of other studies of dynamics of personal values in Vietnamese people, but we could not find any longitudinal study on this matter. The only one close to our topic was a paper by K. Sh. Le (1998), who studied the changes of values in Vietnamese people in the course of time by comparing subjects of different ages. This author used the

Rokeach method, just as we did, but unlike us, he conducted his study on subjects resident in Vietnam, but belonging to different generations.

In his study, K. Sh. Le revealed a greater incidence of individualistic tendencies in young people as compared to the elderly of population in Vietnam, along with a decrease in some kinds of traditional values, such as *Frugality* and *Respect for the Elderly;* these lost their significance among the young generation, and even tended to be rejected in this strata (Le, 1998). As shown above, we found a similar tendency in the subjects of the present study, after a year of their living in Russia and studying in Russian universities. We found a significant increase of individualistic values in these subjects (such as *Materially Prosperous Life* and *Productive Life)*, but at the same time, no decrease was found in traditional Vietnamese values such as *Frugality* and *Tidiness*. Moreover, their presence became more prominent in the subjects of our study, as shown in Figure 2, while another traditional value, *Respect for the Elderly,* displayed different types of dynamics depending on the acculturation profiles of our subjects (see Figure 7).

This dissociation between the results of the two studies may be due to the difference in the initial experimental conditions. Namely, Le conducted his study among Vietnamese residents belonging to different generations, while our own study was comprised of a sample of the same age, i.e. young Vietnamese students who were separated from their native soil and had the urge for acculturation to a completely new cultural environment. We may therefore assume that our study was rather innovative in its specific combination of objective and method, especially in this country.

Conclusions

The present study enables us to draw the following conclusions:

1. In the course of acculturation of Vietnamese students in Russia, the significance of personal goal values, primarily *Material Prosperity* and *Productive Life,* has increased in a significant way, as well as some tool values (*Tidiness* and *Frugality*) traditional in the Vietnamese people.
2. Gender serves as a mediating factor partially determining the value dynamics. The value system of male students is more dynamic, with changes affecting both their goal and tool values. In female students, only tool values were affected by changes due to the acculturation process.
3. The subjects' original living environment (urban or rural) is another factor mediating the value shift. Students from towns and villages turn their attention to different types of new cultural values, and adopt them in different ways. The town-born students begin to pay more attention to the *Pleasures* value, while those coming from villages turns mostly toward a *Materially Prosperous Life*.
4. The acculturation profile is one more factor mediating the personal value dynamics. The value system of students with an *Integration and Separation* profile changed to a larger degree than that of students with profiles of *Integration and Assimilation,* and *Pure Integration*.

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Neuropsychological analysis of the features of mental development in school age children with mild perinatal hypoxic damage of the nervous system in their anamnesis

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Background. Perinatal pathology of the nervous system (PPNS) of hypoxic genesis is one of the most significant causes of deviations in mental development. It is necessary to investigate the impact of mild PPNS for the child's mental ontogenesis, because coarser perinatal lesions, as a rule, lead to significant violations of development and should be analyzed separately. From our point of view, the qualitative neuropsychological syndromic analysis adopted in Russian child neuropsychology is the most productive way to study this problem.

Objective. The purpose of this study was to conduct neuropsychological analysis of the features of mental development of school-age children with mild hypoxic PPNS in their anamnesis.

Design. Our research involved 62 children 10-12.5 years old, who were studying in comprehensive schools in Moscow. The main group was comprised of 42 neurologically healthy children who had hypoxic-ischemic encephalopathy of mild severity in their anamnesis. The control group was comprised of 20 neurologically healthy children without indication of pathology of pregnancy and labor in their anamnesis.

Methods. We used neuropsychological Luria tests that have been adapted for children, conducted an interview of parents and teachers about the peculiarities of children's behavior, and analyzed electroencephalogram reports.

Results. Every child with PPNS exhibited similar features, such as neurodynamic disorders and a lack of voluntary control. We called this symptom complex "subcortical-frontal" neuropsychological syndrome. In addition, each child in the main group had a failure of at least one neuropsychological factor. The following functions showed insufficiency most often: voluntary attention, speech development, verbal-auditory memory, kinetic and kinesthetic praxis, visual-spatial gnosis, and phonemic hearing. Left hemisphere functions and interhemispheric interaction suffered to a greater degree. The children with PPNS were divided into two subgroups, depending on the severity of the insufficiency of executive functions (EF). Children with severe insufficiency of EF more

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frequently demonstrated violation of development of verbal-logical thinking, difficulties in social adaptation, emotional disorders, and deviant behavior.

Conclusion. The mental development of school-age children with mild PPNS in their anamnesis differs from the development of their peers. We can talk about the long-term consequences of mild hypoxic perinatal damage of the nervous system.

Abbreviations. PPNS — perinatal pathology of the nervous system; CNS — central nervous system; EEG — electroencephalogram; EF — executive functions.

Keywords: perinatal hypoxic damage of the nervous system; child neuropsychology; cultural-historical concept; neuropsychological analysis; school-age children.

Introduction

At present, many specialists who work with children and adolescents (psychologists, educators, defectologists, etc.) note that the mental development of children today shows a number of significant differences from that observed several decades ago. Perhaps only "cabinet scientists", who do not have the practical experience of interaction with children in actual conditions, can't see that today the "psychological portrait" of a child at different age levels differs from that described in the "classical" psychological and pedagogical literature. "The child did not become worse or better than his peer of twenty years ago; he just became different" (Feldshtein, 2010, p. 6). Most likely, the general patterns of mental ontogeny, the vectors of development, remain unchanged. However, the meaningfulness of the stages of development, the formation of behavior and the cognitive-operational sphere, and the formation of the child's and his/her social connections, have undergone significant changes.

From the cultural-historical point of view, which is fundamental to Russian psychology, this is to be expected: the child's mental ontogeny is largely determined by the social situation of development (Vygotsky, 1984), which has changed significantly over the past decades (Sultanova & Ivanova, 2010). The social situation of development is a special combination of internal development processes and external conditions, typical for each age level (Bozhovich, 2008).

At present, both major components of the social situation of development have been modified. First of all, there are the *external* conditions: over recent decades, rapid changes in all spheres of human life have occurred in our country (as well as all over the world). Economic, political, and socio-cultural modifications have led, in particular, to transformation of the patterns of family formation, marriage, and the conditions of family upbringing, as well as changes in the information environment, changes in the sphere of education, and modification of children's ways of life.

The *internal* components of the social situation of development have also changed. First of all, there is the state of children's neuropsychiatric and somatic health. The prevalence of basic forms of children's mental illnesses grows by 10-15% every ten years; neuro-mental illnesses cause child incapacity in 70% of these cases (Feldshtein, 2010). Specialists assume that over 80% of children now need some psychological, psychotherapeutic, or psychiatric aid (Shevchenko, 2011). The number of absolutely healthy children among modern first-graders is 4.3%, which is half as much as at the end of the last century (8.7%) (Golikova, 2010). Therefore,

the task of improving the somatic and mental health of children in Russia, and in many other countries also, is of great priority.

In our view this problem cannot be resolved without analyzing children's perinatal development. The high prevalence of perinatal pathology is of particular concern. Normal pregnancy and childbirth without pathology have become an exception to the rule. For example, according to the Russian Ministry of Health, the percentage of normal births does not exceed 36.8% (Golikova, 2010). Thus, we have to conclude that the development of most children today takes place against the backdrop of a lack of health. Meanwhile, the problem of how general state of health, and, in particular, perinatal disorder, affects the mental ontogeny, has not been adequately researched.

Perinatal pathology of nervous system (PPNS) is one of the most important causes of deviations of ontogenesis. "Adverse pregnancy and childbirth have often more detrimental effects on the nervous system and the human psyche than endo- and exogenous factors in the postnatal period" (Palchik & Shabalov, 2013, p.7). In the medical literature there are rather contradictory data on the prevalence of PPNS. According to different authors, it varies from 45 to 86%, and the leading role in the genesis of PPNS belongs to hypoxia (Barashnev, 2001; Volodin, Medvedev, & Rogatkin, 2001; Studenikin, Maslova, & Khachatryan, 2003; Shabalov & Tsveleva, 2002). Numerous maternal infectious and chronic diseases and various obstetric pathologies can cause intrauterine fetal hypoxia and asphyxia of newborns; in fact, asphyxia in childbirth is often a continuation of intrauterine fetal hypoxia (Badalyan, 2001; Volpe, 2008).

Depending on the severity of the hypoxia, the degree of asphyxia, adequacy of therapy, and other factors, perinatal nervous system damage can have a wide range of outcomes, ranging from favorable and severe. Severe hypoxic-ischemic encephalopathy leads to significant violations of ontogeny and diseases of the nervous system — cerebral palsy, epilepsy, mental retardation, and other severe maladies (Aicardi, 2013; Petrukhin, 2012; Palchik, 2013; Volpe, 2008). These diseases must be analyzed separately. However, in most cases (about 60%) the prognosis for dealing with the consequences of perinatal CNS damage is favorable or relatively favorable: recovery or minimal brain dysfunction (Petrukhin, 2012; Studenikin et al., 2003).

Thus, investigation of the features of mental development of children with mild perinatal brain damages is necessary for the following reasons: Children with favorable outcomes of perinatal CNS injuries are in the majority; these children are the least studied; they are very seldom put under medical observation after 1 year old; they are not officially registered as disabled children and, so, the social environment's demands on them are quite tough; and there is a lack of rehabilitative programs for these children.

However, despite the urgency and practical importance of this problem, it has seldom been investigated. In the medical literature there are descriptions of a number of studies (Naeye & Peters, 1987; Salova, 2009; Calvigioni & Hurd, 2014; El Marroun, White, Verhulst, & Tiemeier, 2014; Hebebrand & Verhulst, 2014; Sayal, Heron, Draper, Alati, Lewis, Fraser,…, & Gray, 2014; Tiesler & Heinrich, 2014), proving the negative impact of intrauterine hypoxia, including of toxic origin, on

the child's mental ontogenesis, even in cases of favorable outcome. Medical research cannot replace the psychological study of the issue. Usually, the medical studies focus on the neurological status of the children, and the psychological part of the research is reduced to one or two standardized tests. Very often in scientific medical research, there is a substitution of psychological terms and concepts. As a rule, medical researchers cannot conduct high-grade psychological and neuropsychological studies, just as psychologists cannot conduct competent medical investigations.

From our point of view, the method of neuropsychological syndrome analysis developed by A.R. Luria (Luria, 1966, 2000, 2002) is the most productive way of investigating the long-term consequences of perinatal CNS damage. Qualitative syndrome analysis, adopted by Russian child neuropsychology (Mikadze, 2008, 2011; Akhutina & Pylaeva, 2008; Glozman, 2009, 2012), contributes to our understanding the mechanisms of this or that form of dysontogenesis, and allows us to determine the functional nature of the defect, as well as to take a new approach to developing corrective methods.

Previously, we used a neuropsychological analysis to study the influence of mild hypoxic PPNS on the mental ontogenesis (Sultanova, & Ivanova, 2009, 2013, 2014; Sultanova, 2015, 2016). But our investigations were dedicated to preschool children, and the significant question is: What will happen to these children in the future? Perhaps some dysfunctions can be compensated for at school age, but could they instead be aggravated, negatively affecting mental ontogeny? Certainly, the older the child, the more difficult it is to see the impact of PPNS as the main factor causing an ontogenesis disorder: a lot of other external and internal factors have acted on the child. But the same factors influence the children without PPNS. The children in this study lived and developed in the same cultural, social and educational environment, which allows us to conduct a comparative study.

Thus, the objective of this study was to conduct neuropsychological analysis of the features of mental development of school-age children with mild hypoxic–ischemic perinatal CNS damage in their anamnesis.

Methods

Our research involved 62 children 10-12.5 years old (pre-teens) studying in comprehensive schools in Moscow; all the children were brought up in socially well-off families; all children wrote with their right hands — that is, there were no apparent left-handed people among them. The main group consisted of 42 neurologically healthy children who had hypoxic-ischemic encephalopathy of mild severity (the 1st degree) in their anamnesis; the Apgar scores (Apgar, 1953) in all these children were not less than 7 points (this information was taken from their medical records). The control (comparison) group consisted of 20 neurologically healthy children without indication of pathology of pregnancy and labor in their anamnesis.

We used the following methods: neuropsychological Luria tests adapted for children (Simernitskaya, 1991; Tsvetkova, 1998; Akhutina & Pylaeva, 2003; Glozman, Potanina, & Soboleva, 2006; Semenovich, 2002; Glozman, 2012); an interview of parents and teachers about the peculiarities of children's behavior; and analysis

of electroencephalogram (EEG) reports. Each child's performance on the neuropsychological tests was evaluated by the standard for this type of diagnostic system: from 0 to 3, with 0 points being the perfect result, 3 points showing the most defect (a child cannot cope with the task, even after a prompt). To determine the reliability of the differences between the groups, we used the non-parametric Mann-Whitney statistical test (U criterion) and also the criterion φ * (the angular Fisher transform).

Results

Despite the apparently favorable outcome of perinatal damage of the nervous system (recovery: the children are officially recognized as healthy and are not observed by neurologists), the mental development of children of the main group had statistically significant differences from that of the control group. First of all, every child with PPNS had neurodynamic disorders. The neurodynamic disorders in the children studied were less pronounced than in the preschool children whom we investigated earlier. But they were observed in all the children of the main group (see Table 1 for numerical values) in the form of 1) a decrease in the ability to work; 2) the need for a prolonged preparation ("warm-up") period; 3) changes in the pace of activity; and 4) inertia. The pace of work for these children, as a rule, could be quite high, but only if the child did not work diligently, and performed tasks carelessly. For most children in the main group, the pace of work was significantly reduced if the child was trying to carry out tasks with high quality and attentiveness.

Table 1. Neurodynamic disorders in the children (number of children, % of all children in the group)

Disorder	The main group, %	The control groupб %	Statistical significance of differences
Decrease in the ability to work	84	25	$p \leq 0.05$
Prolonged preparation ("warm-up") period	72	10	$p \leq 0.01$
Changes in the pace of activity	74.4	15	$p \leq 0.05$
Inertia, including:	79.2	15	$p \leq 0.05$
repetition of the previous finger's position in the tests for kinesthetic praxis	43.2	5	$p \leq 0.05$
difficulties in switching in tasks for dynamic praxis and assimilation of the motor program	79.2	15	$p \leq 0.01$
execution of previous instruction, or «jamming» on the task execution algorithm	69.6	10	$p \leq 0.01$
«viscosity» of emotions	67.2	10	$p \leq 0.05$
total, those or other violations	100	30	$p \leq 0.01$

Inertia manifested itself in the following phenomena. In the motor sphere it showed up in perseverations: for example, repetition of the previous finger position

in the samples for kinesthetic praxis, repetition of the elements of the motor program, and the difficulty of switching in tasks for dynamic praxis, and «extra» letters or their elements in the writing. In the cognitive sphere it showed up as «jamming» on the previous instruction, or on the same way of performing the task.

For example, some children, after completing assignments for naming images, could not compose a story by picture, because they were just starting to identify the depicted objects; the children did this task correctly after the specialist pointed out that the task has changed, and it is necessary to describe what happens in the picture. In the emotional sphere the inertia showed in the "viscosity" of emotions, the continuation of an emotional response to the already completed situation. This was also reflected in parental reports, where parents noted their children's touchiness, or that "the child cannot calm down for a long time" after an event.

Due to fatigability, inertia, sluggishness, or hyperactivity, these children experience difficulties in communicating with other children and on lessons. This has a negative effect on the process of cognitive development, on the children's self-concept and their social adaptation. It can be assumed that these neurodynamic features are directly related to the perinatal CNS damage, since the intrauterine period of development is especially important for the maturation of subcortical structures that support brain activation. The EEG reports of the children of the main group described dysfunctions of the subcortical and/or stem structures of various degrees of severity. This is consistent with the findings of medical research (Sokolova, 2004). Thus, neurodynamic disturbances which are associated with dysfunctions of the subcortical brain structures, can be the primary defect in children as the consequence of PPNS.

Another typical feature of children with PPNS was an insufficiency of voluntary regulation, or self-control. All children of the main group had this trait, but with differing severity (this is discussed below). In the control group, this condition was noted much more rarely (in 15% of children). Goal-setting, programming, and monitoring — that is, functions that are controlled by the prefrontal brain (Luria, 2002; Khomskaya, 2005), the so-called "executive functions" (EF) — were late in developing in children of the main group. This was manifested in the process of neuropsychological research, in school, and at home.

In the process of the neuropsychological research the children were distracted and often acted impulsively; thus, the researcher was forced to repeat the instruction several times or call for careful execution of the assignment. For example, in the study of visual gnosis, children called the crossed-out image of the comb alike "saw", but when the researcher said "Pay close attention!" the children gave the correct answer. If the researcher could not intervene, the children did not cope. For example, in the study of verbal memory, children often reproduced the same word several times. As a result, their reduced self-control caused the deterioration of performance on the gnosis, attention, memory, and speech development tests. Teachers noted that these children are distracted and distract other children during their lessons, do not write down their homework, do not finish tasks, etc.; this reduced the child's progress in school.

According to the parents, these children often do not fulfill requests at home; they are very difficult to get to help with housework. Great difficulties arose around

doing homework. Children could not "sit down for lessons" at home, preferring to play with gadgets or watch TV; they perform tasks carelessly and incompletely. It seems that these children can perform something productive only with the participation of an adult who is nearby; it's as if the adult is "fulfilling" the functions of the prefrontal parts of the brain.

R.A. Barkley (2000) identified such aspects of executive functions as:

- Volition, planning, purposive, goal-directed, or intentional action.
- Inhibition and resistance to distraction.
- Problem-solving and strategy development, selection, and monitoring.
- Flexible shifting of actions to meet task demands.
- Maintenance of persistence toward attaining a goal.
- Self-awareness across time.

Our research does not allow us to say anything about "self-awareness across time", but all the other five aspects of EF were inadequate to some extent in the children of the main group. A deficit of executive functions leads to negative consequences for the child's further development because these functions are "those capacities that enable a person to engage successfully in independent, purposive, self-serving behavior" (Lezak, 1995, p.42).

The insufficiency of executive functions may be associated with a lag of development of frontal lobes and connections between the frontal lobes and subcortical brain structures. Thus, according to the research data, two basic disorders underlie the deviations of mental ontogenesis of the children with PPNS: neurodynamic disorders and insufficiency of executive functions. We called this syndrome the "subcortical-frontal syndrome". Earlier, in the studies mentioned above, we observed similar disorders in preschool children. But in preschool children, neurodynamic disorders have come to the fore, while in school-age children, the deficit of executive functions is more pronounced.

In addition to the disorders described above, each child in the main group had a failure of at least one neuropsychological factor. That is, in general, a "mosaic picture" was observed, in which relatively preserved neuropsychological factors were combined with the insufficiency of others. Insufficiency of the following factors was noted most often: voluntary attention, verbal-auditory memory, kinetic and kinesthetic praxis, visual-spatial gnosis, and phonemic hearing. Auditory and tactile gnosis proved to be the most intact functions in the children of the main group. It should be noted that in tests for the localization of touch, children were not always accurate, but the same was observed in the control group. Statistically significant differences are presented in Table 2.

To our surprise, we found mistakes and synkinesis in the tests for kinesthetic praxis in many children in the main group. These mistakes were often not severe, but did not correspond to child's age. The children consistently changed their fingers in finding the right position; acted awkwardly; helped themselves by their other hand to fold their fingers to the right position; or were wrong and could not always correct the errors, even if the researcher pointed to them. Synkineses were observed only in children of the main group (60% of children); they were more manual-manual than manual-oral.

Table 2. Statistically significant differences between groups in the performance of neuropsychological tests

Insufficient function	average score		significance of differences
	main group	control group	
Voluntary attention	2.1	0.5	$p \leq 0.01$
Motor functions:			
kinesthetic praxis	1.4	0	$p \leq 0.05$
kinetic praxis	2.3	0.6	$p \leq 0.01$
including reciprocal hand coordination	2.2	0.4	$p \leq 0.01$
Visual-spatial gnosis	2.1	0.8	$p \leq 0.01$
Verbal-auditory memory	1.4	0.5	$p \leq 0.05$
Phonemic hearing	1.8	0.6	$p \leq 0.05$

It should be noted that all the children studied were right-handed. But in the group of children with PPNS, "hidden" left-handedness was seen twice as often (see Table 3), and the dominance of the left eye and the left ear was also often observed. Children who had a leading left eye (that is, the dominance of the hand and the eye did not match) had difficulties in mastering writing skills sometimes to the point of dysgraphia. And we cannot ignore the fact that many children of the main group had hypermobility of the joints (possibly due to connective tissue dysplasia), as well as a variety of different obsessive movements.

Table 3. Different forms of left-side dominance in groups (number of children, %).

Form of left-side dominance	Main group	Control group
children with latent left-handedness or children with ambidexterity, who were «retrained» on the right hand: the child writes with his right hand, but in activity often uses his left hand, and Luria's tests show the dominance of the left hand	64%	30%
Domination of the left eye	48%	35%
Domination of the left ear	43.2%	25%

Kinetic praxis was naturally disturbed in children with PPNS in their anamnesis. We have already mentioned inertia, perseverations, and difficulties in retaining the motor program. A simplification of the program and a lack of smoothness of movements often were also observed in these children. In a graphomotor sample ("fence" with alternating elements П/\) children very often introduced an extra "facilitating" element (this was the most common mistake). The task of "fist-palm-edge" (to repeat the successive movements of the hand) was one of the most difficult for these children. Children in the control group also made mistakes in this task, but they were not as serious as those in the main group, and often the children corrected themselves. Children in the main group often just chaotically changed

the poses of the hand, and only direct speech control could help. Children of the main group showed quite low results when performing a task for reciprocal hand coordination. Only 8.8 % of these children did this task correctly; the rest made mistakes, moved their arms, carried out the movements slowly.

The children of both groups performed tasks for visual gnosis quite well. In the main group there were errors related to the impulsiveness of answering, and insufficient attention, but these errors were corrected by the children. Tests for visual-spatial gnosis were difficult for children from both groups, but the children with PPNS consistently performed worse. In particular, a lot of mistakes and refusals to perform the task occurred in the test "clock with arrows". Perhaps this is due to the fact that children these days rarely use such clocks. However, there were many gross mistakes in the Piaget Bottles test (to draw the water level in a rotating bottle), although children today often deal with different drinks in bottles. Insufficient development of the spatial factor was manifested in other tests: kinesthetic praxis, spatial praxis, copying of figures. This insufficiency can be associated with a delay in the development of the occipital-parietal areas of the right hemisphere.

In the study of audio-verbal memory, significant results were obtained only in the test of memorizing ten words. The performance of the children in the main group demonstrated the following features: 1) a decrease in the results on the first attempt to recollect, which may be due to inertia, and a long indicative period; 2) a large number (up to 50%) of errors, most of which were semantic substitutions (similar in meaning to the word) or substitutions by associative principle (for example, after the correct word "brother", the child spoke the wrong word "sister"); 3) frequent repetition of the same words when recollected; these errors are associated with a decrease in self-control; and 4) with delayed reproduction, children recollected fewer words (6.3 on average) than children of the control group (7.8 on average). Thus, the majority of children with PPNS had a tendency to decline in audio-verbal memory under the influence of two mechanisms: first, the weakness of trace formation, which may be associated with functional deficiency of the left temple area; and secondly, the reduction in the factor of voluntary control, which is provided by the prefrontal parts of the brain.

In children with PPNS in their anamnesis, certain distinctive features of speech development were also observed. These children made mistakes in naming objects, had difficulty formulating a compound sentence, and more often had dysarthria, dysgraphia and dyslexia, than those in the control group. But statistically significant differences were obtained only on phonemic hearing. The children of the main group made serious mistakes (the children in the control group sometimes confused the sounds "o" with "u"). Their insufficiency of phonemic hearing often led to misunderstanding the meaning of the word they heard and to mistakes in writing (dysgraphia).

Thus, according to our results of the study, left-hemispheric functions and interhemispheric interaction suffer to a greater degree in children with the consequences of PPNS. In general, it turned out that the development of the functions of the left hemisphere is more vulnerable to perinatal hypoxia than the development of right hemispheric functions.

We said above that the severity of violations of executive functions differed among the children of the main group. We divided *the main group* into two sub-

groups, depending on the degree of these disorders. Children of subgroup 1 (16 persons, 38% of the main group, most of them girls) had pronounced neurodynamic disorders and little insufficiency of executive functions. Children of subgroup 2 (26 persons, 62% from the main group, most of them boys) also had neurodynamic disorders, but the inadequacy of voluntary regulation of activity came to the fore.

Most children in the subgroup 1 had good school performance and social adaptation (see Table 4), but their quality of life was reduced. It took them a long time to do their homework, and they got "stuck" on negative experiences; they often had psychosomatic and neurotic reactions, increased anxiety, and decreased self-esteem. Deviant behavior was not observed in these children very often; deviant behavior manifested itself in the form of negativism, addictions (Internet addiction, game dependence, and overeating, etc.), absenteeism, and sometimes suicidal thoughts.

Table 4. Some characteristics of the selected subgroups

Subgroup	Gender composition	School performance, average score (max. 5)	Correct execution of tasks on verbal-logical thinking	Deviant behavior
Subgroup 1: mild insufficiency of executive functions	about 75% of girls, and 25% of boys	4.1	70% of children	37.5% of children
Subgroup 2: pronounced insufficiency of executive functions	about 23% of girls, and 77% of boys	3.3	38.5% of children	84.7% of children

In children of subgroup 2, the inadequacy of voluntary regulation becomes the main factor hampering productive activity and social adaptation. Children from subgroup 2 did worse in school, and they often broke the rules of the community. Indicators of verbal-logical intelligence were somewhat reduced in these children. These children had a lower school performance, and often deviant behavior was observed (verbal and physical aggression towards parents, teachers and peers, lying, absenteeism, theft, early tobacco smoking, and different addictions, etc.). These children are characterized by a lag in the formation of the ability to control emotional manifestations. Often they had a combination of aggressiveness towards their peers with negativism towards adults, especially when the adults were trying to regulate a child's activities. Also, the "sense of distance" in these children was violated. As a rule, they had a combination of increased emotional susceptibility and vulnerability about themselves, with a relatively low sensitivity to others, an insufficiency of empathy. These children had worse relationships with their peers and teachers, and their social adaptation was often disrupted. We can say that children from the subgroup 1 suffer from their condition while the children from subgroup 2 make the people around them suffer.

In our opinion, the features of children with PPNS we've described are due to two groups of factors:

1. Functional insufficiency of various structures of the brain, which can be both primary (deficiency of subcortical structures) and secondary (mainly the impaired development of the left hemisphere).
2. Social factors. In most cases, the presence of the mild PPNS in a child is not sufficiently taken into account in the upbringing and education of the child. Parents, educators, and teachers make demands on the child as if he or she were a healthy child, demands which do not correspond to his capabilities. As a result, secondary disturbances of the emotional-personal sphere arise in the child, and often a quite pathological adaptation to the surrounding social environment appears.

Conclusion

Thus, the mental development of school-age children with a mild perinatal pathology of the nervous system in their anamnesis differs from the development of their peers. We can talk about the long-term consequences of the mild hypoxic perinatal damage of the nervous system. It is necessary to continue the study, although every year it is increasingly difficult to find children for the control group.

We investigated the effect of *mild* PPNS on ontogeny. However, we have seen cases when severe perinatal lesions of the nervous system did not lead to gross violations of the child's development. Analyzing such cases in a separate work would be necessary and interesting. Also, the impact of family upbringing, child-parent relations, and other social factors on the development of children with PPNS in their anamnesis would be interesting to investigate.

Limitations

The limitations of our research are primarily related to the small sample of children studied. In addition, all the children studied lived in urban conditions. Perhaps children living in rural areas would show slightly different results. Children with social deprivation, for example, who are not brought up in the family, but in orphanages, are also not investigated.

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