

## FUNCTIONAL BRAIN ASYMMETRY AND THE PROPER NAME

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### ABSTRACT

There are several published works on the influence of long-term weak acoustic stimuli onto living organisms and their development. In this context, functional brain asymmetry (FBA) parameters were studied in correlation with the proper name. A. R. Luria sensorimotor tests (the dominant thumb when “locking” hands, the dominant eye, the dominant hand when crossing hands (the Napoleon’s pose), the dominant palm when applauding, the dominant ear) were used. With the data collected, we calculated relative difference in the numbers of the “right” and “left” in the group of certain name bearers for each test, %: thumb – (R-L)t, eye – (R-L)e, hand – (R-L)h, palm – (R-L)p, ear – (R-L)e, total for all tests –  $\Sigma(R-L)$ , %. 1,136 men and 2,140 women born in 1920–1991 were examined. With the Fisher’s criterion, significant differences were detected in the bearers of various names,  $p \leq 0.05 \div 0.001$ , as well as the differences by 1–2 FBA parameters in the namesake persons belonging to different generations (born in 1971–1991 – “young” and born in 1920–1970 – “old”),  $p \leq 0,05 \div 0,001$ . The conclusion was that among the known functions of the proper name there is also an adaptive function.

**Key words:** *adjustment, long-term weak acoustic stimuli, proper name, functional brain asymmetry.*

### INTRODUCTION

Sounds make an essential part of the environment an individual lives in. They are divided in biogenous and abiogenous, natural sounds. Acoustic communication is used by most living organisms. The sounds of biological origin,

including the sounds made by animals themselves – communicative signals, navigation sounds, etc. – are most important for all the animals with the auditory system. Notably, the sounds made by animals themselves can be incomparably weaker than the sounds of the environment.

For humans, the sounds of the proper name they have been hearing from early childhood have great significance. Names can be compared with inherited generic types in genetics, with constitutions and archetypes. Names are focuses of social energy [19]. The name is identified with corporal and spiritual individuality. As a part of self-consciousness, the name determines personal values and trends in the claim of recognition, gender identification, life priorities and prospects, the rights and duties system [14].

Cerebral functions are characterized with the highest individual variability under the influence from the environment, education and practice [1]. There is a weak response to acoustic stimuli in the auditory cortex and a simultaneous reaction in another area of the cerebral cortex, and the additional reaction intensifies as the volume of sound increases [6].

The cells of various human organs are sensitive to the acoustic vibrations of similar frequencies, especially of the frequencies to which the human ear is mostly adjusted. The latest data proves cumulative effect of low intensity sounds at long-term or repeated exposure [2, 7, 17, 18], the sounds influencing embryogenesis in animate beings [9], facilitated with the phenomenon of multi-frequency parallel resonant capture [11].

In the light of the aforementioned, our work was aimed at a thorough research of the name as a complex acoustic signal and a vibration stimulus affecting individual. The study of many years resulted in the monograph *Sounds, Words, Names* [3].

The study results showed that there is an uneven ratio of names belonging to prominent representatives of certain occupations, especially when related to the names' popularity. There is a correlation between the name and the occupational trend, the success in a certain professional field,  $p \leq 0.05 \div 0.001$ .

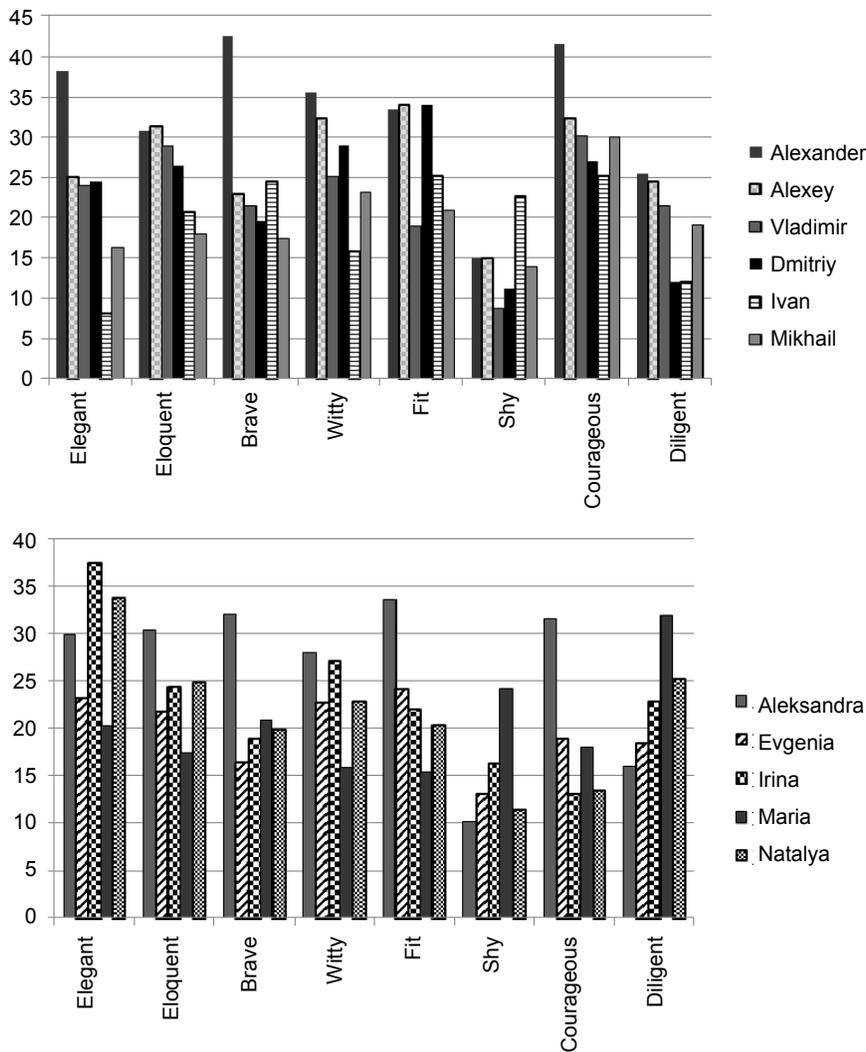
The multicomponent image of the name – color, emotional, characterologic – was revealed. The characterologic image was studied with the 100-scale method by M. Goklen [7], in two stages. Responding biology and psychology students were asked to tick in the test forms those personality traits which, in their opinion, are common in the bearers of 20 men and 20 women names. The respondents filled out one test form including the first 50 or the last 50 scales for 10 men or women names in one day. Then a percentage index was calculated for each scale, regarding the sum of all the ticks for a certain name. Signi-

ficant and reliable differences in the characterologic images of the studied names were detected for every scale at  $p \leq 0.05 \div 0.001$ . Picture 1 illustrates it for 6 men and 5 women names and 8 scales of the Goklen's method.

There is a psychological phenomenon of the first impression self-proving effect [16]. It can be assumed that the existing multicomponent image of the name influences first impressions and determines both primary expectations regarding a new person and the new person's responses. Consequently, the image of the name helps intuitively set a correct behavior pattern from the first minutes after meeting a new person.

The complex study of the representative groups of namesake persons revealed profound differences between the bearers of different names. For each name, there is a unique set of the following indices of individuality: functional brain asymmetry, the circadian chronotype, the adjustment to sleep-wake cycle, masculinity-femininity, the thinking style, temperament, personality traits, self-esteem, motivation, etc. These differences are significant and reliable,  $p \leq 0.05 \div 0.001$  [5].

The results of the research on functional brain asymmetry – the lateral profile – are of high importance. Functional brain asymmetry (FBA) characteristics provide the base for a unique personality. To a large degree, they determine one's perception and sense of time, academic achievements, professional and personal characteristics, trends for longevity. They are reflected in the anxiety level, stress resistance, susceptibility to mental and somatic illnesses. The individual and population ability of adjusting to given conditions of natural and social environment also depends on FBA parameters. There is a correlation between the FBA parameters and some indices of natural environment at early embryogenesis and ontogenesis [3].



**Picture 1.** Examples of brief characterologic images for 6 men and 5 women Russian names by the Goklen’s method, the number of respondents varying from 180 to 220 persons.

## MATERIAL AND METHODS

We studied BFA with Luria sensorimotor tests: the dominant thumb when “locking” hands, the dominant eye, the dominant hand when crossing hands (the Napoleon’s pose), the dominant palm applauding, the dominant ear. With the data collected, we calculated relative difference in the numbers of the “right” and the “left” in the group of certain name bearers for each test, %: thumb –

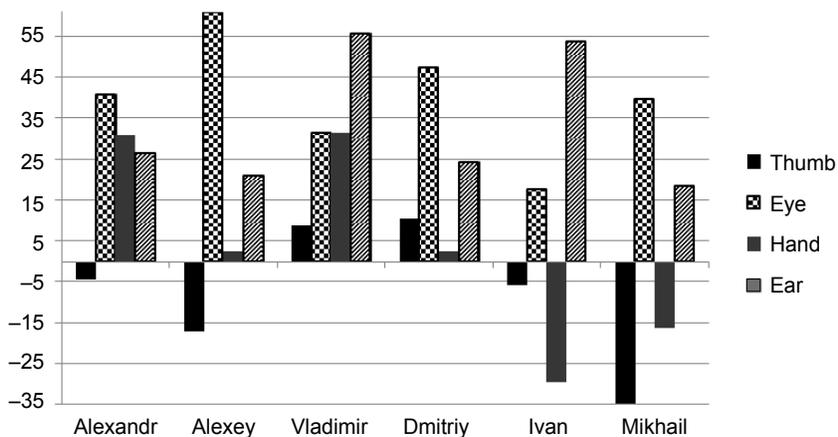
(R-L)t, eye – (R-L)e, hand – (R-L)h, palm – (R-L)p, ear – (R-L)e, total for all tests –  $\Sigma(R-L)$ , %.

Data on bearers of tens names (2,140 women and 1,136 men born in 1920–1991) was collected. Significant and reliable differences of the studied indices in relation to names were detected with the Fisher criterion,  $p \leq 0.05 \div 0.001$ .

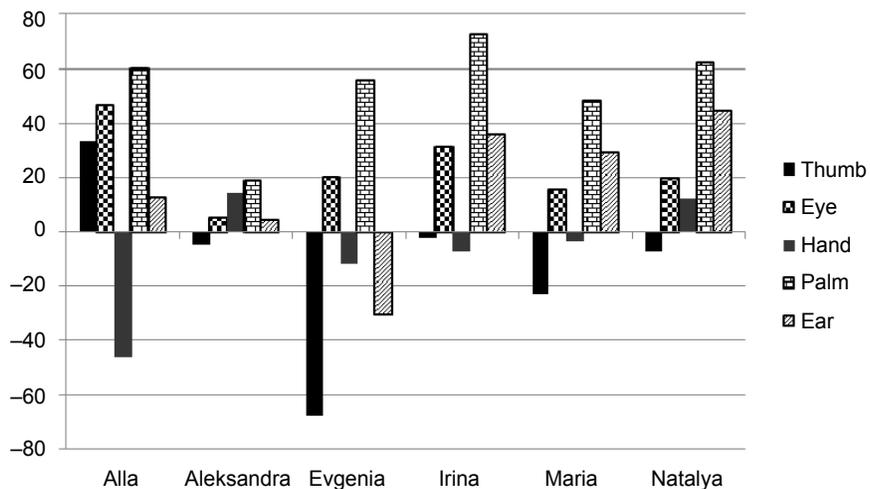
## RESULTS

The bearers of a certain name can be characterized with a definite combination of lateral profile averaged values. It is most obviously manifested if the FBA values in persons with common and rare names are compared. Gender differences in the FBA were revealed, as well as certain variations in the namesake persons belonging to different generations. Pictures 2 and 3 present examples of lateral profiles for the bearers of some men and women names born in 1971–1990.

It must be mentioned that some of the studied psychophysiological values, including the FBA index, can vary in the namesake persons belonging to different generations due to the conditions of social and natural environment influencing personal development. The comparative analysis of the FBA values in the namesake persons born in 1920–1970 (“old”) and in 1971–1991 (“young”) witnesses the similarity of their lateral profiles. Significant variations, if there are any, normally include one index in women and up to three indices in men. The changes for the bearers of different names can be oppositely directed – towards the right asymmetry increase as well as towards left asymmetry (see Table 1). For example, significant and reliable variations of the dominant thumb sensorimotor test (R-L)t were detected in the bearers of the names Ekaterina and Olga. Left asymmetry prevailed in the persons of the “young” generation bearing the name Ekaterina compared to the persons of the “old” generation, and in the bearers of the name Olga it was right asymmetry, (R-L)t,  $p \leq 0.001$ ; 0,05. Similar changes of dominant palm sensorimotor test values were detected in the persons bearing names Andrey and Evgeny: the values of the index (R-L)p shifted towards right asymmetry in the “young” generation of Andreys compared to the “old” generation and towards left asymmetry in bearers of the name Evgeny,  $p \leq 0.005$ .



**Picture 2.** Features of lateral profile in relation to names. Vertical are the values of sensorimotor tests: dominant thumb, eye, hand, palm, ear, (R-L)%. Numbers of men names bearers were: Alexandr – 110, Alexey – 82, Vladimir – 35, Dmitriy – 76, Ivan – 17, Mikhail – 43 persons.



**Picture 3.** Features of lateral profile in relation to names. Vertical are the values of sensorimotor tests: dominant thumb, eye, hand, palm, ear, (R-L)%. Numbers of women names bearers were: Alla – 15, Aleksandra – 42, Evgenia – 25, Irina – 97, Maria – 83, Natalya – 138 persons.

**Table 1.** FBA values in namesake women from different generations

Generation	N	Name	Finger	Eye	Hand	Palm	$\Sigma(R-L)$
Old	9	<b>Ekaterina</b>	77.8	33.3	11.1	77.8	48.7
Young	95		-11.6	24.2	1.0	49.5	18.0
		<i>Up</i>	2.89**	---	---	---	1.95*
Old	34	<b>Elena</b>	5.9	23.5	0.0	70.6	25.0
Young	136		-8.8	33.8	2.9	50.0	18.7
		<i>Up</i>	---	---	---	1.36	---
Old	38	<b>Irina</b>	0.0	21.0	-15.8	78.9	19.7
Young	97		-5.1	38.1	-3.1	73.2	26.1
		<i>Up</i>	---	---	---	---	---
Old	25	<b>Natalya</b>	16.7	-8.3	8.3	58.3	18.4
Young	138		-10.8	26.6	9.3	64.0	25.9
		<i>Up</i>	---	-1.62	---	---	---
Old	32	<b>Olga</b>	-54.8	16.1	-22.6	74.2	3.1
Young	142		-11.3	28.2	-8.4	52.1	15.6
		<i>Up</i>	2.39**	---	---	1.47	-1.31
Old	33	<b>Svetlana</b>	-15.1	21.2	21.2	63.6	19.1
Young	109		-27.9	15.3	-6.3	53.1	10.8
		<i>Up</i>	---	---	1.39	---	---
Old	28	<b>Tatyana</b>	7.1	21.4	-7.1	57.1	19.0
Young	73		-26.0	37.0	6.8	37.0	15.7
		<i>Up</i>	1.51	---	---	---	---

Note: N – number of persons studied. *Up* – Fisher criterion of significant difference. Table keys: --- – *Up* values no significant; 1.47+1.62 –  $p \leq 0.1$ ; \* –  $p \leq 0.05$ ; \*\* –  $p \leq 0.01$ ; \*\*\* –  $p \leq 0.001$ .

## DISCUSSION

Speech and language are permanently changing and developing. It is also true for proper names, their forms and tendencies in naming. Up to 10–25% of components of the name image change over one, ten and more years, which complies to the phenomenon of the shifting value – changes in word semantics [5, 10, 12, 13, 15].

Varieties in musical language, speech frequency values and the vocal vowel A are **synergetic** to seasonal and long-term variations and geocosmic fluc-

tuations [4]. Together with the facts of changing name forms, tendencies in naming and the evolution of the language, the name image and the characteristics of namesake persons from different generations, it allows assuming the name adaptive function regarding the changing environment.

Obviously, naming trends are to a certain degree determined with unconscious needs of society as a complex self-organizing system for specific acoustic “exposure” in relation to the present and future and in connection with dominant sounds of natural environment. Of all names, people choose, primarily, those which bearers will be able to adjust most successfully to upcoming natural and social conditions and to help the society with their activities.

Therefore, the name as a longstanding weak acoustic and vibration stimulus affects brain functions and, apparently, brain architectonics and shapes the development of personality.

The name on its own creates neither good nor bad personality. It is only a shape, while it is up to a person to choose one’s path [19]. It is unquestioned that personality is defined mainly by genetics, parenting, social and natural conditions. However the name and naming contribute to the individual development of the person.

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