Near the origin of informational measurements in the humanities
(Dedicated to the 70th anniversary of Sergey Maslov)

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Abstract

Eminent Russian mathematician and specialist in cultural studies Sergey Maslov derived a method of quantitative estimation for social and cultural processes. Proceeding from the information theory, he investigated the ‘degree of asymmetry’ of mental processes (left- or right-hemispheric dominance). Appropriate measurements showed strictly periodical behavior of this asymmetry both in socio-political ‘climate’ and style of art.

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Section 08 “Measurement and Metrology for the Humanitarian Fields” is dedicated to the memory of Sergey Yu. MASLOV (1939-1982) whose impact into the quantification of humanitarian knowledge seems to be great. In the space of scientific life, he worked on the borderline between science and the humanities, being eminent researcher both in applied mathematics and cultural studies. Meanwhile, in the mental (socio-psychological) time, his activity fell both on the “analytic wave” of the 1960’s and “synthetic wave” of the 1970’s, including dramatic (but fruitful) transition between these two too different styles of thinking. So, both Maslov’s personality and his activity may serve an illustration to his main theoretical concept which dealt with the information theory applied to humanitarian studies.

The heart of the matter is in that Sergey Maslov investigated the contraposition of two principal stylistic paradigms of the information processing which are inherent in any advanced system, e.g., the man or the society. These ‘contrastive poles’ are the following [1]:

– ‘analytic’ style of thinking, consisting in consecutive processing small portions of the information, using a certain fixed rules which are functioning at each given level of the hierarchy of informational activity;
– ‘synthetic’ style of thinking, with parallel processing large portions of the information, resulting in a change of a set of paradigmatic rules when transmitting the signals higher, to the next level of informational activity.

Being applied to systems involving human beings, this contraposition has a form of opposition of left- and right-hemispheric dominance, respectively.

Each system in each moment of its functioning, can be characterized by a certain degree of prevalence either of analytic (i.e., left-hemispheric) or synthetic (i.e., right-hemispheric) style. Maslov derived a procedure to measure this degree, basing on expert estimations of each time unit (as a rule, he used 5-year units) over several parameters which are specific for the field of the activity studied. Thus, for such a field as the socio-political ‘climate’ of the society, he resorted to the help of the following parameters:

a) Active character of foreign policy – Passive character of foreign policy;
b) Openness of the society – Closed character of the society;
c) Increasing exports and/or imports;
d) Democratic character of social relations (e.g., ‘social contract’) – Authoritarian character of social relations;
e) High prestige of knowledge – Low prestige of knowledge.
In order to estimate the value of each parameter for each time unit, various partial indicators were used. For instance, to judge about the ‘prestige of knowledge’ (parameter $e$), such partial indicator was taken into account, as increasing or decreasing the number of pupils, students, etc.

Each parameter is presented in the form of a binary opposition, its left pole responding to analytic (left-hemispheric) prevalence, right pole being associated with synthetic (right-hemispheric) prevalence. On the basis of these parameters, the so-called ‘index of asymmetry’ was determined for each time unit, this index being capable of changing in the range from $-1$ (‘purely’ synthetic, or right-hemispheric style of thinking) to $+1$ (‘purely’ analytic, or left-hemispheric style). Analogous set of stylistic parameters was derived by Maslov for such a field as the architecture.

The main discovery of Maslov dealt with measuring strict periodical behavior of the above index, with full duration of cycles about 48-50 years. This value responds to the length of the dominance of each generation in the entire socio-psychological life of the society. Really, the prevalence of each generation usually lasts about 25 years – because, in accordance with Max Planck’s remark, the generation never ceases to dominate before the death of its members. (In turn, the lifetime of the generation is determined mainly by the reproductive cycle of human beings, which is more or less constant.) The reasons of the ‘need to switch’ to another style of thinking are rooted in the exhaustion of the potentialities of each given paradigm after definite time of its dominance.

Maslov retraced exactly these periodical processes – stylistic waves in such fields as the socio-political ‘climate’ and architecture of many countries and epochs. (Though in his classical work [1] he published only two wave-like evolutionary curves, relating to Russia of the 18th – 20th centuries.) Fragments of evolutionary curves built on the basis of Maslov’s data, are shown on Fig. 1. Here the above mentioned ‘index of asymmetry’ is presented vs time ($t$); upper curve responding to the style of the socio-political ‘climate,’ lower curve to the style of architecture. [Positive values of the index designate ‘left-hemispheric’ dominance, negative values – ‘right-hemispheric’ prevalence.]

![Fig. 1. Fragments of evolutionary trajectories: ‘index of asymmetry’ vs time ($t$), for the socio-political ‘climate’ of Russia (upper curve) and Russian architecture (lower curve).](image)

During last two decades, numerous analogous investigations (besides, using more advanced measurement procedures described in some papers of this Section) were fulfilled for various fields of activity (e.g., music, painting, poetry, theatre and so on) which took place in
many other countries. In the overwhelming majority of cases, exactly such 50-year periodical stylistic changes were really observed – see, e.g., [2, 3]. But what is the most remarkable in these data is the synchronism of the periodical processes in different fields, e.g., in music and painting, architecture, etc. Thus, Fig. 1 shows synchronous stylistic changes in the socio-political ‘climate’ of Russia and Russian architecture; quite similar synchronism was observed in other cases which evidences of holistic features of the entire socio-psychological life. Moreover, this synchronism embraces not only various spheres of activity, but also different regions of the world – those regions which are in informational contacts with each other. [For instance, the waves of left- or right-hemispheric style took place simultaneously in Russia and West-European countries – but only after 1730’s, when due international (informational) contacts were established.]

Considering the character of personal creative activity, we should take into account that exactly those time segments of the evolution are of most interest, which respond to transitions from one type of domination to another, contrastive type: the atmosphere of innovations stimulates individual creative achievements! The creativity of Sergey Maslov confirms this thesis: his youth fell on the epoch of 1960’s, when new left-hemispheric wave came in order to replace old right-hemispheric ‘climate.’ This epoch was one of the most productive in the history both of social and creative life, especially in Russia [3, 4].

Besides, Maslov was a typical representative of Russian intelligentsia of the second half of the 20th century (in particular Petersburg branch of intellectuals, with their specific peculiarities), possessing the inclination to envelop the Universe (and to measure it), to unite rational and emotional constituents of our individual and social life and activity. All these features favored the development of his mathematical models, especially those ones which dealt with human behavior, social relations, culture, and art. His achievements became one of the cornerstones of the contemporary information approach to the humanities.

References