

# Individual Chronotope Of The Neurotic, Stress, And Somatoform Disorders

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## ABSTRACT:

The cause of the disease, that is, functional disorders of the organs and systems of the body, which lead to the disruption of the body as a whole, can not be understood without knowing the psychological characteristics of the patient's personality, and without this it is difficult to predict the course of a specific disease. The root cause that gives rise to various diseases is most often manifested in human psychology. The purpose of the study is to predict the course of neurotic, stress-related and somatoform disorders, taking into account the individual chronotype of

the individual suffering from these disorders. The method of chronometric testing with the purpose of determining the subjective time unit of a patient (using an electronic chronoscope); methods of mathematical statistics: descriptive statistics, methods of averages, percentile statistics, comparison of mean values using the Student's t-test. The results of the experimental study suggest that for the majority of surveyed patients with the non-infectious diseases it is common that the clinical manifestations of the disease not only coincide with the ends of the long cycle quarters and with the end of the cycle itself, but also begin to repeat with a periodicity of  $\frac{1}{4}C$ ,  $\frac{1}{2}C$ ,  $\frac{1}{16}C$ ,  $\frac{3}{4}C$  depending on a typological group affiliation. The results of our study show that in different individuals their dominant disease manifests with a certain "C-periodicity". Analysis of the age of patients from the date of birth to the onset of the disease shows that the place of least resistance is most affected at the end of a long large biological cycle or their long quarters.

**Keywords:** large biological cycle, disorder C-metrics, psychosomatic disease, subjective time unit, lowest resistance point.

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## INTRODUCTION

Psychological differentiation of individual psychological properties of a person shows that the signs of somatic disorders are completely consistent with them and, accordingly, can be sufficiently predicted and determined taking into account typological groups, as well as dependent on individual (own) biological time (Savenkova et al., 2018b; Tsukanov, 2000; Elkin 1945).

The application in the practical activity of knowledge about the system of interdependencies and their relationship between individual-typological features, temporal characteristics, time factor, unit of time in subjects suffering from psychosomatic diseases are of fundamental importance during the purposeful psychological-somatic impact, in the development of timely prediction of disorder (Savenkova et al., 2019e; B.Y. Tsukanov, 2000; Desai & Chaturvedi, 2016).

According to the analysis of scientific literature on the problem of research, the study of the interconnection and interdependence of somatic disorders (on the example of psychosomatic diseases, taking into account the individual-typological characteristics of the individual) on temporal parameters, as well as their correlation, remained out of the scientists' attention (Savenkova et al., 2019c; Elkelboom et al., 2016).

At the same time, the issues of predicting the course of psychosomatic diseases of each individual nosological form of the disease in the typological group of the continuous spectrum of "τ-types" (time types according to B.Y. Tsukanov (2000)) and the degree of expressiveness of psychological and clinical manifestations of the disease in humans remain open in the delineated problem field. suffering from chronic disorders (Savenkova et al., 2019d).

According to the scientific literature (Savenkova et al., 2019a), the type of subjective perception of time or temporal orientation is one of the objective indicators of the dynamic properties of the individual's psyche, reflecting the consistent process of changes that occur with a person during his life. Therefore,

changes occurring in the body of the individual, both mental and somatic, are closely related to the temporal aspect.

J.E. Birren (2014) stressed that the life of an individual from birth to death can be divided into a number of periods. Highlights of multi-day, multi-monthly and multi-year cycles (Andrushchenko, Goncharov & Dosenko, 2018). The scientist singled out turning points in human life, that is, a certain age, at which "psychological fractures" occur and called them nodal points (Savenkova et al., 2018a). Thus, discrete counting of individual time leads to the fact that at the level of subjective experiences and behavioral manifestations of a person's life is uneven, that is, during the life of clearly distinguished periods in which the person is in optimal psychosomatic form, and at the beginning and end - at a minimum. Such periods are known as the great biological cycle. Its duration for the average subject is 7.65 years (Tsukanov, 2000). The inter-individual oscillation range according to the  $\tau$ -types ranges from 6.5 to 9.5 years. Today, we say with confidence that the scale of large biological cycles is the age-old development of the psyche, fluctuations in activity, exacerbation of chronic noncommunicable diseases, as well as psychosomatic personality crises (Savenkova et al., 2019b).

The absence in the scientific literature of interpretations of such concepts as "psychosomatic time factor", "psychosomatic C-metric" of diseases related to the chronological and psychological prognosis of the course of psychosomatic diseases required their clarification.

#### **MATERIALS AND METHODS**

Participants: 960 patients. Among them Organization of research. A questionnaire was filled out for each patient determining the following:

- 1) the age of the person (indicating the quantity of years and months at the moment of the survey);
- 2) number, month, year of birth;
- 3) the type of psychosomatic disorder.

On the basis of the obtained chronometry results, a table was constructed with the definition of the individual's time  $\tau$ -subjective. For each patient who was examined with the help of a chronometric probe method (Tsukanov, 2000), the " $\tau$ -type" was identified, using the classic method of reproducing time intervals to = 2, 3, 4, 5 s, set by the researcher and reproduced by the subjects using an electronic chronoscope to accuracy within 0.001s.

After the sound signal, each examinee was asked to reproduce the duration he experienced. The duration was limited to two signals – "start" and "finish" in the form of sound that occurs when triggering and stopping the chronoscope. The subjects were asked to reproduce the intervals that were set up on this chronoscope.

**Statistical analysis.** The individual value of the " $\tau$ -type" was calculated according to the formula for each proposed interval:

$$\sum t_s$$

$$X_T = \frac{\sum t_s}{n}$$

$\Sigma t_0$

where  $t_0$  is the duration given by the experimenter, and  $t_s$  is the duration reproduced by the examinee.

The reproduction of each time interval was repeated five times, and then the average value of the actual unit of time of each subject was counted. This relation was first proposed by H. Erenwald (2014) to characterize the individual results of the reproduction method. But if H. Erenwald (2014), and then other authors, used this relation as an immeasurable coefficient, B.Y. Tsukanov (2000) attributes it the semantic meaning of the individual subjective time unit. The actual given interval  $t_0$  is the duration experienced in one section of the “subjective time arrow,” and the  $t_s$  duration is reproduced in its second section, in relation to which  $t_0$  is already in the past. Ergo, B.Y. Tsukanov (2000) comes to the conclusion that the given interval in the situation of intense waiting breaks down to a certain number of the  $t_0$  individual’s subjective units, and the restored  $t_s$  duration consists of this number (Ehrenwald, 2014). This method of reproducing the duration to determine the “ $\tau$ -type” allows us to solve the problem of the psychosomatic diseases course chronopsychological prediction.

By the law of experiencing time by subject (Tsukanov, 2000), the large biological cycle of the individual is determined by the formula:  $C = 8.5\tau$  (years) where  $\tau$  is the subjective time unit of the individual. This unit acts as a “step”, which measures the lifetime of each individual from the moment of birth.

**RESULTS**

Estimated and statistical summer years of patients with hysterical neurosis were summarized in Table 1.

Here are individual data from some patients from a group of patients suffering from hysterical neurosis.

**Table 1.** Estimated and statistical age of onset hysterical neurosis

Group	"T-type" (in sec)	C	Cycles (in years)			Statistical age of patients	$\sigma$
Men (12 individual)	$0,7 \leq \tau < 0,72$	6,0	6C	7C	8C	36-42-48	1,3
			36	42	48		
Women (18individual )	$0,7 < \tau \leq 0,72$	6,1	$6\frac{1}{4}C$	$7\frac{1}{2}C$	$9\frac{1}{2}C$	38-45-58	1,1
			38,1	45,8	58		
Men (16 individual)	$0,72 < \tau \leq 0,74$	6,3	$6\frac{1}{2}C$	$7\frac{1}{2}C$	$8\frac{1}{2}C$	41-47-53	1,2
			41	47,3	53,6		
Women (15 individual)	$0,72 \leq \tau < 0,74$	6,2	$6\frac{3}{4}C$	7C	$7\frac{1}{4}C$	41-43-45	1,1
			41,9	43,4	45		
Men (14 individual)	$0,74 < \tau \leq 0,75$	6,4	$7\frac{3}{4}C$	8C	$8\frac{1}{4}C$	49-51-52	1,6
			49,6	51,2	52,8		
Women	$0,74 < \tau < 0,75$	6,3	7C	$7\frac{1}{2}C$	8C	44-47-50	1,3

(13 individual)			44,1	47,3	50,4		
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Patient D. ( $\tau = 0.72c$  C = 6.1 p.).

Inpatient treatment in the treatment department with a diagnosis of hysterical neurosis at the age of 58 years.

Estimated age:  $9\frac{1}{2}$  C.

The first exacerbation of the disease was at the age of 38 years 1 month 6 days.

Estimated age:  $6\frac{1}{4}$  C.

The second exacerbation is at the age of 45 years 9 months 18 days.

Estimated age:  $7\frac{1}{2}$  C.

Frequency of the disease: C.

Estimated and statistical summer years of the patients who had patients with neurosis of the obsessive states and neurasthenia, summarized in tables 2; 3, which show that in different individuals their dominant disease manifests itself with a certain "C-periodicity".

**Table 2.** Estimated and statistical age of onset neurosis of obsessive conditions

Group	"T-type" (in sec)	C	Cycles (in years)			Statistical age of patients	$\sigma$
Men (11 individual)	$0,91 \leq \tau < 0,93$	7,8	4C	$4\frac{3}{4}C$	$5\frac{1}{2}C$	31-37-42	1,4
			31,2	37,1	42,9		
Women (12 individual)	$0,92 \leq \tau < 0,93$	7,7	$4\frac{1}{4}C$	$5\frac{1}{4}C$	$6\frac{1}{2}C$	32-40-50	1,2
			32,7	40,4	50,1		
Men (19 individual)	$0,94 < \tau \leq 0,96$	8,2	$5\frac{1}{2}C$	6C	$6\frac{1}{2}C$	45-49-53	1,2
			45,1	49,2	53,3		
Women (10 individual)	$0,94 \leq \tau < 0,96$	8,1	5C	6C	7C	40-48-56	1,1
			40,5	48,6	56,7		
Men (13 individual)	$0,97 < \tau \leq 0,99$	8,4	$3\frac{3}{4}C$	$4\frac{1}{4}C$	$4\frac{3}{4}C$	31-35-39	1,6
			31,5	35,7	39,9		
Women (15 individual)	$0,97 < \tau < 0,99$	8,3	4C	$4\frac{1}{2}C$	5C	33-37-41	1,3
			33,2	37,4	41,5		

**Table 3.** Estimated and statistical age of onset neurasthenia

Group	"T-type" (in sec)	C	Cycles (in years)			Statistical age of patients	$\sigma$
Men (12 individual)	$1,0 \leq \tau \leq 1,03$	8,7	4C	$4\frac{3}{4}C$	$5\frac{1}{2}C$	34-41-47	1,3
			34,8	41,3	47,9		
Women (11 individual)	$1,0 < \tau \leq 1,03$	8,6	$4\frac{1}{4}C$	$5\frac{1}{4}C$	$6\frac{1}{4}C$	36-45-56	1,1
			36,6	45,2	56		
Men (10 individual)	$1,04 \leq \tau \leq 1,07$	8,8	$5\frac{1}{2}C$	6C	$6\frac{1}{2}C$	48-52-57	1,4
			48,4	52,8	57,2		
Women (13 individual)	$1,04 < \tau \leq 1,07$	9,0	5C	6C	7C	45-54-63	1,2
			45	54	63		
Men (12 individual)	$1,07 \leq \tau \leq 1,1$	9,2	$3\frac{3}{4}C$	$4\frac{1}{4}C$	$4\frac{3}{4}C$	34-39-43	1,6
			34,5	39,1	43,7		
Women (11 individual)	$1,07 < \tau \leq 1,1$	9,3	4C	$4\frac{1}{2}C$	5C	37-41-46	1,3
			37,2	41,9	46,5		

## DISCUSSION

We addressed this problem with regard to the duration of the biological cycle of the individual's life (Savenkova et al., 2020). Namely, the ratio of the life cycle of the individual's life cycle and the period of exacerbation of psychosomatic disease (Didukh et al., 2020).

A.V. Kerbikov (2013) also pointed to a sufficiently clear age-old recurrence in borderline neuro-psychiatric disorders. B.Y. Tsukanov's (2000) studies also revealed a pronounced periodic manifestation of cardiovascular disorders. Repeated exacerbation of the disease is observed in other psychosomatic disorders, which causes the chronicity of the pathological process. Thus, in medicine, it is considered possible to exacerbate glomerulonephritis within five years after the disorder. This is the so-called period of remission (attenuation) of the disease. And the answers to the question: why exactly is an exacerbation of the disease and when it will take place in an individual patient, in medicine does

not exist.

In general, many researchers cite age-related periodization of human ontogenetic development and identify certain cycles and phases of somatic, sexual, neuro-mental, and intellectual maturation. We find this in the writings of R. Brun (2016), who examines the issues of constitutional biology and anthropometry; G.A. Fava, F. Cosci and N. Sonino (2017), who studied psychology of high school students; P. Fink (2017) - in age psychology. P. Henningsen, et al. (2018) points out that these cycles and phases of development "are characteristics of time" and they cannot be independent of the course of the central clock of the individual. Taking into account the continuity of the central clock, B.Y. Tsukanov (2000) suggested that the 1: 4 gear ratio is stored in individuals in the range  $0.8 s \leq \tau \leq 1.0 s$  when experiencing multi-day, multi-month and multi-year cycles. Based on a number of studies (Didukh et al., 2020), B.Y. Tsukanov (2000) assumes that the gear ratio remains unchanged regardless of whether the individual is in a state of alertness or in a state of sleep. Within these periods, in some people, a gradual inversion of the temperature curves of the circadian cycle is observed during the transition from daytime to nighttime. J.E. Birren (2014) have noted this in their writings. In the studies of B.Y. Tsukanov (2000) it is found that in individuals with hypertensive tendency, there is a sharp jump in blood pressure through periods  $T_n = 3$ . According to the scientist, a sharp drop in blood pressure, which coincides with the period  $T_n = 3$ , can be considered as a kind of mark of the moment "end-start" of the multi-day cycle in the time experienced by the subject.

For a "medium-sized entity:

$T_n = 5 = 1.92 \text{ years} = 2 \text{ years}$ , ie the two-year cycle obtained by P. Henningsen et al., 2018 and J.E. Birren (2014).

At  $n = 6$   $T_n = 6 = 8.51\tau$  (years).

This period was called B.Y. Tsukanov (2000) a great biological cycle.

The periodization of individual development is based on the fact that in "science, psychology, medicine, pedagogy" accumulated a huge fund of knowledge about the unevenness and heterochrony of growth and differentiation of tissues, bone and muscle system, various glands of the internal secretion, the main departments of the CNS ... known phenomena of heterochrony of general somatic, sexual and neuro-mental maturation" (Savenkova et al., 2019c). If the life of the individual consists of a series of cycles that change each other, will not a large biological cycle appear during periods of exacerbation, remission (attenuation) and convalescence (recovery) of psychosomatic diseases? Through long-term observations of heterochronous changes in H. Ehrenwald (2014) ontogeny, it was established that the processes of somatic, sexual, and neuro-mental maturation are accelerated, and the processes of maturity and aging are slowed down. Based on the magnitude of C (a large biological cycle), B.Y. Tsukanov (2000) showed that the infant period continues  $\frac{1}{4} C$  (Tsukanov, 2000). To reach the beginning of childhood, it is necessary to live  $\frac{3}{4} C$ . By the beginning of puberty, it is necessary to live half of the second major biological cycle, maturity continues  $3 \frac{1}{4} C$ , and late maturity lasts  $3 \frac{1}{2} C$  according to the age periodization of J.E. Birren (2014).

The purpose of the study is to predict the course of neurotic, stress-related and somatoform disorders,

taking into account the individual chronotype of the individual suffering from these disorders.

Analysis of research results. According to A.V. Kerbikov (2013), the age of the subjects, as a rule, imposes a mark on the degree of neuroticization of patients. The average age at which pathological development for traumatized individuals ended -  $13.3 \pm 1.4$  years, for hysterics -  $14.7 \pm 1.9$  years, for excitatory ones -  $22 \pm 1.9$  years (Tsukanov, 2020). The frequency and severity of reactions, as a rule, are greater than the older age of the subjects. Particularly pronounced phenomena of accentuation, and therefore, the risk of related disorders occur at the age of 21 years, and even more - after 31 years, ie the time factor significantly affects the emergence, formation and development of related neuropsychiatric diseases. In order to test the assumptions and predict the course of these disorders, we compare the duration of the biological cycle of each individual patient and the periods of exacerbation of the disease.

### **CONCLUSIONS**

The results of our study show that in different individuals their dominant disease manifests with a certain "C-periodicity".

Analysis of the age of patients from the date of birth to the onset of the disease shows that the place of least resistance is most affected at the end of a long large biological cycle or their long quarters.

Tracking the "C-periodicity" of diseases, it can be said that in the life of an individual there are a number of separate age points that must be critical. It is at these points that exacerbation of symptoms of psychosomatic diseases is observed. And why exactly at these points is the exacerbation of the disease? The answer to the question we find is in the assumption of B.Y. Tsukanov (2000) that the nature of temperament is associated with bioenergy processes in the body of an individual and any bioenergy cycle has a scan on the "arrow of the internal time" of the organism, in which the beginning and end of the cycle are separated by the duration of its period. During the end period, the body undergoes a number of internal changes that lead to external changes in physiological and psychological nature.

Based on the cycloid "sliding wheel" model of time, one can answer the question of the onset of dominant diseases. The cycloid arch according to the scheme of B.Y. Tsukanov (2000) reflects the complete rotation of the "wheel" of the biological cycle. If the areas under the arch provide meaning to the bioenergy potential of the individual, as suggested by Y. Krivonogov in his research, then the onset of psychosomatic diseases will coincide with the end of the biological cycle or the end of its long quarter, that is, with separate age points of life, which have potentials.

For most patients with neurotic stress-related disorders and somatoform disorders, it is common that the clinical manifestations of the disease not only coincide with the end of a quarter of long cycles and their ends, but also begin to recur with the frequency of EC, EC,  $1/16C$ ,  $3/4C$  depending on affiliation to the typological group. The disease is chronic in nature because it is not diagnosed in the early stages of ontogeny.

Thus, discrete counting of individual time leads to the fact that at the level of subjective experiences and behavioral manifestations of a person's life is uneven, that is, during the life of clearly distinguished periods in which the person is in optimal psychosomatic form, and at the beginning and end - at a



minimum.

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