

Integrating Biophysics and Psychoanalysis: A Breakthrough in Understanding the Mind

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Abstract

This study explores the integration of psychoanalysis with biophysical methods to understand the mechanism of human thinking and mood regulation. It demonstrates how verbal associations triggered by the object of attention significantly influence mood, supported by neurophysiological processes. By combining psychoanalytic approaches with biophysical data, the research presents an objective method for studying brain states, leading to more effective treatments for psychological disorders. The study introduces the chain verbal test, highlighting its potential for revealing thought patterns and emotional states, ultimately offering advancements in psychodiagnostics and treatment methodologies.

Keywords: Psychoanalysis; Pharmacology; Object of Attention; Mood; Chain Verbal Test

Introduction

When addressing issues related to traditional views on the nature of the so-called human factor, the enhancement of robotics capabilities, artificial intelligence, medicine, and others, the achievements of the so-called biophysical psychoanalysis [1-3] are still not taken into account.

Traditional psychological methods, such as surveys and interviews, rely on self-reports from participants, which can be distorted by personal biases and social expectations. This limits the objectivity of the data and does not allow for a complete understanding of an individual's internal state. The integration of the psychoanalytic approach with the biophysical one leads to the development of effective treatment methods based on an understanding of the relationship between mental states and neurophysiological processes. This allows for the acquisition of objective data

about brain states, contributing to the identification of patterns previously unnoticed in traditional research, leading to a more comprehensive understanding of how emotional and cognitive processes interact, and ultimately resulting in real assistance to patients in psychodiagnosis and the development of treatment methodologies.

We have investigated the impact on human mood of the verbal associations elicited by the object of attention. It turned out that these associations are so closely linked to a person's mood that when the object of attention is changed, the mood shifts dramatically. The neurophysiological basis of this phenomenon can be found in the works [4, 5], which show that attention is realized by two interconnected brain subsystems; one of them, so to speak, monitors the leitmotif, i.e., maintains the goal, while the second sharply switches attention and significantly changes the mood (Figure 1a).



Figure 1a: Two interconnected brain subsystems for attention. The subsystem maintaining the goal is presented here as the horizontal line, the subsystem sharply interrupting this attention corresponds to the vertical line

The idea of two separate networks of attention in the human brain - namely the dorsal and ventral networks: for, respectively, voluntary distribution of attention and for re-orienting attention to unexpected events [4], respectively - has inspired a tremendous amount of research in recent years [5].

This system of interconnected attention systems can easily be turned into a convenient mechanism for studying thought by constantly causing it to restart. To do this, it is enough to direct the output signal of the second system to the input of the first.

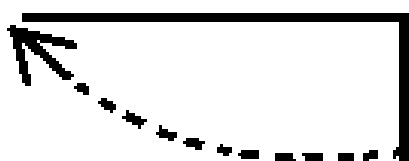


Figure 1b: The attention subsystems interact in a natural state, after which a reboot (dotted line) is semi-artificially performed

Apparently, this can be done in various ways in animals, but when studying human thought, we use what is known as the chain verbal test [1-3]. At the beginning of the test, we ask the subject to accept the proposed testing algorithm, where, having chosen an arbitrary word, they will start writing associations to this word, and after about 10 associations, complete this stage, and, looping the testing, choose the last word just written as the next, this time not arbitrary word, and write the next ~10 associations to this word. And so on.

In other words (in terms of article [4]), the ideology of testing is based on the well-known experimental identification in the brain of a pair of separate but closely interacting so-called dorsal and ventral attention networks (DAN and VAN), which implement attention that, firstly, supports the consciously chosen goal (leitmotif), and, secondly, shifts consciousness to distracting stimuli. The idea of the test is to quickly return from VAN back to DAN, which leads to the emergence of oscillations: this is no longer free

thinking, but "forced" thinking. The creation and maintenance of "forced thinking" is realized after the subject agrees to perform the algorithm of the chain verbal test, where a randomly selected initial word of the test sets the initial leitmotif, which the subject involuntarily supports by writing down associative words related to this leitmotif (thereby maintaining the operation of DAN). Upon completing the listing of these associations at any convenient moment for the subject (this is the moment of transition from DAN to VAN), the subject switches to writing associations to the last recorded word (this is the moment of transition from VAN to DAN). Typically, the test takes no more than half an hour to complete.

At the moment, we are processing each of these queues of associations with a word sentiment assessment program (see below), and a series of numerical sentiment assessment results are processed with another program (a program for 'coloring' in the colors of figure 1c).

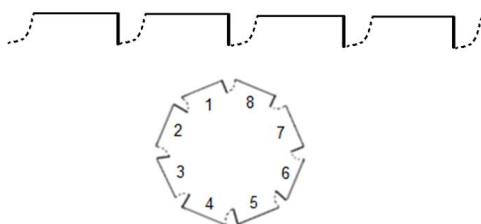


Figure 1c: A chain of looped attention subsystems is presented at the top. In reality, this can create a cyclic structure from 8 sequential mood states. The dotted curves correspond to the stages of semi-artificial restart of the pair of attention subsystems.

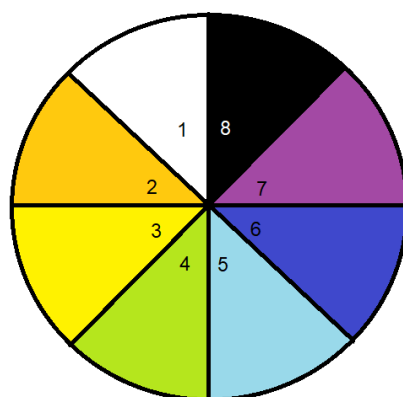


Figure 1d: The circle of mental states / states of mood. Two almost emotionless states ('input'(#1) and 'output' (#8)) are represented by two colorless sectors – white and black, while the other states are the sectors in the figure, colored in various colors of the rainbow; they are clearly associated with good and bad moods of different intensity and specificity. The sectors of the extremes of good and bad moods are colored, respectively, yellow (#3) and blue (#6).

We have found a rough technical analogy to this system - the switching of positions in a stepper motor shaft: there, too, the starting position of the rotation angle is taken into account, as well as a standard jump magnitude and the ability to change its direction. Our research has shown that in the attention switching system, there are eight distinguished states, as there may be in a specially selected stepper motor. In figure 1c, the phenomenon of mood state dependence on the object of attention is presented in the form of a circle of mental states. (Figure 1d).

Relatively emotionless input and output mental states, which make it possible to monitor physical reality on a relatively calm emotional background (this is a special mental state of "wakefulness") and correct the available part of physical reality by changing one's own behavior (this is already a special mental state of "action"), are depicted, respectively, as white and black sectors of the circle. The rest of the mental states are more clearly related to emotions. The corresponding sectors are painted in different rainbow colors in the drawing and are concentrated near the yellow and blue sectors - the centers of positive and negative mood. The center of negative mood helps to survive, and the center of positive mood also helps to solve the central biological task: the production of offspring [6]. The positive sector and its pair of neighbors are colored in Figure 1 in warm colors: orange (#2), yellow (#3) and green (#4), and the negative and its nearest neighbors are colored in cold colors:

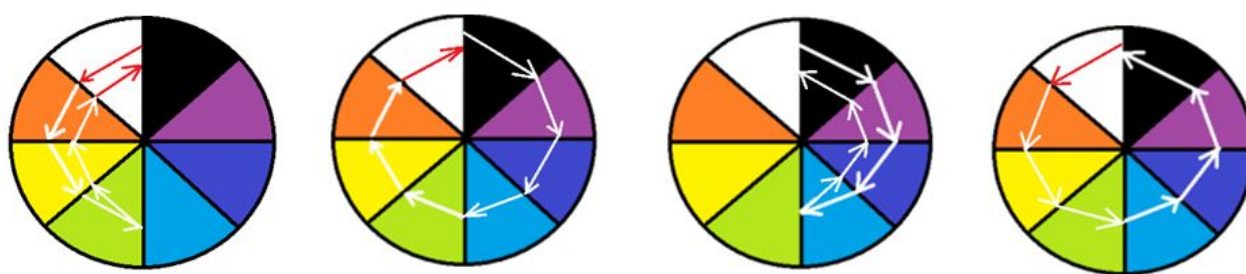


Figure 2: Four fragments of thinking **pipo**, **nipo**, **nino** and **pino**, detected by the so-called chain verbal test when scanning thinking in a biophysical version of the psychoanalytic method of free associations [6-13]. A series of arrows indicate the location and direction of the mood switches accompanying the testing process. In fact, **pipo**, **nipo**, **nino** and **pino** are variants of the raid of a healthy adult's thinking from the fundamental biological Self to his social Self and back.

The subject of this article is one of the applied aspects of using the biophysical variant of the psychoanalytic method of free associations - the sensitivity of this tech-

nique to changes in the course of mental processes in humans. cyan (#5), blue (#6) and purple (#7). In fact, with this simple picture, we differ very little from primitive microorganisms, whose set of corresponding colors - black, white, yellow and blue - is only slightly simpler; the last two are the well-known positive and negative taxis.

In biophysical psychoanalysis, it is empirically justified that the upper point of the circumference of the mental circle can be identified with the point of biological self-awareness (I, Ego, Self) of a person: first, it is defined by Freud asexual ID in an infant, then it is could called «I--Mowgli» in a tween, which grows into a kinesthetic Self - an important fragment of a composite Super-Ego in an adult. The lower point of the circumference of the mental circle in humans as a biosocial being is associated with a person's awareness of himself as a member of a community - family, nation, humanity; this is the so-called social Self.

Figure 2 presents a view of the characteristic blocks of associations: **pipo**, **nipo**, **nino**, and **pino**, which, as it turned out, can be easily identified in the test results. (See Fig. 2). Here, the letters **p** and **n** originate from the words **positive** and **negative**, respectively, and the letters **i** and **o** from **in** and **out**. For example, the fragment - **po** - is deciphered as **positive out**, i.e., as "being in the area of positive mood, an outgoing fragment". Additional symbols "+" and "-" (see Tables 2, 3, and 4) indicate the presence of "extra" themes of associations and, correspondingly, their lack.

nique to changes in the course of mental processes in humans.

Results

Everyone can easily define the picture of their thinking in the images of biophysical psychoanalysis using the Internet resource golosaVgolove.ru [8]. There, a 300--page monograph by the first author of this article is presented, describing the process of chain verbal testing, where the

last in the series of associations determines the theme of the next series of associations. An automated version of the chain verbal test, which facilitates and standardizes the testing process, is also provided on this website.

Table 1 can be an instructive example of successful testing.

Table 1: An example of a test result colored in accordance with Fig. 1 , supplemented by predominantly 8-line fragments (cf. Fig. 2). On the left, see the verbal objects of attention, in the center are the verbal associations to them, on the right – the codes.

Love:	colour #4	Life, Dreams, Relationships, People, Hugs, Care,
Care:	colour #3	Warmth, Gently, Comfort, Help, Support,
Support:	colour #2	Shoulder, Backing, Friend, Brother, Support,
Backing:	colour #1	Hand, Back, Body, I, Pair,
pipo		
Pair:	colour #1	Second, Friend, Husband, Family, Friends,
Friends:	colour #2	Strength, Development, Rest, Conversations, Travels, Meeting,
Meeting:	colour #3	Date, Expedition, Walk, Friendship, Love, Greeting,
Greeting:	colour #4	Handshake, Hugs, Hello, Meeting, Acquaintance,
Acquaintance:	colour #4	Awkwardness, New, Name, Person, Conversation,
Conversation:	colour #3	Date, Meeting, Dialogue, Vis-à-vis, Trust,
Trust:	colour #2	Faith, Warmth, Hands, Close, Open up, Speak, Silence, Admission,
Admission:	colour #1	Truth, Reality, Honesty, Feelings,
pipo		
Feelings:	colour #1	Anger, Rage, Sadness, Joy, Happiness,
Happiness:	colour #2	Goosebumps, Heart, Warmth, Flowers, Sensations, Love,
Love:	colour #3	Joy, Agreement, Acceptance, Happiness, Kiss,
Kiss:	colour #4	Tenderness, Children, Man, Date, Feelings, Touch,
Touch:	colour #4	Fingers, Tenderness, Hands, Body, Soul, Love,
Love:	colour #3	Touch, Friendship, Passion, Heart, Tenderness, Life,
Life:	colour #2	Sprout, Growth, Movement, Crisis, Happiness, Acceptance,
Acceptance:	colour #1	Life, Development, Bad, Good, Truth, Pain, Joy,
nino		
Joy: Moment,	colour #8 Laughter,	Feeling, Emotion, Endorphins, Serotonin, Goosebumps, Smile,
Moment:	colour #7	Here, Now, Life, Feel, Body, World,
World:	colour #6	Planet, Human, Birth, Death, Science, Creation, Destruction,
Destruction:	colour #5	Collapse, Nullification, Fragments, Ruins, Ashes, Frame,
Frame:	colour #5	Ship, Debris, Ruins, Skeleton, Foundation,

Foundation:	colour #6	Base, Fundament, Knowledge, Skeleton, Back,
Back:	colour #7	Support, Spine, Muscles, Strength, Lineage,
Lineage:	colour #8	Family, Generation, Parents, Strength, Energy, Children,
pipo		
Children:	colour #1	Family, Husband, Love, Responsibility, Stroller, School, Education,
Education:	colour #2	Lessons, Knowledge, Science, Experience, Life, Development, Creation,
Creation:	colour #3	Create, Birth, New, Science, Realization, Purpose,
Purpose:	colour #4	Realization, Intention, Call, Nature, Matter, Soul, Heart,
Heart:	colour #4	Soul, Warmth, Blood, Love, Trust, Family,
Family:	colour #3	Life, Light, Love, Friendship, Trust, Care,
Care:	colour #2	Comfort, Help, Support, Friend, Tenderness,
Tenderness:	colour #1	Love, Touch, Embrace, Love, Care,

The decryption of this test record can be written as a long mental code popipopiponinopipo. However, we additionally interrupt all such codes with a space at the moment of crossing the top point of the mental circle. As a result,

this code takes on a more readable form po pipo pipo nino pipo. This code can also be represented in the form of a figure-mentogram (Figure 3).

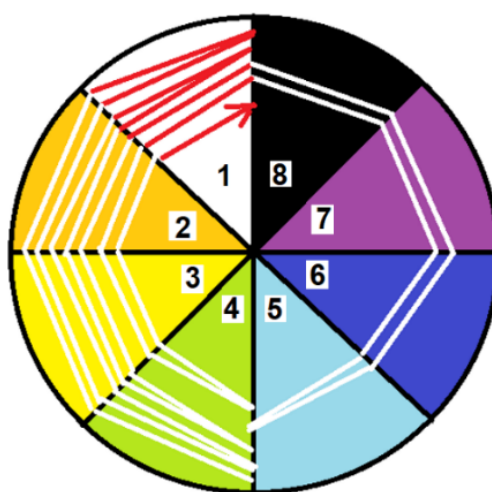


Figure 3: A mentogram is a graphical representation of mental code (in this case, the **po pipo pipo nino pipo** code). If Figure 2 illustrates "words", then in this example the mental movement begins with a "half-word"; the essence of this phenomenon will be explained below. The numbers 1-8 mark the numbers assigned to mood states.

Based on computer analysis of the emotional tone of words (in this case, using the VADER method), the following numerical score for the positive emotional content of words in the more reliable (left) half of the mentogram has been accumulated: 0.13, 0.25, 0.43, 0.18. As hypothesized in biophysical psychoanalysis, the maximum of good mood occurred in the yellow sector. The calculations were

performed by artificial intelligence – a chatbot using the gpt-3.5-turbo language model for numerical assessments of the emotional content of associations in tests. See Fig. 4 for a graphical representation of the multi-week evolution of the mood octagon. For this, a 35-day fragment of the series of mental codes extracted from a multi-month series of volunteer tests was used (see Table 2).

By the way, this volunteer turned out to be a well-motivated man. Having set a goal to get rid of the daunting mental problems that arose before him, he resolutely gave up the tempting practice of smoking narcotics and tried to get rid of schizophrenia, which was discovered shortly after he graduated from university. For salvation, he purposefully sought any techniques, including those that can now be attempted to be called palliative. He complained, "...I went to church, and there they told me that people like me used to be burned at the stake, and I renounced Satan. I also went to the psychiatric hospital, and there they gave me injections. And I went to magicians in Moscow, which gave a temporary and not long-lasting result...". Importantly, during this time, he did not interrupt the supportive treatment at the psy-

choneurological dispensary. During our epistolary communication, due to the complexity of possible problems, we had to maintain mutual incognito and limit communication to the exchange of emails. Not having received immediate help, the volunteer switched to close interaction on the Internet with a site that united people with schizophrenia. The archive containing the test records of this unnamed volunteer, as well as the journal of his daily self-observations for this period, was only needed after biophysical psychoanalysis [7, 10] reached a qualitatively new level (see [1-3]), using, among other things, the possibility of calculating quantitative assessments of word tonality. Additional information was used from the Internet site golosaVgolove.ru. (golosaVgolove means VoicesInsideHead in Russian)

Table 2: A five-week fragment of the multitude of tests conducted by the volunteer in his free time in the evenings daily from December 18, 2010, to April 28, 2011. The codes of completed 8-line sections of the mental process are highlighted in bold (see Fig. 2). These were required below for constructing Figures 4 and 5.

Date of Experiment	Mentogram Code
08.01.2010	pipo pipo--
09.01.2010	--nipo pino+++
10.01.2010	nipo++pipo+
11.01.2010	--pino pino pi
12.01.2010	nipo pino
13.01.2010	pino
14.01.2010	nipo -pino
15.01.2010	pino pino--
16.01.2010	+++nino pipo nipo
17.01.2010	nipo- -pino-- --nipo-
18.01.2010	-po ni+
19.01.2010	+pipo nino
20.01.2010	+++pino+++++
21.01.2010	pipo nipo ni-
22.01.2011	pipo nino--
23.01.2011	pipo pipo
24.01.2011	pipo pi
25.01.2011	po pino nino--
26.01.2011	+nino--
27.01.2011	unencrypted

28.01.2011	unencrypted
29.01.2011	pino+
30.01.2011	+nipo nino
31.01.2011	-nipo pino ni+
01.02.2011	nipo nino-
02.02.2011	-nipo pino nipo
03.02.2011	po nipo pino++
04.02.2011	++nino+++
05.02.2011	-pino nipo-
06.02.2011	-pino nipo-
07.02.2011	nipo pino-
08.02.2011	-no nino ni
09.02.2011	++++pipo++++
10.02.2011	+nipo nipo
11.02.2011	nino pipo+

Table 2 provides sufficient information for accumulating satisfactorily reliable numerical assessments of emotional tonality across all sectors of the mental circle. Figure 4 illustrates that during the first (I) and second (II) weeks of this series of tests, the volunteer exhibited a wave-like mood curve. An averaged wave has also been added to the figure for weeks I and II. During the third week (III), the correct wave-like change in mood was noticeably disrupted. This was partly due to the depletion of tests as a result of the psychoactive substance used: at the beginning of week III, the volunteer was given a scheduled injection of haloperidol decanoate at the corresponding medical institution. On the fourth (IV) and fifth (V) weeks, the correct wave-like form of the mood curve was restored. An averaged wave for weeks IV and V has also been added to this part of the figure 4.

The waves of emotional tonality assessments (Figure 4) were accumulated from those 35 tests, the mental codes of which are presented in Table 2. The calculations were performed in Python using a program that employs the VADER method. Since the VADER method's database is created in English, the Russian words and expressions

that appeared in the test series were first translated into English, and only then were the numerical tonality assessments calculated. The result of the calculation was a number marked as "compound".

```
import nltk

from nltk.sentiment.vader import SentimentIntensityAnalyzer

# Initialize the sentiment analyzer
sid = SentimentIntensityAnalyzer()

# List of words for analysis
words = ["Cars, Rabbit, Plastic, Teddy Bear, Toy Soldiers"]

# Evaluate the tone of each word and print the result
for word in words:
    ss = sid.polarity_scores(word)
    print(f'{word}: {ss}')
```




Figure 4: Accumulated mood waves (in this case, waves of values of emotional tonality ratings) for the I and II weeks of the 5-week, for the III week (at the beginning of which the injection was made), as well as for the IV and V weeks of the cycle, running along the eight sectors of the diagram. The phase shift of the waves between adjacent points is 45 degrees. Vertically, an average numerical assessment of mood is presented, which reaches -1 for extremely bad associations, and +1 for extremely good ones.

Figure 4 clearly shows the expected mood extremes in the third and sixth sectors of the mentogram. Changes in the fifth to eighth sectors, which distorted the correct form of the wave in the third week of testing, can be attributed either to the depletion of statistics or to a change in the volunteer's state of thought; in any case, it was to some extent caused by the medication.

Since after such processing, the results of weeks I and II of testing strongly resemble the results of weeks IV and V of testing, additional averaging was performed over

this set of weeks, and this averaged result was compared with the outcome of week III of testing when the patient was under the influence of the recently introduced medication. From Figure 5, it can be concluded that in the wakefulness sector (1) and the "warm" sectors (2÷4), i.e., the left side of the mentogram, there was virtually no observed effect of the drug. However, the results of the right half of the mentogram (its "cold" sectors (5÷7) and the action sector (8)) generate hope for revealing an effect, although these sectors were poorly supported statistically.

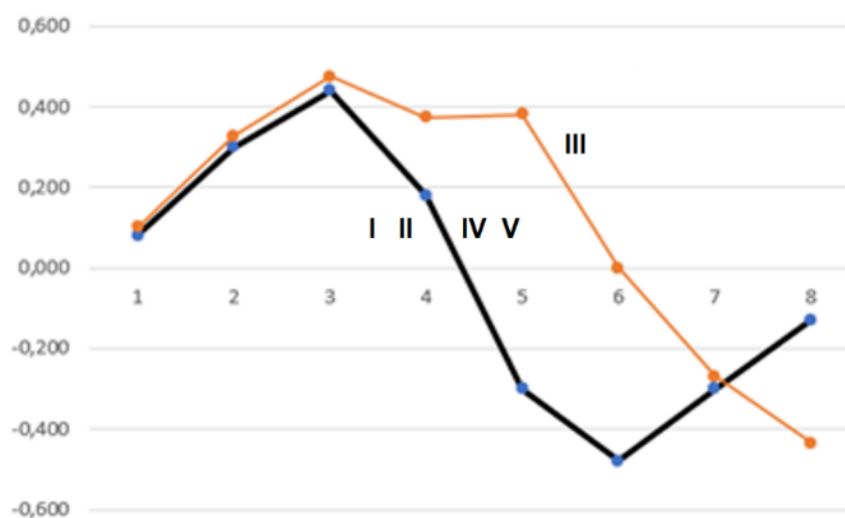


Figure 5: Comparison of the average test result for weeks I, II, IV and V, which can be considered a control, with the result of week III, when the patient was exposed to a new dose of a psychoactive drug. The axes are described in Figure 4.

Since the administration of haloperidol decanoate to the volunteer is a process with a 5-week period in this case, the statistics of the picture for the third week of testing

can be improved by using the results of subsequent periods of this multi-month experiment, namely by using two existing later full analogs of the third week from the archive (see Tables 3 and 4).

Table 3: Week IIIa – a weekly fragment of testing, the first analog of the third week of the experiment.

26.02.2011	no pipo++
27.02.2011	po nino pipo--
28.02.2011	po pi-
01.03.2011	pipo pipo--
02.03.2011	+po pipo--
03.03.2011	-nipo
04.03.2011	pipo

Table 4: Week IIIb – a weekly fragment of testing, the second analog of the third week of the experiment.

02.04.2011	nipo+++
03.04.2011	pipo
04.04.2011	+nipo
05.04.2011	no pino+
06.04.2011	+pipo
07.04.2011	+pipo+
08.04.2011	+nino++

With the improvement of statistics by adding two analogs of the third week, it is evident that the original level of negative emotions was retained in the seventh mood state. In biophysical psychoanalysis, this may indicate the emergence of self-awareness in a suppressed state, practically depression, and possibly, a specific activation of hearing. This unusual auditory image may be perceived by the patient as a "voice in the head." According to medical recom-

mendations, subsequent doses of haloperidol decanoate are administered every 2-4 weeks, but the volunteer regularly extended this interval to 5 weeks. Perhaps that is why, instead of the expected minimum in the sixth sector of the mentogram, after improving the statistics, the minimum fell into the seventh sector. The new curve in Figure 6 also took on a wave-like form as a result of accumulation and came to resemble the wave constructed for weeks I, II, IV, and V.

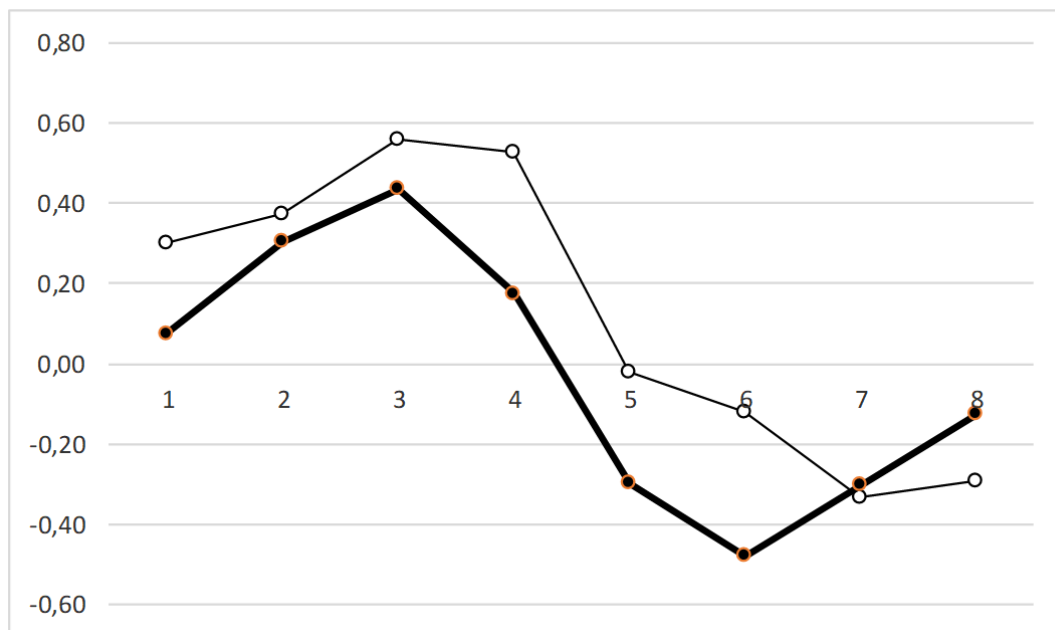


Figure 6: The picture of the modification of the Fig. 5 after the addition of the results of the second and third analogues of the third week (see Tables 3 and 4), when the volunteer was similarly influenced by the next new portions of the drug. The axes are as shown in Fig. 4 and 5.

During the other four weeks of the considered 5-week period (see Fig. 5), there is no observed extremum of negative emotions in the seventh mental state as seen in Fig. 6, and the question arises as to how the "voices in the head"

of the volunteer were able to persist during weeks I, II, IV, and V, as well as in the corresponding weeks of other 5-week periods of the illness. See Table 5.

Table 5: The number of uses of the words "voice," "voices," etc., in the volunteer's daily morning and evening reports on their well-being over three 5-week testing periods. The drug was administered to the volunteer by his treating physician in a specialized medical hospital on the first day of the third week (on the 15th day of the periods under consideration). In columns 2÷4, the special days when the tests started from the vicinity of the bottom point of the mentogram, i.e., from the social I, are highlighted in bold.

Day Number in 3 Periods	1st Period	2nd Period	3rd Period	Anomaly Selection	Total Anomalies	Total, Pieces
1	2	9	1			
2	4	4	1			
3	0	2	2			
4	1	2	4	4	6	2
5	0	2	0			
6	2	1	2	2		
7	3	0	2			
8	1	3	4	3		
9	2	5	2			
10	7	2	6			
11	2	4	0	2	9	4
12	0	2	3	3		
13	1	2	1			
14	2	1	1	1		
15	3	3	1	3		
16	6	4	4	4		
17	2	2	3	2		
18	1	1	3	4	15	5
19	1	2	2	2		
20	3	2	4	3		
21	4	2	0	4		
22	5	1	0			
23	4	4	3	7		
24	2	1	4			
25	5	0	2		14	4
26	1	2	0	2		
27	1	0	2	1		
28	3	1	3	4		
29	1	0	3			
30	2	1	4	1		

31	11	4	4			
32	6	2	1	6	9	4
33	2	0	3			
34	3	1	1	1		
35	1	0	1	1		

Of course, the moment of writing the report does not coincide with the moment of testing, so the connection of "voices" indirectly manifested in the daily tests and "voices" mentioned in the volunteer's daily diary entries is only a trace of the positive correlation of these mental processes on a near-daily time scale.

The second, third, and fourth columns in Table 5 contain the number of mentions in the diary of "voices" during the three 5-week observation periods. From Table 5, it is evident that the weekly sums of diary mentions of "voices in the head" have a well-expressed maximum in the middle of the 5-week period (i.e., in the third week (the "injection week") and in analogs of this week in the two following 5-week periods); we are now talking about accumulated values of 6, 9, 15, 14, and 9 mentions of "voices" in the diary only on those days when the tests started in the vicinity of the bottom point of the mental circle. The peak value of 15 (in the "injection week") is at least greater than the neighboring values (9 and 14), which, in turn, are at least greater than the values from the middle of the interval between injections (6 and 9).

An interesting perspective arises: the observed minimum of mentions of "voices" in the middle of the time interval between injections, i.e., the values of 6 and 9, now requires explanation. The values of 14 and 9, i.e., the values in weeks IV and V (after the injection), exceed the corresponding values in weeks I and II (before the injection) of 6 and 9, and can be interpreted as a relatively weakly substantiated, but still, this is an argument in favor of the still remaining residual effect of the drug administration. The slightly elevated value of 9 in the week immediately before the injection may be a consequence of not following the medical recommendation of administering haloperidol decanoate every 14-28 days, rather than every 35 days. Thus, in the end, it turns out that in the center of the time interval between injections, the frequency of mentions by the volun-

teer of "voices in the head" actually decreased from 15 to 6, i.e., 2.5 times. The patient was "almost recovering" – such was the delayed positive result of the treatment two weeks later.

Additionally, it can be noted that the emotional minimum suggesting "voices" in Figure 6 was identified in the outcomes of the third week and its analogs after averaging over specially selected full-fledged fragments of the mental code, the perfect form of which was illustrated in Figure 2. And Table 5, which includes information about "voices" in our study, is already built on the volunteer's diaries; it also additionally attracts data on incomplete mental codes – codes of those tests that start in the vicinity of the bottom point of the mental circle as in the example of Table 1. Hence the thought that in these two different cases, the volunteer might have confused objects of different origins: apparently, the former are generated by the system servicing the work of the auditory receptor in the depressive mode of self-awareness, while the latter, not heard with already normally functioning hearing, are merely auditory images remembered during the mode of hearing in depression and retrieved from memory during automatic attempts to make sense of once misunderstood information.

The psychoanalytic basis for the patient's identification of "voices" among a multitude of other auditory images may be as follows: at the moment of the auditory system's imprinting of the "voice in the head" image, the self-awareness of a depressed person is already shifted from the no emotional kinesthetic Self (from the "very top" point of the mental circle) to the depressive Self (to the "far right" point of the mental circle), and this is accompanied by an actualization of hearing [7]. On the mentogram, this looks like the movement of the moment of "wakeful" self-awareness from the vicinity of the emotionally neutral junction of state 1 with state 8 to the vicinity of the junction of state 7 with state 6, accompanied by strong negative experiences. It

is precisely this shift in self-awareness (i.e., the Self) to the auditory zone that may be evidenced by such reports from patients with schizophrenia as "the television was talking to me," "the voices were scolding me and my family," and so on. Hence the suggestion: if at the right moment the patient is given a suitable antidepressant, i.e., at least temporarily relieved of depression, then the influx of new "voices" will cease, and the old voices will naturally continue to be gradually forgotten and will eventually disappear completely as they will be ultimately forgotten. For complete recovery from "voices in the head," the volunteer could have been advised to take antidepressants, especially during the third week and during its analogs in other 5-week cycles. However, the patient's mood noticeably improves with haloperidol during the week after the injection, which is confirmed by the upper curve in Figure 6. And yet, during this period, antidepressants are needed that will also raise the mood in the seventh and eighth states.

In Table 5, the data on the intensity of the manifestation of "voices in the head" on those days when the tests started in the close vicinity of the social Self, i.e., at the bottom point of the mentogram, are highlighted in bold. An example of a test with such an anomalous code is given in Table 1 and depicted in Fig. 3. It is precisely such an anomalous test start that can be considered an "instrumentally determined" sign of the presence of "voices in the head."

Discussion of Results

Table 5 also allows for a rough estimate of the number of tests needed to confidently detect the presence of "voices in the head." The last column of this table provides values that allow for assessing the probability of the occurrence of a test characteristic of this case. It shows that out of all 105 tests in Table 5, 21 tests correspond to "voices in the head." The probability that a test will be anomalous can be estimated as $21/105$, i.e., 0.2. The probability that a test will be normal is 0.8. The probability that N independent volunteer tests will all be normal is $(0.8)^N$. As the number N increases, this is, respectively, 0.8, 0.64, etc. It is easy to calculate that if no anomalous tests are found in the first 10 tests, the probability of the absence of "voices in the head" in further tests reaches 0.9; and when N becomes greater than 20, the probability of the absence of "voices in the head" in fur-

ther tests will exceed 0.99.

From the examples given, an important practical point follows: it can be said that in biophysical psychoanalysis, not only a new way of describing thinking has been introduced, but also a new method (practically, an express method) has been tested for researching the impact of pharmacological substances from the corresponding medical arsenal on human thinking.

Either haloperidol decanoate itself, the procedure for its application, or even both together have an obvious drawback: in the first week after the introduction of this physiologically active substance, there is not a decrease in the manifestations of "voices," but rather an increase, as if involuntarily launching an unnecessary (it can be called parasitic) parallel process of activating "voices." Since biophysical psychoanalysis has empirically established a connection between the bottom point of the mental circle and social self-awareness, the correspondence of the volunteer's thinking to the bottom point of the mentogram at the start of testing may mean that immediately before testing, the volunteer already had "supposedly social" communication, i.e., he had fictitious voices in his head. In other words, if testing begins at the moment of "supposedly social" communication, then the test start point turns out to be in the vicinity of the bottom point of the mental circle, and the test record begins "mid-sentence," similar to the test record presented above in Table 1.

Our study of the particular case of the physiologically active substance – the synthetic (i.e., cheap) psychoactive drug haloperidol decanoate – confirmed its effectiveness as a medication that stabilizes the thinking process on a large time scale. This is evidenced by the highly symmetrical, one might say, healthy form of mood modulation accumulated over weeks I, II, IV, and V of thinking against the background of continuous drug intake into the blood (see Fig. 5). The specific distortion of the mood modulation curve form, accumulated from the combined results of week III (the "injection week") and its analogs (Figure 6), indicates that this drug acts in mood states 1-6 also as an almost universal antidepressant, but in mood states 7 and 8, which lie precisely on the path of shifting self-awareness from a state of health to a state of depression, this drug no

longer acts as an antidepressant.

The peculiarity of the special pharmacological status of mood states #8 and #7 is currently just an experimental effect, but it appears quite promising and requires further experimental confirmation. Mood states #8 and #7 are associated with a decline in mood, and among the resulting associations, auditory ones become more frequent.

Since it is precisely depression (i.e., the movement of self-awareness into the auditory zone) that can lead to auditory anomalies, soon after another administration of haloperidol decanoate, "populating" the thinking of the depressive volunteer with new "voices in the head," treatment with haloperidol decanoate removes the issue for mood states 1-6, but for mood states 7 and 8, special antidepressants are needed: "antidepressants for mood states 7 and 8." This will require either the special development of such antidepressants or the identification of them among already existing medications.

Conclusions

1. Biophysical psychoanalysis opens up broad prospects for pharmacological research. In particular, an express method based on biophysical psychoanalysis has been proposed for studying the influences on thinking of physiologically active drugs from the arsenal of modern medicine.

2. A test has been proposed to detect an "instrumentally determined" sign of the presence of "voices in the head" in a patient, that is, a sign that does not depend on secondary factors. To do this, it is necessary to perform (for example, at half-hour intervals) a sufficiently long series of chain verbal tests of the subject and identify mental codes. If a code starting in the vicinity of the social Self is found in the first ten codes of these tests, then this subject may have "voices in the head."

3. A "dual interpretation" of the nature of the "voices in the head" phenomenon has been proposed. It is based on the notion that as a representative of the animal world, humans are biologically evolved to predominantly reside in the biological Self, that is, to predominantly monitor changes in physical reality and react to them as possible. However, to solve tasks of a social aspect, sometimes partic-

ularly complex and not very natural, i.e., difficult, without obvious analogs in nature, humans use their additional "frontal-lobe" abilities of social self-awareness/interaction. As shown in Figure 2, in the process of thinking, an adult regularly enters the social Self. The activation of the social Self expands the possibilities for social communication, but it also creates the opportunity for difficult-to-control "supposedly social," i.e., fictitious communication. This explains the reason for the certain success of "treatment with physical labor," i.e., at the expense of the social Self, the forced activation of a person's biological Self, their kinesthetic self-awareness. However, there is still an insufficiently publicized alternative easy way to achieve the same effect: in biophysical psychoanalysis, the convenient alternative to "treatment with physical labor" is the performance of a chain verbal test. It has been repeatedly verified that performing the test leads to the desired finishing of the mental trajectory in the biological Self (see Figure 3). The basis of this phenomenon lies in the kinship of the nature of the phenomena of thinking, chain verbal testing, and ordinary dreaming, apparently based on the presence of two interconnected attention systems – the so-called dorsal and ventral. However, our volunteer's "voices" did not reduce their activity despite evening testing over several months. Thus, further clarification is needed here. Perhaps the volunteer's recovery from "voices" was hindered by the fact that in the depressive middle week of each 5-week period between injections, his memory was regularly "populated" with new "voices," and to avoid this, special antidepressants should have been taken at this particular time.

4. A division of "voices in the head" into two categories based on their origin has been proposed. The first are empty creations of faults in the accentuated auditory system and could arise in any person who either fell into depression without apparent reasons. The second type of "voices" arises during fundamentally hopeless attempts at human communication with this emptiness; it is the attribution of independent status to the "voices" that is the crossing of the boundary into madness. The homolog of a "voice" is an ordinary shadow: it also exists objectively, and it is just as dependent. If a person communicates with a shadow, is he not insane?

5. The question of improving the method of treat-

ing schizophrenia with haloperidol decanoate raises the issue of the desirability of using certain "antidepressants for the 7th and 8th mood states". Before the creation of biophysical psychoanalysis, "antidepressants for the 7th and 8th mood states" were inconceivable: that time the discussion was only about good and bad mood, that is, the mood scale was too coarse, primitive.

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Conflict of Interest

The authors declare that there is no conflict of interest.

Compliance with Ethical Standards

This work does not contain descriptions of any research involving animals as subjects. The work is based on the use of non-contact testing of human thinking processes. All relevant materials were provided by these individuals, firstly, voluntarily and, secondly, anonymously, meaning their rights cannot be claimed or proven. Ethical standards have thus been upheld.

References

1. VA Kolombet, VN Lesnykh AV Yelistratov (2023) Psychoanalysis as a Biophysical Method // Proceedings of the Institute of Engineering Physics, 4: 2-5
2. VA Kolombet, VN Lesnykh, VV Kolombet (2024) Representation of the Structure of Natural Intelligence in Biophysical Psychoanalysis // Proceedings of the Institute of Engineering Physics, 1: 13-7.
3. VA Kolombet, VN Lesnykh, AV Yelistratov (2024) Prospects for Research on Psychoactive Substances in Biophysical Psychoanalysis. Proceedings of the Institute of Engineering Physics, 2: 49-56.
4. M Corbetta, GL Shulman (2002) Control of goal-directed and stimulus-driven attention in the brain. Nat Rev Neurosci. 3: 201-15.
5. S Vossel, JJ Geng, GR Fink (2014) Dorsal and ventral attention systems: distinct neural circuits but collaborative roles. The Neuroscientist, 20: 150-9.
6. Kolombet VA, Panchelyuga VA, Lesnykh VN (2022) Self-reproducing Automata in the Universe: Life, Universal System of Tripling Periods, Fundamental Interactions // Proceedings of the Institute of Engineering Physics, 2: 2-4.
7. Z Freud (1995) Introductory Lectures on Psychoanalysis. Moscow: Nauka.
8. VV Kolombet. Website golosaVgolove.ru on the Internet.
9. VA Kolombet (1997) Mental Worlds. // Consciousness and Physical Reality. 2: 15.
10. V Kolombet (2001) Transphysical Worlds. – In: V. Kolombet. Transphysical Worlds. The Origin of Names (Moscow: KRON-PRESS, 2001).
11. VA Kolombet (2003) Stendhal Syndrome in the Light of Hypnography. // Applied Psychology and Psychoanalysis, 2: 11.
12. VA Kolombet (2006) VMM – The Brain's Computing Machine. // Bulletin of Kaluga University 2 21.
13. VA Kolombet (2008) Introduction to Hypnographic Psychoanalysis (Moscow: LLC Mailer, 2008).

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