ALTERED STATES OF CONSCIOUSNESS - CHARACTERISTICS AND USE.

Nikola Pirovski[1], Faisal Saghir[2]

[1]Department of Anatomy, Faculty of Medicine, Thracian University, Stara Zagora, Bulgaria

[2]Student , Faculty of Medicine, Thracian University, Stara Zagora, Bulgaria

Abstract

The scientific understanding and using of altered states of consciousness (ASC) as a psychophysiological phenomenon that could be the action and tool to achieve programmed success of each person. It could be used as an "antidote" for external control of consciousness, behaviour or actions of a man, a crowd or a society. Objective: A brief description of the altered states of consciousness as a concept in the narrow sense, and a methodology for their use as an optimal tool for success. Materials and methods: Psycho-physiological substantiation of consciousness through heuristic and systematic thinking in the holistic context of the Spiral Theory of the Human Body. Results: ASC have a place in psychology as an important tool for transforming the human personality into a modern innovative product. There are opportunities for conscious use of a dynamic spiral flow of successive altered states of consciousness to increase the body's adaptive abilities.

Keywords: *consciousness, adaptation, altered states of consciousness, psychophysiology, suggestion, meditation, psychoanalysis, prayer, STHB, ASC*

Introduction

Research related to the human brain, consciousness and altered states of consciousness, and their scientific characteristics in terms of psychophysiology, anatomy, psychology, biocybernetics, synergetics, pharmacology and others, and their practical use in the life of the individual and of human society, are increasingly at the center of the scientific pursuits of the twenty-first century. The progress in transport, the unprecedented quantitative and qualitative leap in communications, the active development of artificial intelligence, the depreciation of traditional religious and moral practices and the rise of transhumanism with the growing fusion and integration of technology in human life and psyche, lead to critical accumulation of factors and the possibility of a qualitative new understanding of consciousness.

In psychology, consciousness is seen as a mental activity that provides a purposeful reflection of the outside world and the separation of man from the environment, as well as his opposition to himself (self-consciousness), i.e. preliminary, mental construction of actions and anticipation of their outcome with control and management of personality behaviour [1]. In materialist philosophy, consciousness is seen as a property of highly organized matter for psychological reflection of reality, as a conscious being, a subjective image of the objective world, as a subjective reality as opposed to the objective, as ideally as opposed to the material and in unity with it. In a narrower sense, consciousness is understood as a higher form of mental reflection, a property of the socially developed person, an ideal side of the purposeful labour activity of the person. In sociology, consciousness is interpreted as a collection of all forms of cultural and spiritual life of society. In medicine, consciousness is a state of the brain in which the body has the right orientation for time and place, feels, thinks and controls the volitional functions of its nervous system. Quantitative changes in consciousness are related to qualitative ones, but there are exceptions such as sleep and the other ASC [2]. In psychoanalysis term conscious is used mainly as consciousness or conscious, as an opposition to other terms - unconscious, preconscious. Despite millennia of analysis, definitions, explanations and debates by philosophers and scientists, consciousness remains puzzling and controversial. Quantitative and qualitative changes in consciousness due to normal physiological mechanisms (sleep), trauma (obnubilation, somnolence, coma), and psychiatric illness (including substance abuse) remain in the broad meaning of the term ASC, and beyond the central theme this report. There are also various circumstances that can change the relationship between the mind and the world

in less drastic ways, producing so-called altered states of consciousness (in the narrow sense). [4]. Some altered conditions occur naturally, others may be caused by drugs or brain damage and may be accompanied by changes in thinking, disturbances in the sense of time, feelings of loss of control, changes in emotional expression, changes in body image, changes in in the meaning of concepts, etc. [5, 6]. Moreover, "human activity is determined by the dominant tendencies in the structure of the personality" (E. Fromm, 1990), and the "integrity of the personality" (K. Jung) is achieved when the main pairs of opposites are relatively different, i.e. when the two parts of the whole psyche, conscious and unconscious, are connected to each other and are in active connection on the path to individuation". Burnout syndrome has become a term for an extreme form of over satisfaction and nihilism due to a crisis in the understanding of consciousness and soul.

Neuroanatomy and neurophysiology are part of the morphological substrate that determines consciousness and on which it depends to the greatest extent. The human brain is made up of 80-100 billion neurons, which consist of a cell body with branched growths - dendrites and axons, and supporting cells - glia. A certain type of neuron, called grid cells in the older part of the brain, forms a hexagonal spatial structure (network) and is activated depending on the movements of a living organism in an imaginary spatial grid reflecting its position and orientation (for the discovery of this mechanism was awarded the Nobel Prize in 2014). Based on this, a new theory of brain function (Thousand Brains Theory) was developed by Jeff Hawkins of Numenta. According to her, in the brain in the neocortex of groups of hundreds of neurons combined in multi-layered vertical columns (modules), in which models of the environment are formed. The whole set of such models exists parallel in the neocortex, and the distant connections between neurons make it possible to synchronize them. Thus, the work of the neocortex is to build complex network interactions between many "small" models that work simultaneously, forming the illusion of a complete perception of all variants of the world, to hierarchically choosing a single model of the world around. As a possible element to the described network neural structure, we can add the new discovery of a new type of human neuron - "rosehip neuron". With very compact dendrites (branches that receive signals from other neurons), and with many branches for various connections with others neurons, as well as large "bulbs" at the end of their axons, they release chemical signals to other neurons. These "rosehip neurons" make up about 10% of the first layer of the neocortex - the most complex part of the cortex that is connected to the eyes and hearing. "Rosehip-like neurons" are associated with excitatory neurons called pyramidal cells, which are also associated with the level of human intelligence, which makes up two-thirds of all neurons in the cortex. "Rosehip-like neurons" act as inhibitory neurons, limiting the activity of other neurons. [7].

The neuro-physiological mechanisms for this dominance are related to the phenomena of Functional system of Anokhin and Dominant of Ukhtomsky (DU) - dynamic, self-regulatory, temporarily dominant reflex systems (internal, external and social). For the system-forming factor they use the useful adaptive result, functionally uniting different organs, systems and processes, and for the Dominant - and nerve centers of the spinal cord, subcortical structures or cerebral cortex. For DU, it is mandatory that the primary source of excitement is in one of the departments of the central nervous system, which directs the work of the nerve centers at the moment and determines the vector of behaviour. The formed DU has four typical properties: 1. stable arousal, 2. increased excitability (due to which its next property arises) 3. ability to sum up various stimuli with the participation of the hippocampus in the brain (responding to signals with low probability of realization) and 4. expressed inertia. The mechanism of Dominance increases the ability of the subject to adapt through recombination of stored traces and expanding the range of perceived external signals. Through it, unconscious selection is made on the basis of dominant motivation, while the secondary conscious selection is related to the functional specialization of the two hemispheres of the brain acting in "dialogue". The left plans,

analyzes as a serial processor, operating with discrete concepts corresponding to whole categories of objects and establishes the relations between them; its activity is based more on future time and induction (contains more dopamine, GABA, acetylcholine; greater sensitivity to neuroleptics). The right (provides a complete synthesized, analogous description of the world; its activity is based more on the past and deduction; it contains more serotonin and norepinephrine; greater sensitivity to alcohol). Asymmetry is a necessary condition for the realization of the processes of higher nervous activity. This includes the dynamics in the creation of temporal connections in the direction from asymmetry to symmetry and again to asymmetry in the activity of the brain, whose activity is optimal in the synchronous activity of its two hemispheres. The right and left hemispheres of the brain fit differently in the coordinates of time. The activity of the right is mainly related to the focus on past events, while the left is oriented towards the future and is activated every time you need to analyze a new situation and search for optimal solutions for it. One of the most important functions of the front sections of the new cortex is to predict upcoming events. The left hemisphere determines the very probable events and forms the regularity of the appearance of signals, and the right hemisphere assesses the uncertainty of the environment and predicts the unlikely events. The image of the object and its innate or acquired visual generalized symbol, which are the basis of object thinking, is formed in the right hemisphere, and its sound, verbal, conceptual, and functional designation- in the left hemisphere. Music activates the right hemisphere, tasks that require memorization- deep temporal structures. The primary processing of emotionally coloured visual impressions is also related to the right temporal cortex, from where the excitatory impulses propagate through the amygdala complex in the anterior frontal part. The ability to understand the language is related to the connection between the motor-speaking areas in the left hemisphere and other areas of the cortex. The anterior parts of the cortex of the left hemisphere of the brain and the anterior verbal area of Broca, screening only motivationally significant information, are of leading importance in the process of awareness. The developed imagination is related to the activity of the frontal, occipital and parietal areas of the right hemisphere. The activity of the right auditory temporal area of the cortex is associated with the emergence of sound rhythmic images in the brains of poets, and the appearance of words and rhymes testifies to the involvement of the left hemisphere in the creative process. The functional asymmetry of the brain is manifested in the predominant reflection of the emotional state of the person in the facial expressions of the left half of the face, which indicates the predominant activity of the right hemisphere. The functional asymmetry of the two cerebral hemispheres and their interaction are today considered to be the neurobiological basis of the interaction between the conscious and unconscious components of the personality [8, 9, 10, 11].

Emotions are an important technological factor in the formation of ASC, especially since the basis of the psychotropic action of substances is their impact directly on the emotional sphere. Today's knowledge of psychophysiology and anatomy of the brain proves that the needs, motivations and emotions have different morphological substrates, and that the hypothalamus is the key structure only for realizing the most ancient supporting function of emotions in solving the universal reflex behavioural task- "fight or flight ". The interactions in the brain between the anterior parts of the new cortex, hippocampus, amygdala and hypothalamus are mainly related to the principle of Ukhtomsky Dominance. They are the necessary and sufficient relationships to organize behaviour in the coordinate system: "needs - probability to meet them" and have important adaptive importance for organisms. The motivational influence of the hypothalamus on the new cerebral cortex has an asymmetric character, manifested both in the activation of mainly the left hemisphere and in the strengthening of the interconnections in the electrical processes in it. The amygdala complex in the brain plays a crucial role in the implementation (through its caudate nucleus) of the switching function of emotions on behaviour, in the choice of motivation. This corresponds not only to the internal need but also

to the external conditions for its satisfaction in a given situation. The prediction of the probabilities for satisfying the needs (supporting probabilities) is realized by the "information" structures of the brain - hippocampus and the frontal parts of the new cortex. In addition, the hippocampus responds to signals of unlikely events and is a key structure for the realization of the compensatory functions of emotions in the absence of information, in which the emergence of emotional tension is accompanied by different from calm behaviours. For example, the stronger the anxiety, the more often the subject responds to the neutral stimulus as aversive. The compensatory function of positive emotions is realized through the influence on the need. In a difficult situation with a low probability of reaching the goal, even a small success (increase in probability) gives birth to a positive emotion that increases the need. The frontal lobes of the new cortex orient the behaviour to signals of events with high probability. It has two functions- to extract the necessary information from memory and to organize appropriate behaviour through interactions with the premotor cortex and basal ganglia. In humans, the mental presentation of emotionally neutral events mainly activates the dorsolateral prefrontal cortex and the posterior temporal area, while in emotionally coloured scenes, the medial prefrontal cortex and the anterior temporal area are more active. The intensity of emotional tension, whether positive or negative emotions, is associated with the activity of the parietal temporal lobes of the right hemisphere. The sign of emotions (+ or -) depends on the relationship between the activities of the left (LFC) and right (RFC) frontal cortex. There are positive emotions when LFC is more active, and negative emotions are present when RFC is more active. The right hemisphere is more sensitive to emotional-negative stimuli, and is more related to the motivational sphere of the personality, and the left- to the emotionally positive and is more related to the cognitive (informational) sphere of personality. According to the Need-Information Theory, positive emotion arises when the available information is more than prognostically necessary, and negative- when the necessary information is more than the available. It can be seen that RFC is mainly related to pragmatic information needed to meet the needs, i.e. accumulated by previous experience and stored in memory, and LFC- with the information available at the time and recently acquired. Apart from the fact that the substances with psychotropic action have a direct effect on the emotional sphere, emotions are also easily susceptible to suggestogenic influences. These two sides of emotions define them as a very important and affordable tool for harmless influence on the behaviour and for inducing and managing ASC. This is supported by the brain systems for self-stimulation through pleasures, especially in combination with certain doses of appropriately selected phytopreparations. Neuroleptics and tranquilizers could be used for redirecting and reducing the resilience and strength of the existing dominant, and antidepressants and psychostimulants- in creating a new dominant, acting primarily on the reticular formation, limbic system and hypothalamic region, avoiding the use of harmful psychomimetics. Empirically, this was used in ancient times in religious and cultic rites through "smoking" plants (such as Frankincense), smoldering on charcoal or evaporating from a special vessel resins, juices and water decoctions of them.

According to David Hawkins, we as humans live on quite different levels of consciousness. All of them can be checked by muscle testing on the logarithmic scale and classified into 18 levels [13]. Aerial toll houses in Orthodoxy are also described as 18 levels of change in consciousness until transformation [14]. Levels of consciousness have also been studied in Indian culture since antiquity, grouped into four groups by quantitative characteristics [15]. An objective method for recording brain activity and indirectly consciousness is the electroencephalogram, which also groups four levels of functioning. The activity of beta, alpha, theta and delta brain bioelectric brain waves is measured, which characterize the respective levels of the brain. At alpha and theta levels, ASC occur. The beta level determines our normal waking consciousness. At alpha level, brain activity is active and leads to enhanced creative and intuitive capabilities. The high level of delta waves correlates with powerful spiritual

experiences. Their large amplitudes and the energy they carry bind to the molecules of serotonin, dopamine, anandamide and oxytocin. Theta waves with high amplitudes are associated with the healing experience and actions of the healer first, and then the healing, in which the healer feels that his hands are warming- a subjective feeling of energy flow. The advantages of the alpha state are: enhanced creativity and imagination, problem solving and troubleshooting; less stress; increased intuition; facilitated application of personality changes; expanding research capabilities; training and storage of data in memory; improving comprehension and negotiation skills; receiving new mental information; establishing a non-localized attitude; achieving the goal through visualization; independent brainstorming and concept testing; achieving maximum productivity.

Purpose

To give a brief description of the altered states of consciousness as a psychophysiological and psychological phenomenon. To prove free choice as a valid center of the psyche within the Spiral Theory of the Human Body. To systematize the possibility for targeted and harmless creation and use of ASC as a means of adaptation.

Materials and methods

The materials are modern scientific publications on the subject. The methodology is a heuristic formation of the goal, the subsequent systematization, through system thinking and testing within the holistic approach, upgrading the bio-psycho-social system method and allowing integration after the differentiation of knowledge, which is an objective need not to get lost. In the large amount of available information.

Results

The synergy of many years of anatomical, pharmaceutical, anesthesiological, psychological and psychiatric experience led to a monograph by Lyubomir Pirovski (2021) [16], which describes in detail the psycho-pharmacology of altered states of consciousness and offers a model of consciousness that finds useful use of the ASC for personality development. Based on it, a brief description of the altered states of consciousness as a psychophysiological and psychological phenomenon can be given. Different people have the same categories to describe their consciousness, but different content in them. Today, human consciousness is defined as a mental phenomenon, which by forming concepts and images, and operating with them according to certain rules, creates and maintains holographic energy-informational and emotional relationships between open non-equilibrium material structures connected in a functional system with a system-forming factor- the free choice of current human needs. Human consciousness is a process in which the neural network that makes up the brain works at an optimal level of complexity and connectivity. This allows for easy "travel of information from one place to another" and "defines consciousness as the ability of the brain to model the world around us for our survival" [17, 18, 19]. In our opinion, the basis of the understanding of human consciousness is its consideration as a dynamic, self-organizing, dissipative (according to synergetics) system and active reaction environment, whose bifurcation point (i.e. the point of unstable equilibrium) is significant for the organization of mental act. The structural and functional basis of consciousness is our formulation of the "Modular Neurosynaptic Network" integrated into the layered architectural brain complexes, and in which the processes of processing and using information to form decisions follow the spiral branches of "Dynamic Energy Information Flow". In order to change the human consciousness (including the achievement of ASC while preserving human dignity) the impact must focus on the symbolic organization of sensory stimuli associated with the human value system, and in the sign-organized psychophysiological and neural structures, characteristic of the Ukhtomsky

Dominance, the Reticular Formation, the Limbic System, and the Claustrum and Cingulum, which are the main modules of the "Modular Neurosynaptic Network". Additional tools for this are the brain systems for self-stimulation through pleasures, especially in combination with certain doses of appropriately selected psychopharmacological drugs (e.g. neuroleptics and tranquilizers to redirect and reduce the resilience and strength of the existing Dominant and antidepressants, psychostimulants and psychomimetics for creating a new one). The use of drugs is a priority of medicine and aims to preserve or restore health.

Altered states of consciousness (ASC) as a narrow psycho-physiological term are: significant deviations from the ordinary state of consciousness in the functioning of the psyche, which are identified either subjectively by the individual (verbal contact) or objectively (encephalography, functional magnetic resonance imaging), and are rapidly transient and return to normal without residual pathological effects. The various elements of the human body and psyche can be used for initial effects to induce ASC. Any psycho-physiological sphere can be affected by ASC, regardless of the initial triggering factor or place of influence. The literature indicates the most common correlations between the provoking factor, the place of initial influence and the subsequent change in the psyche, but the individual reaction builds on stereotypes. According to the scope of consciousness, two types of ASC are distinguished- by narrowing or expanding the field of consciousness.

Table 1. Classification of ASC by cause

According to the way of induction, psychological ASC are grouped as *pharmacogenic* (induced as a result of the use of psychoactive drugs), *exogenous* states (arising under extreme external conditions, which include the mechanisms of adaptation and maladaptation), *suggestogenic* (arising from suggestion and self-suggestion, hypnosis, autohypnosis, meditation, prayer).

Regardless of who is the leading cause and the natural physiological basis, ASC is accompanied by changes in perceptions, thinking and psycho-physical capabilities of man within certain limits. Signs of ASC or transition to them are changes in: 1. Psychomotor skills: behaviour, facial expressions and verbal contact 2. Consciousness: orientation and auto mental orientation and self-awareness (for the mind and body), increased suggestibility 3. Attention: active, passive, switchability and plasticity 4. Instincts 5. Perceptual activity (increased imagery) 6. Will 7. Thinking: concepts, judgments, inferences (value systems) 8. Memory 9. Emotions 10. Intelligence, which are affected in isolation or in various combinations.

A group of *pharmacogenic* ASC are the inductive states of consciousness caused by some hallucinogenic drugs (psychedelics). Unlike other drugs, they act specifically by removing the blockage on information flows and increase emotional reactivity. As a result, intense hallucinations and other interesting phenomena occur. Such herbal remedies are mostly from the group of psychomimetics. The use of these substances for pharmacological adjustment through neurotransmitters is temporary, harmful and leads to drug addiction. With their long-term use, in order to obtain the desired effect, constantly increasing doses are needed and the normal balance of neurotransmitters in the brain is disturbed. At the same time, the new unbalanced state must be artificially maintained, as it is already needed at the cellular and mental level. According to Neuroplastic Theory, however, the formation of the emotional background is not determined by the level of individual neurotransmitters, but is formed as a result of the joint activity of different parts of the brain. The interaction of these neuronal complexes is regulated by: long-term potency (sustained enhancement of synaptic transmission between information neurons); from synaptic plasticity (changes in the strength of interneuronal transmission of information) and from excitotoxicity (from damage and death of nerve endings upon over-activation of glutamate receptors). Constantly disturbed balance is one of the reason

why drug addictions lead to unhappiness. This today these substances are automatically excludes as a means of creating ASC and put under the control of the law.

Suggestogenic ASC. In the process of creating ASC, suggestion and self-suggestion are also effective tools. Suggestion (suggestion; sensory imagination) is a form of mental reflection, a method for direct connection of unconscious mental activity with the environment, in which a special attitude towards unfolding the functional reserves of the human psyche is created, mainly through unconscious mental activity. Self-suggestion is a conscious process of purposeful conscious management of one's actions. There is no fundamental difference in the physiological nature of suggestion and self-suggestion. Self-suggestion and self-hypnosis are the basis of Autogenic training, a main training method for achieving ASC. It is an active method for psychotherapy, psycho-prophylaxis and psycho-hygiene, aimed at restoring the dynamic balance in the body's systems for homeostatic self-regulation, disturbed by stressors. Hypnosis is a behaviourally sleep-like, non-sleep-related condition. The report is a connection with the external environment ("watchtower"), allowing the most complex mental activity without waking up. Unloading consciousness through peace of mind allows to achieve alpha- and teta- rhythmic synchronization of nerve cells in the frontal cortex, and supports the ability to think figuratively (and at the same time exclusively this thinking), which allows access to subconscious layers of the brain. Awareness is a type of meditation that involves focusing on realizing the present moment. It does not provide an algorithm for action, but relies on one to determine itself from a clear understanding of the situation. You can combine Awareness meditation with hypnosis in one session to more successfully overcome anxiety and reduce stress. Meditation is a very broad concept, which first of all includes mental action, a special kind of concentration, which makes it possible to create such a muscle tone in which the vital energy moves at maximum speed. In a state of meditation against the background of general relaxation, the habitual complex of body-muscle sensations related to one or another posture is disturbed. The distribution in different muscles and the regulation of muscle tone is carried out through a system of reflex reactions with the help of nerve impulses carrying information from the muscles and joints to the brain and vice versa. During meditation, the muscles are relaxed, and the information entering the brain is unfamiliar and incomprehensible. This creates a feeling of existence as if outside your physical body. Against the background of general relaxation, chronically contracted muscles also relax. Removing the barriers to the flow of life energy (biochemical and electrical), results in acceleration and normalization of the work of the nervous system. At the same time, consciousness is not excluded, as in some types of trance, but on the contrary - it becomes more enlightened and saturated. Maintaining a connection with the world around us is a prerequisite for any meditation. Thus meditation is a special "detachment". If we meditate with our eyes closed, we hear everything without effort for listen; if we meditate with our eyes open, we see without effort for staring. The main task of meditation is to get rid of side thoughts. The regulation of respiration and its control cause a particularly protective retention state in the cerebral cortex. At the same time, a state of special calm occurs, i.e. state of meditation. The way to achieve this is through contemplation of inner feelings, thoughts and emotions. The most important step towards Qi`Gong meditation is practicing and constantly using the so-called "Germinal" or "Buddhist" breathing, i.e. "lower diaphragmatic breathing". It generates a powerful energy flow, against the background of bodily immobility (static) or when performing a formal complex of movements (dynamic). Because of the meditative-breathing exercises, vibrations can be felt in the lower abdomen, which means that a new type of energy circulation has started. Concentration and calmness at this time are very important. The tip of the tongue should touch the palate in the oral cavity, and more specifically between the upper front teeth and gums to close the morphological energy circle. The tongue should be relaxed, resting on the center of the palate and not resting on the teeth. If the tongue is tense, it leads to blockage of sensation. If the bonding is good, saliva is released during

meditation and swallowed. In the process of meditation, bioelectrical changes occur in the brain cells, the electromagnetic biofield of the human body is amplified. Direct contact is made between the cortex and the subcortex of the brain. By regulating the autonomic nervous system and lymphatic system, the biochemical processes in the whole human body are activated and normalized.

Another subgroup of suggestogenic ASC is the "ritual trance" in prayers, religious rites in shamanism, mysteries, ritual dances, and the crowd effect. The theory of this type was formulated by Bekhterev and is based on the principle of Dominance and the effects on neurotransmitters. Especially in combination with rhythmic music and lighting (for example in disco clubs), which also stimulates the instincts and increases the emotional inductance and suggestibility of each individual in the crowd, allowing the human mass to act as a single organism. While meditation can achieve clarity and adaptability to follow a change in the situation, it does not allow us to change it purposefully. Trance, on the other hand, leaves room for purposeful change of personality by another person and loss of control.

Usually the initial stages of integration of neural complexes and networks is provided by a *narrowed states of consciousness*. With narrowed consciousness, there is a *selective* increase in the activity of the functional organs of the brain to excessive or beyond extreme arousal, which causes retention. First of all, the Ukhtomsky's Dominant sums up the arousal processes and the most energy-intensive complexes are suppressed. In the normal state, the force of the excitatory processes is not enough to suppress the negative displaced dominants. As a result of this process, the displaced psychic material becomes more accessible for conscious processing. Narrow states of consciousness are accompanied by intense mental activity, or work that requires great concentration. Narrowing of the visual field, the so-called "tunnel vision" is a characteristic feature of the ability to consciously provoke a narrowed state of consciousness by focusing on the problem to be solved. The narrowed state of consciousness helps to understand more deeply and to rethink as much as possible both mental and somatic problems. The magnifying glass-like tunnel helps to focus attention on certain areas of the mind and subconscious that no memory barriers or information barriers can withstand. In its transformative power, this catharsis-like process is superior to psychoanalysis. Another feature is the "Hypermnesia effect", as a result of which any past events could be recalled with great accuracy. Narrowed states of consciousness are associated with most parapsychological phenomena, as well as the conscious management of the autonomic nervous system, i.e. control over processes that are difficult to consciously regulate, as breathing, termo regulation and hart rate.

Expanded consciousness is usually provided by increasing the *overall* activity of the cerebral cortex and synchronization in the work of its various parts. Maximum synchronization can cause the expansion of consciousness even against the background of the suppressed cortex, as the cortex is only one of the modules in the network. As a result of the resonance, visible on the encephalogram, the amplitude of the electromagnetic oscillations increases. Extended ASC on subjective sensations can include both states of over- awakeness and inspiration, as well as transpersonal experiences in deep trance with extensive suppression of brain activity. Such extensive suppression of the activity of the cerebral cortex, aimed at optimizing the work of the brain or the whole organism, by creating foci of hyper excitability, could be done by hypnosis and various types of meditation, to alleviate the suggestion or self-suggestion.

In both cases, the result of the action of ASC is redistribution and the formation of new functional connections between neurons, which leads to the balancing of the processes of excitation and retention in different parts of the brain, i.e. the elimination of distress. *In many ASC there is a massive release of neurohormones and neurotransmitters.* Their ratio and quantity are dictated by internal conditions and needs, which is why they act more gently and expediently than psychopharmacological substances imported from outside. The existing balance (the set models of functioning) are subjected to a test, as the maladaptive ones can be

destroyed and a physiological minimum is reached, which is the starting point for building a new balance. Against the background of this process, it becomes possible to suppress (subordinate) the negative dominants of more general programs. *The use of these properties of the narrowed and expanded altered states of consciousness, through their planned gradual and controlled sequential alternation is an optimal technology for successfully solving various problems, situations and tasks of human behaviour and activity, without harmful consequences for the human body.*

Heuristic processes are an example of the use of this technology. In human mental systems, they encompass creative thinking (analytical, deductive, logical and / or intuitive, associative, unconscious, convergent or divergent), which is in all cases an original, new and proactive (discover, poses and solves new problems and different solutions). Characteristic of creative thinking, i.e. the combination of initially narrowed altered consciousness, followed by expanded altered consciousness, in posing and solving a problem, is the use (consciously or subconsciously) of the properties of Ukhtomsky's Dominance. Creative personalities, as a rule, have divergent thinking - they seek a solution to the problem in all possible directions, forming connections between elements that seem to have nothing in common. The motivational dominant, formed by an event indifferent to other people, determines the productivity of the creative process. The creative intuition (super consciousness) always "works" to meet the ideal needs for knowledge and environmental transformation, consistently dominating the hierarchy of motives in a creative personality. The neurophysiological basis of intuition from modern positions is the unconscious transformation and recombination of trace information (engrams) from previous experience, and its emotional evaluation orientation. Intuition is triggered and guided by the dominant need, in order to find resources for its satisfaction. Consciousness develops the problem horizontally, operating with words and numbers, while penetrating the unknown is vertical and. As a rule, the new idea (poetry, painting, etc.) is born in the subconscious, operating with symbols and images. The subconscious is more connected with vital needs, with intuitive behavior, especially in extreme situations. Consciousness is involved only in the formulation of the problem and logical and experimental verification of the intuitive (superconscious) hypothesis. This is the most powerful and genetically fixed adaptive system of the brain. In the narrowed consciousness the displaced psychic material becomes more accessible for conscious processing, and in the subsequent expanded consciousness it becomes easier to suppress or subdue the negative dominants to more general programs. Reassess the existing dominance, followed by creating a new one, associated with the redistribution and formation of new functional connections between neurons, leads to balance of the processes of excitation and retention in different parts of the brain. ASC can be arranged hierarchically, according to the system- forming factor, which is the presence of choice and control. It is most strongly lost in pharmacological response, secondly in exogenously induced conditions and thirdly in suggestogenic conditions. The same classification is also valid for the biochemical and psychophysiological changes. This defines the suggestogenic and auto-directed ones as the leading choice for main provoking factor, and the others as additional ones. A comparison of the safety practice we can grade them- 1. physiological ASC (sleep, lucid dreaming, insomnia), diet, phytotherapy 2. Pharmacotherapy, suggestion, extreme situations 3. Meditation, prayer and fasting. As an efficiency in terms of complex engagement, most modules of the "Modular Neurosynaptic Network" are arranged in the same way, except that prayer is more engaging than meditation and while religious trance aims to create and maintain AS, the Heart prayer aims at a new normal state of consciousness beyond ASC by acquiring new personal qualities permanently. While pharmacogenic and exogenous factors do not have the potential to purposefully change the personality, the suggestive ASC have just such a goal. Another major difference between meditation and prayer is that the meditation seeks the "truth", while the prayer, after consciously choosing a personality type as a model, aims to establish it, in full

consciousness and control. Intuition is the main tool in meditation, while the conscience (value system) is the main tool in prayer. Therefore, they are separated into different groups of states of consciousness. Reaching the center of the human personality- its free choice, while maintaining it is possible only with suggestogenic ASC. The quantitative and qualitative characteristics of consciousness are interrelated and only with a healthy nervous system and a holistic model of consciousness is it possible to achieve full realization of man.

Table 2. Advantages and disadvantages of ASC

Individual personal development is very variable and the appropriate initial intervention can vary within all listed ASC both in the way of provoking it and the desired effect. The hierarchy in the provoking factors is always preserved, as well as the principle of successive transition through the normal-narrow-extended-new normal state. The development of the personality can be measured by 1. the actual need which is chosen for influence, by the pyramid of instincts 2. the activity of a person, and 3. the successful practical realization. These three factors determine the predominant role of controlling current needs, over their immediate satisfaction, which is in line with new data on "rosehip neurons", as cells with retention function on a large part (2/3) of the neural population of the cortex of the brain, as well as with the religious practice of "fasting."

The Spiral Theory of the Human Body defines free choice as the center of the human system and describes it as a type of personality. Every effort leading to an extreme state, no matter what personality traits we have tried to acquire, is wrong, due to interruption or limitation of the possibility of choice and control in the future. The only model that reinforces adaptation is one that reproduces free choice again, as it alone gives freedom to deal with new situations. This defines Free Choice as the center of man, as well as a system-forming factor of the “Modular Neurosynaptic Network” and the resulting consciousness. Like the imaginary spatial grid described by Jeff Hawkins, in The Modular Neurosynaptic Network, we propose an imaginary personality grid of all the possible personalities that one person can develop.

Fig. 1 Scheme of targeted and harmless creation and use of ASC as a means of adaptation. With the red arrows are the states leading to narrowing of consciousness, and with green - expansion. The circular movement of systems leads to their balancing and construction, while the change of scale by passing through the center leads to qualitative changes and new functions. The first transition (1) is from the center 0 to the creation of a body and takes place at conception. The second (2) is in the formation of the psyche as a derivative of nervous activity. The third transition (3) is in building a personality based on normal mental activity (interests, philosophy, worldview, ethics, knowledge, habits).

In initial normal consciousness must adapt to constant changes - stress (stimulus). Exhaustion of adaptive capabilities leads to distress (decompensation). Compensation can be with physiological ASC. Wrong adaptation leads to chronic distress and pathological compensation (illusions, bad habits, self-deception). Recovery can be accomplished only by selecting target for harmless, induced and controlled ASC in a cycle (normal-narrowed-extended-new normal state, alternating left and right hemispheres). Restoring normal consciousness is recognized by good adaptation to constant change and maintaining the possibility of free choice. Understanding this technology for influencing consciousness is important both in terms of the independent work that a person performs for the creation, development and transformation of his own personality, and for the process of education. On the other hand, it allows for the prevention and treatment of pathological personality patterns imposed by external factors.

Conclusions

Altered states of consciousness have their place in the normal psychology of man. It is especially important to study modern knowledge of ASC as a means of achieving programmed success, and as an antidote to the use of misinformation for external control over the consciousness, behaviour and actions of the individual, the crowd or the society. The cyclical use of narrowed and expanded altered consciousness, in their successive alternation to achieve a balanced cycle, are the optimal psychophysiological means and controllable action to achieve success in various situations without harmful consequences for the human body. Limiting the understanding of man only at the level of consciousness leads to a vicious circle that could be broken by changing the scale of functioning and upgrading the simple perceptual-representative and instinctive activity with complex adaptive personality response. Changes in consciousness provide an opportunity to learn more about it as a human tool for achievement of personal understanding and motivation of free choice. Moreover, the human person as an object and as a subject can become an innovative product. What type of person everyone chooses to be determines his or her pattern of adaptation and behaviour.

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Table 1. Classification of ASC by cause				
type:	*Pharmacogenic*	*suggestogenic*	*exogenous*	*Natural*
examples:	Neuroleptics	suggestion	temperature	A dream
	benzodiazepines	self-suggestion	hunger	Diet
	hallucinogens	hypnosis	thirst	Age
	hormonal preparations	self-hypnosis	illumination	daily rhythm
	antidepressants	meditation	sound	physical activity
	thymostabilizers	NLP	trauma	Fragrances
	Alcohol	prayer	infection	Combined

Table 2. Advantages and disadvantages of ASC			
ASC	Advantages	Disadvantages	Conclusion
physiological (sleep)	natural mechanism, harmless	lack of control, weak and unclear awareness	Automated
pharmacogenic	powerful biochemical action	dependencies, difficult dosing	for treatment only
Exogenous	powerful physiological action	difficult control, life threatening	limited use
suggestogenic	harmless	slow and weak	long-term application
Suggestion	lost of one's own personality	interference by another person	short-lived, lack of awareness
self-suggestion	independence	lack of corrective	weak control
Hypnosis	circumventing one's own personality	interference by another person	lack of control and awareness
self-hypnosis	independence	lack of corrective	lack of awareness and control in adaptation
Meditation	independence, clarification of choice	there is no standard for choice	good preparatory practice
holistic method for ASC	combined approach, harmless, purposeful	medical competence and competence in pharmacology and phytotherapy, practical knowledge of neuro anatomy,	Specialized assistance for psychiatric and psychological assistance, preparatory stage for personal development

		psychophysiology and holistic method	
Trans	group activity	interference of another person, lack of control and awareness	to be avoided
Prayer	individual affirmation of free choice according to independently chosen standard, group practice, presence of corrective, upgrading of psychology	difficult awareness, innate desire to deviate from the standard, mainly psychologically oriented	individual and group practice with full commitment of personality and behaviour. It needs to be combined with physiological methods of adaptation.

Fig. 1 Scheme of targeted and harmless creation and use of ASC as a means of adaptation