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Klinická psychologie a osobnost. 2013, vol. 2, iss. 1, pp. 91-100

ISSN 1805-6393 (print); ISSN 2336-4432 (online)

Stable URL (handle): https://hdl.handle.net/11222.digilib/129484
Access Date: 22. 02. 2024
Version: 20220831

Psychical Phenomenon of Personality in Clinical Practice

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Abstract

The name of the professional magazine, in which we are publishing this slightly polemic study, is for us a preamble which determines its intent. By means of the content of the article we open the discussion about **personality**, since existing models and theories of personality bear witness to the construct of personality and "conceptual chaos and semantic confusion" rather than to the extent of cognition of real psychical phenomenon.

Presented study simultaneously includes also preparatory methodological notes to the extensive research whose main goal is to confirm or reject the hypothesis that human psyche is a specific quantum phenomenon (C-phenomenon) with entirely specific configuration of quantum waves, since by definition it is a self-organizing, self-regulating and self-realizing living dynamic system (with the core of personality, which is "I") on macroscopic level. Its specificity consists in the fact that it is just a self-containing and self-realizing phenomenon which as such is in case of need able to rotate neuronal activity of the structures of the living central nervous system by 180 degrees. It is becoming apparent that brain is plastic (it is a competitive plasticity) not only in so called sensitive periods of its development, but for the whole time of human existence.

Key words

human psyche as a specific quantum phenomenon (C-phenomenon), connectivity of psychical and neurophysiological phenomena, connectivity of neuronal structures of central nervous system and of personality, neuronal complexity, neuroplasticity

Abstrakt

Název odborného časopisu, ve kterém uveřejňujeme tuto mírně polemickou studii, je pro nás preambule, která stanovuje jeho záměr. Obsahem článku otevíráme diskusi k tématu **osobnost**, vzhledem k tomu, že stávající modely a teorie osobnosti vypovídají spíše o konstruktu osobnosti a „pojmovém chaosu a sémantické zmatenosti", než o stupni poznání reálného psychického fenoménu.

Předkládaná studie současně zahrnuje i předběžné metodické sdělení k rozsáhlému výzkumu, jehož hlavním cílem je potvrdit nebo zamítnout hypotézu, že lidská psychika je specifický kvantový fenomén (C-fenomén) se zcela specifickou konfigurací kvantových vln, neboť je ze své podstaty samoorganizujícím, seberegulujícím a sebe si uvědomujícím živým dynamickým systémem (s jádrem osobnosti, kterým je já) na makroskopické úrovni. Specifičnost spočívá ve skutečnosti, že se jedná právě o sebepojímající a o sebeuvědomující fenomén, který sám o sobě dokáže v případě potřeby o 180° obrátit neuronovou aktivitu struktur živého CNS. Ukazuje se, že mozek je plastický (jedná o kompetitivní plasticitu) nejen v tzv. senzitivních obdobích jeho vývoje, nýbrž po celou dobu existence člověka.

Klíčová slova
lidská psychika jako specifický kvantový fenomén (C-fenomén), osobnost, já, konektivita psychických a neurofyziologických fenoménů, konektivita neuronových struktur CNS a osobnosti, neuronová komplexita, neuroplasticita

Introduction

This theoretical paper simultaneously includes also preparatory methodological notes to the extensive research whose main goal is to confirm or reject the hypothesis that human psyche is a quantum phenomenon (C-phenomenon) with entirely specific configuration of quantum waves since, in view of the fact that, by definition, it is a self-organizing, self-regulating and self-realizing living dynamic system on macroscopic level. Its specificity consists of the fact that it is just a self-containing and self-realizing phenomenon which as such is in case of need able to rotate neuronal activity of the structures of the living central nervous system, which is at the same time its carrier, by 180 degrees. Such a complicated phenomenon as human psyche requires both a new theoretical framework for its analysis and extension of existing clinical application area. In this theoretical paper, for the time being, we are not going to elaborately deal with the work of Fröhlich (1970, 1975), Deutche (1985), Glynn (1990), Hameroff (1982, 1990), Haag (1992), Beck & Eccles (1992), Atmanspacher (2004) and many others whose studies represent solution and theoretical base for own conception of psychical phenomenon as a specific quantum phenomenon. For illustration we will mention only a few reflections for example of Fröhlich who organically incorporated also the conception of Bos-Einstein (in Paige & Matthews, 2011) into his theoretical reflections. The impulse for looking for the answer to the question how the quantum phenomenon could demonstrate itself on macroscopic level in a living brain emerges from his reflections. Besides other things, Fröhlich came to the conclusion that during conformational transitions (it is a molecular dynamics) there is a change of many protein functions such as signal transitions, opening or closing ionic channels and other functions and all of this happen within picoseconds. Quantum coherent states of proteins consist of quantum superposition of two mutually different conformational states. Under certain conditions there is a delocalized state of an electron in the hydrophobic area of protein and at the same time a delocalized state of protein conformations. Individual proteins have then the chance to become the part of one quantum state at the given space-time moment.

At this stage of reflections we must also briefly mention the structures which are qualified for becoming the bearers of such a specific quantum phenomenon. These structures are microtubules in cytoskeleton which are in the shape of tubes consisting of one layer of dimeric subunits of molecules alpha and beta of tubulin dimmers (Hameroff et al., 1982, 1990). Microtubules permanently polymerize and depolymerize, form together with associated proteins (MAP – microtubules associated protein) extensive networks and they influence cell shape and functions and also synaptic connection of neurons. Cell architecture and synaptic connections can be quickly changed by microtubular conversion. A lot of organized cytoskeleton functions are realized by MAP activity. Some MAPs (for example kinesin) act as motors and they transfer material among microtubules. A lot

of research point out the connection between cytoskeleton and cognitive functions (for example reduced cognitive performance correlates with the loss of dendritic MAP–2). Microtubular dysfunctions are proved also as far as Alzheimer's disease is concerned. The influence of cytoskeleton informational system on signal transmission and processes of information processing is scientifically proved. It manifests itself through conformational formulas of tubulin dimmers inside microtubules which are the representatives of information. These conformational formulas of tubulin dimmers state behave like cellular machines and they represent informational processes in cells including regulation of synaptic connections of neurons. Quantum state of the brain at a given time and space depends on the number of tubulin dimmers which take part in the quantum state and so in the number of neurons, which are interconnected by dynamic interactive network which constantly processes information from external and internal environment at every moment, cooperating on transfer of information at a given time. Quantum state is thus constantly influenced by information flow generating from interactions (mutual interaction) of external and internal environment and by changes of these interactions. This interaction change is a stimulator of this dynamics. But the interactions mean influence among phenomena which interfere with each other. Therefore it is not a causal effect. At the same time, it is very important that complex psychical phenomena and complex neurophysiological processes are connected by quantum dynamics and they form quantum compactness independently of time and distance in the area of neuronal networks. Otherwise, the existence of for example steady psychical phenomena consistent in time, such as **I**, representing the core of personality or compact shows of complicated behavior steady in time and space, would not be possible. Psychical phenomena do not intentionally manifest themselves as sum of individual brain functions but as phenomena as such. However, there is the whole included in each of them at the same time ("this is happening to me", "I am reading", "I am writing this theoretical paper" etc.).

The analysis of mechanisms and rules, which are involved in securing a complex and real psychical phenomenon steady in time and space manifesting itself in wholeness, which is a personality, represents the chance of research development in knowledge about human psyche. This chance is not provided by examining only the partial psychical phenomena, such as research focused on cognitive performance, executive functions, emotionality etc. Not only that we do not have the instruments enabling the study of these phenomena, which are of non-linear character, but we do not have the instruments for the analysis of the changes in interfunctional connections between psychical phenomena and their impact on the wholeness, which is not a mere sum of interacting psychical phenomena, but it is a new quality manifesting itself for example in consciousness content. Basically, it is a specific configuration of information in quantum field. This configuration is undemanding in terms of energy (provided they are in curled form) and exceeds the boundaries of space-time of material world. These configurations of information, which are of quantum structures character, exist shortly in uncurled form in content of consciousness (in that case, they claim the energy, which manifests itself also in energetic activity of relevant working constellations of neurons), otherwise they are present in a latent form in a curled form. Just for illustration it will be enough to realize for example how the pictures, images and data about past events often mingle in the consciousness content, how they interact with the contemporarily perceived reality, while steady personality phenomenon consistent in time with "**I**" as the core of

personality always enter into this action and decide about the interactions of quantum structures. **I**, besides other things, has an integrative function in quantum field and even organizes the formation of such an information configuration, where information with character of past, present and future quantum structures interconnect. We would like to remind you again that also the whole is present in each quantum structure at the same time. All this is possible only in a quantum field. It is the only way to explain that bioelectrochemical processes taking place in the brain generate, by definition, psychical phenomena, but it is not the same. Psychical phenomena are real as well as the bioelectrical and biochemical phenomena are. Contemporary diagnostic methods, both neuropsychological test batteries and imaging techniques fMR, PET, SPECT etc., are not able to measure and evaluate potential of consciousness only on the basis of progressive evaluation of simultaneously acting processes, because the whole does not behave as the sum of activities of individual consciousness subsystems of consciousness, although these subsystems follow the same interactive and space-time principles as the consciousness in the wholeness do.

The same thing applies to personality. But as far as the personality is concerned, it is a paradox, where the potential of individual subsystems of personality is judged on the basis of the quality of (behavioral) outcomes of the whole. In that case it is not possible to point to causes of differences in individual subsystems and thus to draw causal conclusion that these differences are the cause of the differences in the behavior of the whole. We must become aware of the fact that resulting behavior in a certain moment and in a certain context is only the result variant from many other probability variants under consideration. This resulting variant does not have to be the variant which we causally expected at all. People themselves can narrow the framework of their thinking, use the potential of their consciousness to a limited extent, when they consider the resulting variant to be the only logically possible variant and forget the lateral thinking (see De Bono, 1971). Human psyche is constantly changing in time in permanent interactions with external and internal environment and therefore it does not show identical outcomes in time, because it is not a servomechanism, but it is a living (not mechanical) human being. If we want to come closer to the nature of human psyche, we must diagnose its interactive dynamics (short-term versus long-term, quick versus slow etc.). On neuroscientifical level it means, besides other things, to focus on changes in energy, bioelectrical and biochemical background of interactive processes, on measuring differences in speed that these processes run at in case of the changes in interactions, on specific changes of neuronal complexity, on morphological changes in those working constellations of neurons, where the changes take place. On neuropsychological level it means to diagnose the changes in behavioral demonstrations with their neuronal connectivity.

However, human brain "paid for" the fact that it generates, by definition, human psyche, because it runs on different principle. But human psyche is not content with uncertainty, chaos, "disorder", but it strives for set of rules. Although the premises are sometimes incorrect, in an extreme situation it rather accepts following pseudological unit based on them, in order to decrease psychical strain and higher energy output. The fascinating fact about human psyche is that "**I**", as the core of personality, has the "key" for getting human psyche from fixed schemes in order not to stagnate. Human mind, **I** as the core of personality, by means of this "key" decides as a result also on behalf of brain about the direction of further development. The key is the ability to ask questions,

original thinking, creativity, intuition, desire to discover something new, will, ability to predict and self-overlap. This all enables **I** to decide in case of unclear and open situations to set itself a target corresponding to the motive on the basis of updated motive for the new solution. A man heads towards finding out the new and unusual solution of the old problem while preserving meaningfulness of such a procedure. This will open the way for processes, which in accordance with brain neuroplasticity simultaneously lead to the change on synaptic, modular and multimodular level in neuronal networks, mainly in those which are connected to prefrontal cerebral cortex. Structural and functional change is influenced also by ability of so called lateral thinking (see de Bono, 1971). In this context it is necessary to pay higher attention to the fact that brain structure in early childhood influences also prevailing positive emotional background (Trevarthen, 1990). However, positive emotional background, disposable optimism (Carver & Scheier, 2002) have a positive effect on the degree of brain neuroplasticity while getting new experience and new knowledge and also on their use for all further life of a man.

We stated that when "**I**" decides about "**I**", it is not the matter of bioelectrical and biochemical changes, but it is initiating of the changes in brain on the part of "**I**". Bioelectrical activity and biochemical processes are necessary for realization of decision of "**I**" in material environment, which surrounds people. It is fascinating in this context that on material level we need to have two devices, two mechanisms, which are related to each other. That is the mechanism securing the thinking about oneself ("I think that...") and mechanism which secures self-awareness – "**I**" ("it is happening to me") – at every moment. The first psychical phenomenon is the product of mental activity, thinking about oneself. It is the thought about itself tied to "**I**", such as "**I** am a genius". The second psychical phenomenon is the immanent part of consciousness, self-awareness, in other words projection of "**I**" into the consciousness content and he/she is the one who he/she really was before he/she starts "hiding" himself/herself behind various masks in different roles. How can we explain this fact only in the context of neurophysiology and biological sciences?

When neuropsychologists start dealing with personality issues, they ask themselves, where the structure of personality (bigger than 4–dimensional) is "spread" in 4–dimensional biological space. It is not reviving of localizationistic or non-localizationistic tendencies in neurosciences, but it is the effort to find the way to the nature of this really existing phenomenon. Unlike neurologists and neurophysiologists we are not convinced about the fact that the optimal way is through pathology. It is true that lesion in some parts of working constellations of neurons leads to the change of consciousness quality (but it does not concern selfhood, "**I**" phenomenon), to disorders of interfunctional connections among psychical phenomena etc. It is obvious that also during such serious illnesses, such as akinetic mutism, locked-in syndrome, self-awareness is preserved. The same significant fact is that, for example, the extreme hydrocephalic syndrome does not impede self-awareness, "**I**" phenomenon, functioning of personality. Even more remarkable fact is that, for example, the split brain syndrome does not form "two personalities" in one brain and that self-awareness, selfhood, compact "**I**" is preserved again.

We came to the same conclusion also while evaluating the consequences of precisely localized damages in various cortical areas. If we use, for example, for finding out the extent of functional faults, when lesion occurs in the area of left dorsolateral prefrontal cortex, the Wisconsin test or for example Continuous Performance Test for mapping the

changes in quality of functions, when reversible lesions of medial prefrontal cortex occur, than in neither case we will find out the disorder of self-awareness, disintegration of "I", but we will find out serious defects of other psychical phenomena. There are many questions, for instance:

1. What enables in a biological space of human brain during development to arrange and then keep stable, compact personality continual in time and stable psychical phenomenon "**I**", which is characterized by such a level of integrity, that its potential change would be a sign of man extinction (as opposed to the changes in personality structure)?
2. How come that this "**I**" (which has at the same time strong integrative function) generates, by definition, the meaning of human existence of a particular man, again regardless biochemical and bioelectrical processes which are highly variable in time?
3. What mechanism does the above mentioned psychical phenomenon "**I**" uses for modulating the biological meaning in the way that through this change its own intention and perspective are introduced in partial biological processes and as a result in particular behavior in material world?

What is the nature of personality? Can we say that it consists of neurons, neurotransmitters, neurohormones and spatially constituted neuronal networks, whose attributes and the way they process information, lead to the formation and existence of personality? As we stated above, the fact that the selfhood, **I** as the core of personality exists, places higher demands on formulating the answer to the question about the nature of personality. "**I**" is not a phenomenon "beside" human psyche, it is not isolated integrator, coordinator and regulator of psychical processes, but it is integrated and at the same time integrating part of the whole system. It is the exceptional phenomenon to the intent that it is located in the intersection of internal, external and spiritual world of a man. Their demands on a man must be harmonized so that it can exist in real world as a competent human being, who experiences this compactness as a meaningful existence in a meaningful real world.

It is problematic to accept the fact that biochemical and bioelectrical phenomena enable the formation of psychical phenomena, such as subjective feeling of self-respect, self-acceptance, self-confidence or even enable meditative character of such moments of existence, where "**I**" does not need words to seize own existence. "**I**" is simultaneously subject and object to itself. "**I**" has even another function and that is to prevent us from losing identity in wordless merging with own process of existence during meditation. We have not found the complete answer to the question "how is it possible" yet.

If we want to understand the connectivity of partial psychical phenomena, but mainly the personality with neuronal network, we need to turn not to cybernetic brain or virtual brain, but to the real object, the living brain as a whole. Unfortunately, existing knowledge of partial psychical functions and their neuronal connectivity do not help us much in thoughts about personality, about "**I**". It is true that prefrontal lobes and the functions connected to them play an important role in the development of personality. Prefrontal cerebral cortex is that structure, which is the bearer of so called social extension of human psyche. Empathy, flexible adjustment, ability to internalize moral values, ability to develop higher emotions and ability to connect eroticism and sexuality belong here.

Initiative, affiliative and assertive behavior, ability to predict, ask questions etc. generate from the activity of prefrontal sections of frontal lobes. However, personality phenomenon does not generate from the activity of prefrontal cortex. Mechanisms stored in prefrontal zones are not able to secure at every moment such a phenomenon – personality, "**I**"– which is characterized by strong integrity and is stable in time.

Intrapsychic space is not 4–dimensional (it is probably 11–dimensional) and it does not respect the rules of material world. On the one hand, brain enables stable and compact phenomena continuous in time, such as consciousness content, attitude, personality, to be arranged and then preserved in biological space of human brain during development and also stable physical phenomenon "**I**" continuous in time, which is characterized by such a degree of integrity that its possible change would signalize a death of a man (as opposed to the changes in personality structure). "**I**" as the core of personality, which has simultaneously also significant integrative function enables people to perceive themselves in the wholeness and experience the meaning of own existence, own being, regardless biochemical and bioelectrical processes highly changeable in time. On the other hand, other components of human psyche, substructures of its personality, cognitive function, conative function and emotionality during development and in the course of interactions with external and internal environment undergo changes. If the interactions mean mutual influence, then it practically means that human psyche gets information from external environment and at the same time it sends the information to the external environment. As a consequence of connectivity of psychical processes with relevant neuronal structures, changes in psyche bring about the changes in the speed of information transfer, changes in neuronal spatial tracks etc. Brain is characterized by neuroplasticity and as a consequence of above mentioned permanent interactions, a morphological change in those parts of its neuronal networks, where the activity predominates for a long period, can progressively occur.

It follows from the above mentioned facts that complex and compact psychical phenomena, such as consciousness, personality, from the point of view of space-time parameter behave steadily (a man has the experience of continuity), not as the set of partial subsystems entering them, to which they are not reducible. In a way they represent phenomena as such, but they enter interactions with internal and external environment through these subsystems. Behavior of the whole manifests itself in a different way than the sum of parts, which makes the whole. We do not know the integrative "power", which keeps this compact physical phenomenon in such a form from the point of view of time and space. The fact that these compact psychical phenomena are constituted by differently working input subsystems both from the point of view of time and space parameter and uniqueness of every man, is very fascinating. These subsystems differ in various forms and levels of processing the information and as a result of connectivity with neuronal networks it differs also in the speed of information transfer in this network, functionality of inhibitive and activation neurotransmitter mechanisms, in the extent of structuralization of neuronal networks etc. If it is not so, then all people would, for example, show identical displays of behavior in the same environment.

The core problem of psychological diagnosing follows from the above mentioned facts, because we have diagnostic tools which measure phenomena of linear character, but we do not have the tools which would enable us to observe phenomena of non-linear character. On the one hand, we need such techniques and methods which would simul-

taneously measure processes entering higher units and it would help us to define their potential. For example, we cannot find out the cause and degree of dissimilarities of individual psychical processes, which are involved in the result, from the cognitive performance of a man with mild cognitive impairment. On the other hand, we need such new methods, which would help us to find out the real potential of psyche of a particular person without judging him/her on the basis of particular performance of his/her psychical processes. Interdisciplinary solution of problems and using modern imaging techniques within neurosciences can be partial way out. These imaging techniques are able to record differences between healthy and damaged brain with high space-time precision, but they are not able to precisely distinguish the differences between two healthy people without brain damage. Moreover, consciousness contents, displays of behavior and experiencing happen in the contexts which are, besides other things, determined also by interactions with present environment, where a person occurs now and by his/her inner state. Spectroscopy, which measures the properties of quantum systems, can be helpful.

It is not possible to confirm or disprove the hypothesis that psychical phenomenon (which has not only non-linear character but at the same time it is multidimensional compared to material phenomena) is a specific quantum phenomenon with completely specific configuration of quantum waves in view of the fact that it is a self-organizing, self-regulating and self-realizing living dynamic system on macroscopic level within one research project. It is possible to solve such a complicated issue only transdisciplinarily and in stages where the results of one finished stage are at the same time the source of information for constituting the following stages. Within this process of research solution of basal issue of neurosciences and psychological sciences there are a lot of obstacles which we need to simultaneously process. One of them is the fact that among neuroscientists and psychologists there is only minority of those who are willing to admit and argue to the effect that the human psyche is different from everything what we have been able to discover, analyze and learn so far by means of instrumentation. We are even unsuccessful in reaching an unequivocal consensus that the psychical phenomenon and neurophysiological phenomenon are not the same thing and that it is not only a different point of view or research level of psychical functions and their connectivity with relevant configurations of working constellations of neurons. However, understanding the basic differences on the one hand and context on the other hand in case of psychical and neurophysiological functions is crucial for further research analysis of relations between brain and human psyche, brain and personality. However, it requires a radical change of existing paradigm of thinking about examined psychical and neurophysiological phenomena and formation of a new concept of scientific thinking. Otherwise we cannot understand the fact how huge amount of sensitive, sensory and motor information about each subject and reality phenomenon, about state of own body etc. is at every moment contemporarily distributed in series and in parallel through neuronal network (according to various modalities of perception) into various actual configurations of working constellations of neurons in central nervous system. We cannot understand how information flowing through simultaneously active receptive places of neurons in various structures of central nervous system interact with previous experience in order to be finally interconnected in sensed and realized continuous process, whole (consciousness content) which is perceived subjectively and with the possibility to recall it again and to

have the experience in every moment that "it is meaningfully happening to me".

The problem is that we do not know the structure within central nervous system where this synthesis of originally separated information about subjects and reality phenomena takes place. These interacting processes which take place in series and in parallel must be well-supplied in terms of energy as well. So far we have been able only to record by means of existing instrumentation the abnormalities of neuronal activity of the whole brain and related changes of parameters of neuronal complexity in connection with typical changes in behavior and experiencing of a man. But as a result **I** as the core of personality and the highest authority in hierarchical regulatory system of brain and human psyche decides about the whole. **I** decides, besides other things, about the fact which configurations of information are important and which are not. In this context it decides about connection of activation or inhibitive mechanisms in relevant receptive places of synaptic connections. Therefore perspective vision in neuropsychology, according to the beliefs of the author of this study, which is a new paradigm of scientific thinking about human psyche as a specific quantum phenomenon, must head towards marking out research strategies which will lead to revelation and understanding of mechanisms and rules which assert themselves in the structure of personality in connection with the structure of the whole brain. The main process, which contemporary psychological and neuroscientific research in particular field follow and which is lined with research projects focused on exploring only partial psychical phenomena which are approached as the phenomena of linear character, is definitely a dead end process.

The framework of the research project as a first step towards achieving the goal that is mentioned in the theoretical part

While constituting the research project itself, we relied on above mentioned facts and we chose following philosophy of the research strategy: we suppose that negative life events and emotional stress occurred more often in the childhood of people with asocial and health-threatening behavior as opposed to people with pro-social and health-supporting behavior. These differences in human psyche also manifest themselves as dissimilarities in connectivity with relevant working constellations of central nervous system and in their complexity.

The following considerations are linked to the original article in the previous issue of the scientific journal (see Vašina & Bargel, 2012).

Long-acting stressors causing the stress responses above limits can lead to abnormalities in those structures of central nervous system which have the deciding role in the responses to stress. We will mainly focus on prefrontal circuits, limbic system (so called limbic irritability) and hippocampus and cortical areas directly related to them.

Then we will focus on the analysis of the components of social and emotional intelligence and on the analysis of protective characteristics, adaptive strategy of stress management and personality disorders.

After that people put in the first research group (with pro-social behavior), people put in the second group (with asocial behavior), people put in the third group (with health-supporting behavior) and people put in the fourth group (with health-threatening behavior) will be exposed for a short time to a conflict stress situation and non-conflict stress

situation. The parameters of electrodermal activity (height of the amplitude of skin conductivity, time of electrodermal reaction, degree of total habituation, electrodermal instability etc.) will be monitored. The data acquired by both procedures will be compared to the data acquired in a resting state. The changes in dynamics of electrodermal activity signal the changes of neuronal complexity.

We have decided to carry out measurement of volume and concentration of brain matter by means of voxel-based morphometry (VBM), which is the significant parameter for finding out the differences between people with pro-social and health-supporting behavior as opposed to the people with asocial and health-threatening behavior. It is possible to use VBM without modulation and VBM with modulation for calculation of the differences in the volume and concentration of grey matter between both groups. The results are then statistic parametric maps depicting the differences. Anomalous findings acquired by imaging techniques provide us with the chance to constitute psychotherapeutic and social rehabilitation programs made to measure for particular people.

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