B R A I N - B E A T

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Preface

The cardiologist puts on the stethoscope listens to the heartbeat of the patent suffering from cardiac arrhythmia. The psychiatrist is tuning to the brain-beat of the patient suffering from personality disorder. Arrhythmia-induced cardiac insufficiency is in principle similar to mental disorders (insufficiencies) caused by disturbed brain organizations (brain arrhythmias if you will).

Today it is possible to reformulate the patient's complaints (i.e., clinical phenomenology) e.g., of a "Borderline Personality Disorder," to a neuroscientific brain disturbance using tools from physics of complex-systems and neuroalcomputation (1,2,3,4,5).

"Clinical Brain Profiling" translates phenomenology of mental disorders into their presumed neuroscientific disturbances, thus creating an ethiopathological diagnosis for psychiatry.

"The Brain-Beat" concisely explains how the brain organizes; "The Patient" describes the phenomenology of a borderline personality disordered patient. "The Clinical Brain Profiling" translates the phenomenology of the patient to clarify his neuroscientific brain disturbance, and "The Cure" points to the direction of future interventions needed to cure the patient.

This is an effort to introduce a brain-related (ethiopathological) psychiatric diagnosis instead of the currently descriptive diagnosis for mental disorders.

The brain beat

Two nodes connected by the conduction electrical cells of the heart determine the cardiac rhythm and these regulate the cardiac activity to perform its function of supplying blood to the organism.

The brain provides functions that are many times more complex than any other organ in the body, “consciousness,” “cognition,” “personality” “motivation” and “mood,” to list only some of the functions, the brain uses billions of nodes and many times more connections to achieve its functions.

The brain “beats” to an extremely complex rhythm, first it obeys to the balance of connectivity and the law of small-wordiness, this develops from the dynamics of plasticity, and evolves to the function of hierarchy and integration.

The brain learns, it incorporates experience and creates internal models of the world (6). This is done using “experience dependent plasticity” obeying Hebbian dynamics (7). Experience activates neuronal ensembles, re-experiencing strengthens the connections between the re-activated neuronal ensembles, making them representatives of that experience, thus learning is the process of plasticity inductions among neurons, and memories are the neuronal ensembles strengthened and chosen to represent the experience within the brain neuronal network organization, i.e., the resting-state basic networks forming the brain. In fact, the connectivity of the brain organizes according to the experience-dependent, ensemble-forming plasticity (5). Experience shapes our internal models of the world, this was already recognized for many years by Object Relationships psychologists (8).

The dynamic process of experience dependent plasticity never stops; the internal model keeps updating continually, in effect the brain always acts to predict the occurrences surrounding us and strives to minimize any differences that may ensue due to the changing environment in comparison to the internal model, updating it continually. This is measured as reduction of differences (free Energy) between the internal representations and the actual occurrences (9).

To allow for flexible and adaptable learning, balanced connectivity is achieved by the brain, balancing randomness and orderliness achieved by the Small-World connectivity formation, a connectivity balance between the number of nearby brain regions and the far-reaching ones (10). If this balance changes the system can become either destabilized and random or overly fixated and rigid, both alterations damaging to the regular functions of learning and reasoning. In effect, destabilization results in psychotic mental phenomena while fixation causes insufficiencies such as schizophrenia deficiency syndromes (11).

With connectivity disturbances hierarchy balance is also afflicted, if hampered, higher-level hierarchical functions such as motivations and volition maybe destroyed or conversely higher-level dominance can impose false representations to bear on sensorial assessments of reality manifesting phenomenologicaly in the form of delusions (11, 12).

For higher mental functions, the involvement of the whole of the brain is required, because high mental functions such as consciousness awareness and feelings, are emergent properties of the entire brain (3). No single part of the brain alone, be it one neuron or even brain regions, can be integrative enough to manifest such high-level emergent properties. Thus, the main purpose of connectivity and hierarchy is to mobilize the brain as a one whole integrated systems (3).

if whole brain organization should keep its integrity in a rapidly changing fluctuating environment, than “dynamics” is the name of the game, this is where “plasticity” steps in, allowing for the alterations and changes which is imposed on the brain system all the time. With plasticity the brain is adaptive (i.e., reduces free energy), and computationally (cognitively) effective.

Plasticity is also at the heart of antidepressant therapies. Depression in fact correlates with neuronal atrophy and reduced plasticity, depression is also connected stressful occurrences and crises. Thus, a relationship exists between mood (probably as n emergent property) and whole brain plasticity dynamics. With proper adaptations, successful computations and plasticity-dependent reduction of free energy mood is maintained. With afflictions on plasticity, adaptability is reduced free energy increases as internal models cannot catch-up

with the changing environmental occurrences, free energy increase and as a whole, the emergent property that ensues is that of depressed mood (13, 14).

This also explains why stressful events are typically depressing, stress always involves abrupt large environmental alteration, always demanding mobilization of massive adaptability (e.g., mourning) thus inevitably involving a post-stress period of increase in free energy.

To summarize this part, the brain “beats” by evolving and organizing around life-long experiences from infancy to adulthood and beyond. While maintaining connectivity and hierarchy for whole brain stability the brain also adapts via plasticity and builds internal representations that guide our perceptions, reactions and personality styles. Plasticity offers control and stability of mood, while connectivity and headachy offer the basis for affective cognition, reasoning and intelligence.

The proper brain beat makes us what we are, well-adjusted, effective, healthy and symptomless, disturbances to any (or few) of the brain “Beats” mentioned above, generates phenomenology (signs and symptoms) of mental disorders. Thus mental disorders result from alterations to the normal “brain-beat”, “brain arrhythmias” of you will.

The patient

BP experienced unstable upbringing violent drunk father and humiliated beaten-up mother could not offer even the basic emotional needs a child requires. BP remembers that to get any attention from her mother she had to take extreme measures such as running to the busy road throwing herself under the wheels of passing cars, becoming sick by self-afflicted harm, e.g., cutting herself. As early as 10 years old she began running away from home for long periods at a time sleeping outside on park benches. Later in time, she began admissions to mental health institutes, mostly due to self-harm suicidal actions, accompanied by extreme mood swings with peaks of depression and anxiety. Thereafter behavioral problems were he rule, promiscuity was a way to get attraction and affection as a teenager, with intensive chaotic interpersonal relationships when partners were idealized, and afterward devalued. When idealized she would become intensely attracted and dependent on the relationships and once devaluated she would end the relations with hate, rejection and depression.

Clinically she was diagnosed with multiple recurring and changing mental disorders. She received the diagnosis of recurrent depression after many admissions due to depressed mood with feelings of hopelessness helplessness suicidal ideations reduced motivation and function. At times, she received the diagnosis of cyclothymia and bipolar disorder when she seemed to lack control over emotions victim to intense mood swings. Generalized anxiety was always in the background with episodic intensive anxious period that sometime qualified her with diagnosis of panic attacks.

Few hospitalizations, especially when related to crises, have seen her diagnosed as psychotic paranoid, but these were short-lived episodes. Typically, frustrations from everyday challenges and complications that she got herself into, that triggered anxious states that could turn into psychotic manifestations with paranoid ideations.

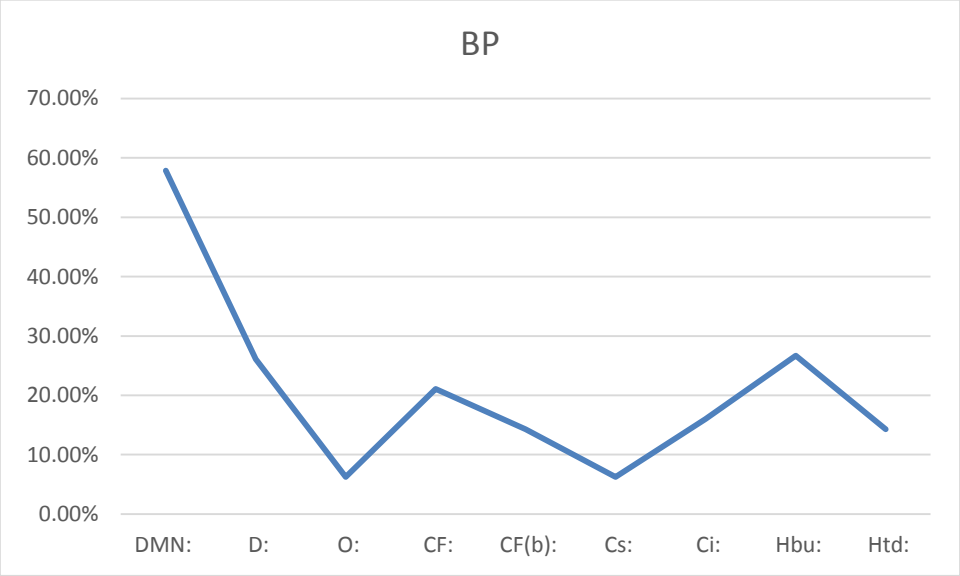
The Clinical Brain Profiling

The brain organizes with experience, plasticity is at its highest in infancy and childhood offering the best opportunity to organize and develop based on experience, thus early experiences are fundamental to brain organization. Unstable chaotic and conflicting early life conditions such as those experienced by BP predict damage to the regular optimal developmental process of brain organization. Hebbian dynamics requires repeated constant environmental signals, which emerge from a stable consistent routine of family upbringing, in the case of BP this requirement was lacking instead inconsistency and instability impeded normal Hebbian dynamics, hampering the Hebbian forces resulting in immature, partial, and perturbed internal configurations. Such biased immature internal representations inevitable mismatch the actual real-world occurrences leading to increased free energy and arises, and an emergent property of depressed mood (see above). Off course any substantial or abrupt changes in her surrounding events, such as stressors, increases mismatch, free energy, and surges with peaks of fool-blown episodes of depressions qualifying for the diagnosis of recurrent depression. At the brain network level of organization “Deoptimization” is a reasonable term to define the fact that internal representations are non-optimal and non-adaptable to real life event occurrences.

immature, partial, and perturbed internal configurations are predicted to manifest at the resting-state basic network development and in fact brain imaging research is showing initial findings of altered default-mode neural network in patients diagnosed as suffering from personality disorders (6). Being immature, and perturbed the resting state default mode network probably suffers from disturbances also to the, otherwise optimal, connectivity structure. Connectivity entails constraints between neuronal ensembles, optimal networks act as “constraint-satisfaction” systems harmonizing their activity by satisfying synaptic values distributed over the entire network (or even the entire optimal stable brain). However unstable insufficient development of the resting-sate brain organization inevitable leads to “constrain frustration” where synaptic values become incompatible (“frustrated”). “Constrain frustration” once spreads becoming the origin of whole-brain instability, is predicted to arise the emergent property of anxious mood, a phenomena that characterizes BP in most of the clinical evaluations of her illness.

Constraint frustration, if large enough, can manifest with actual connectivity "ruptures" leading to disconnection dynamics and disintegration of brain integrating hierarchy and thus collapses of whole-brain organizations leading to psychotic manifestations, were reality becomes fragmented and false references (delusions) arise from false reconciliations of fragmented neuronal network activations (15, 16). In fact, BP received the diagnosis of psychosis in few of her hospitalizations.

In all, BP shows a clinical profile (see Figure below) with dominant levels of disturbances to the Default-Mode-Network (DMN) she also suffers for substantial mismatch "Deoptimization" (D) of the internal representations accompanied by instability of "Constraint Frustration" (CF), to a lesser extent she will show some disconnection, connectivity segregation (Cs) dynamics spread within her brain.



The personalized specific Clinical Brain Profiling diagnosis of the patient BP.
X axis = vector parameters of brain disturbances (see table 1 in Appendix) Y axis percentage of phenomenology from all possible phenomenological field (see table 2 in Appendix).

The translation, and assessment details, of CBP are presented elsewhere see table 3 in the Appendix and also references 3, 15, 16, 17 and 18.

CBP is available for use open-access free-of-charge at http://neuroanalysis.org.il/?page_id=114 including a do-it-your-self Explanatory manual

The Cure

Diagnosis point to cure. Biased development of the default-mode resting-state network is the main problem causing the suffering (non-adapting) of the patient, thus correcting, re-developing and optimizing the resting-state network organization will lead to improved adaptability and symptom eliminations.

Disturbance of experience dependent plasticity was the original pathology in this case and psychotherapy as a corrective experience dependent plasticity process (6), i.e., psychotherapy is one of currently used curative techniques for such patents. Such therapy is time-consuming, and limited in efficacy, however if plasticity induction could be achieved to the extent of equating early life childhood plasticity, than the brain can be somewhat "reversed back" to early childhood plasticity dynamics, once again changeable to the extent that corrective experience can now really reorganize the internal representations, optimizing the configuration of the resting-state brain network organization and thus effectively eliminating the phenomenology of the personality disordered patient.

In effect future therapy for these patients should reprocess experience-dependent-plasticity by inducing plasticity reversing the brain to early changeable dynamics and then concomitantly offer a corrective experience targeted to correct the specific biases causing the malfunction of the specific patient. Technology such as augmented virtual-reality (19) should be involved in the corrective experience optimizing it beyond the regular psychotherapeutic sessions currently applied.

Plasticity induction should probably involve whole brain neuronal ensembles as adaptability of the entire brain would reduce free energy and have an antidepressant anxiolytic effect (see above). However it may occur that plasticity induction would require extra measures directed toward Hubs of the default-mode-resting-state network for example the prefrontal cortex. Such directed plasticity induction may require adjuvant tDCS (Transcranial Direct Current Stimulation) applications, a non-invasive supplementary intervention.

In all plasticity induction and augmented corrective experience sessions can answer for reshaping mal-adaptive internal configurations, better adaptation will eliminate situational-

generated symptoms of depression and anxiety. Overall increased plasticity will act as a general stabilizing optimizing force that further eliminate and protects from depression and anxiety.

In addition to these interventions measures should also be developed for incidents of psychosis where the network disintegrates and disconnection syndromes ensue. In these cases intervention should be more directed to neuronal network hubs and should also be algorithmic-guided probably using feedback closed-loop technology. Hubs that probably have wide-spread whole-brain connectivity regulatory powers are the Basal Ganglia medial temporal and prefrontal cortices (10). Rudimental preliminary technologies such as DBS (Deep Brain Stimulation) already exists and first efforts toward close-loop devices are now beginning, but in the future better technologies such as Optogentics (20) have more promising algorithmic specificity to rebalance connectivity and eliminate psychosis and schizophrenia phenomenology.

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Appendix

Table 1: Clinical Brain Profiling - Diagnoses

Symbol	Brain dynamic disturbance	Assumed clinical correlate
DMN	Undeveloped disturbed Default Mode Network organization	Personality disorders
Cs	Disconnectivity dynamics	Psychosis and positive signs schizophrenia
Ci	Overconnectivity dynamics	Repetitive poverty ideation perseverations
Hbu	Hierarchical bottom-up insufficiency	Avolition and negative signs schizophrenia
Htd	Hierarchical top-down shift	Systemized organized delusions
D	Deoptimization dynamic shift	Symptoms and signs of depression
O	Hyper-optimization dynamic shift	Symptoms and signs of mania
CF	Constrain frustration	Symptoms and signs of anxiety
CFb	Stimulus bound Constrain frustration	Symptoms and signs of phobias

Table 2 Phenomenological space, Signs symptoms and history

Detected	Description for scoring
Is the patient untidy?	Appearance is somewhat disheveled i.e., greasy hair, dirty clothes as in 'Grooming and Hygiene' section (1)
Is the patient very messy	Subject's clothes, body and environment are dirty and foul smelling as in 'Grooming and Hygiene section' (1)
Is the patient with excessive jewelry makeup and colored clothing?	It is evident that the clothing makeup and jewelry are grossly exaggerated. Excessiveness is the criteria. This score should not be assigned to people who are well groomed.
Moves slowly?	Obvious decrease of motor activity at interview as described in level '2' of retardation on the Hamilton Depression Scale (3) together with reduction of usage of expressive body gestures as in 'Marked' level of 'Paucity of expressive gestures' in the section of 'Affective Flattening' (1).
Stiff or frozen?	Subject never gesticulates as in 'Severe' rating of 'Paucity of expressive gestures' in the section of 'affective flattening' (1). In addition motor activity is reduced as rated for 'stupor' in the 'retardation' item of the Hamilton Depression Scale.
Restless, moves a lot?	As in 'Fidgets' in the 'Behavior at interview' score according to the Hamilton Anxiety scale (4) the patient finds it difficult to remain seated during the interview, moves a lot in the chair, moves arms legs, changes position often, he is 'Restless' as in the 'Tension' score (4).
Agitated looks as if on verge of "exploding"?	As in 'Paces' in the 'Behavior at interview' score according to Hamilton Anxiety scale (4) looks as if making the effort to restrain himself from becoming violent. Finds it hard to remain seated during the interview.
Bizarre unexplainable movement	Makes movements that are bizarre and non-purposeful, to the extent that they must be effortlessly noticed as such by interviewer and others. If the movements are explainable and their oddity is questionable then this item must not be scored as 'present'
Repetitive stereotype movements?	Movements that are repeated in the same (similar) manner; they can be 'repetitive stereotyped behavior' at the 'marked' level of the SANS (1)
Speaks slowly?	Speech is slow, words are pronounced slowly and pauses between words are longer than usual, speech must be slower than those who speak slowly. It should be easily and readily evident for the examiner, if there is doubt then this item must not be scored.

Limited verbal communication, gives short responses?	Restriction in the amount of spontaneous speech as in 'Alogia' section of the SANS (1) answers in single words or very short sentences, no spontaneous speech; the interview takes the form of investigation where the examiner repeatedly asks questions and the patient responds only briefly.
Limited verbal communication, few words only or non at all	Restriction in the amount of spontaneous speech as in 'Alogia' section of the SANS (1) Subject says almost nothing and frequently fails to answer.
Speech at low tone or whisper	'Lack of Vocal inflection' speaks in monotone, as in 'affective flattening' section of SANS (1). In addition voice is distinguishably weak
Speaks fast?	Sentences are uttered rapidly - word follows word immediately.All speech is distinguishably fast more than the regular higher spectrum of normal speech. It should be easily and readily evident for the examiner, if there is doubt, this item should not be scored.
Speaks a lot, gives long spontaneous responses?	Here the emphasis is on the volume of speech (rather than speed, the patient starts to speak continuously even when not asked any questions, once starting he never ends and it is difficult to stop him or insert a question while he is speaking).
Speaks without stopping, jumps from one issue to another?	In addition to the description of the above previous score, here the patient is practically unstoppable and speech content is disturbed in the sense that jumping from one concept to unrelated (or loosely related) concepts is the rule.
Speech with elevated tone?	Tone is elevated to the extent that the patient seems to be shouting. The tone is higher than the normal range of voice tones, if there is doubt then this item should not be scored.
Speech associations are loose; jumps from one sentence to another each a different topic?	As in 'Marked Derailment' of the SAPS (2) 'Frequent instances of derailment: subject is often difficult to follow' only 'Marked' levels warrant a score here, 'Moderate' and 'Mild' do not.
Words are unrelated within sentences 'word salad'?	As in 'Severe Derailment' of the SAPS (2) 'Derailment so frequent and / or extreme that the subject's speech is almost incomprehensible' Here also the 'Marked and Severe Incoherence' items of the SAPS (2) apply, 'At least half of the subject's speech is incomprehensible'.
Repeating same topics of conversation?	The patient is pre-occupied by a set of thoughts and repeatedly expresses them in speech. Typically this is expressed in conversation; no matter where the examiner takes the topics of discussion, the patient inevitably returns to his set of concerns. The examiner cannot divert the patient from his repeated issues for long and the patient returns to his original thoughts.
Repeating/perseverating the same sentences?	Here sentences are concretely repeated over and over again
Responding to previous question?	The patient is 'stuck' answering the first question although other additional questions were already asked. For example what is your name? John, where do you live? John… and so on
Obsessions and compulsions?	As in DSM
Delusion, false unshakable belief?	As in all delusions of the 'Delusions' chapter of the SAPS (2) rated 'Moderated' 'Marked' or 'Severe'
Systemized delusion?	Delusion is non-bizarre stable over time tends to grow incorporating new events in the experience of the patient. As in the Delusional disorder of the DSM.
Illogical conclusions?	As in 'Illogicality' SAPS (2) rated 'Moderated' 'Marked' or 'Severe'
Inappropriate affect?	As in 'Inappropriate affect' SAPS (2) rated 'Moderate' 'Marked' or 'Severe'
Flight of ideas	As in 'Pressure of speech ' SAPS (2) rated 'Moderate' 'Marked' or 'Severe'
Speech content includes mainly issues of despair, hopelessness,	As in Hamilton depression scale (3) items 'Guilt,' Helplessness,' 'Hopelessness' and 'Worthlessness' - scores 1 to 4

and pessimism.	
Speech content includes mainly issues of megalomania, over empowerment and unrealistic optimism (and plans)	The subject is concerned with issues of megalomania, over empowerment and unrealistic optimism (and plans). This must be self-evident and obvious.
Bizarre or overly abstract response to categorization (proverbs) and abstraction?	Bizarre or overly abstract response to categorization (proverbs) and abstraction
Concrete interpretation of proverbs?	Concrete interpretation of proverbs for example the common characteristic of table chair and cupboard are that they are made of wood instead of that they are all furniture. Concrete responses are given even after assisting the patient with examples of abstraction from related issues - for example "apple banana orange are fruit"
Auditory hallucinations?	As in 'Auditory Hallucinations' including voices commenting and conversing of the SAPS (2) rated 'Mild' 'Moderate' 'Marked' or 'Severe'
Visual tactile olphactory hallucinations?	As in the other 'Hallucinations' Visual tactile and olphactory of the SAPS (2) rated 'Mild' 'Moderate' 'Marked' or 'Severe'
Constricted affect	As in 'Unchanging facial expression' in the SANS (1) 'Moderate: Subject's expressions are dulled overall, but not absent' and "Marked: Subject's face has a flat 'set' look, but flickers of affect arise occasionally"
Blunt affect?	As in 'Unchanging facial expression' in the SANS (1) "Severe: Subject's face looks 'wooden' and changes little, if at all throughout the interview".
Expansive mood elevated affect?	The subject seems elated overly happy, mood is excessive in a self-evident unquestionable manner.
Dysphoric (suffering) affect?	Facial expression of suffering; uneasy as in an uncomfortable state of mind. Must be evident, if questionable no score is applied.
Depressed affect?	Facial expression is of painful sadness (typical triangle form of eyebrow). Must be evident, if questionable no score is applied.
Anxious affect?	Facial expression is of anxious form, constricted facial muscles, and bulging eye expression. Startled and / or crying expression. Must be evident, if questionable no score is applied
Detached from examiner?	The patient behaves as if the examiner (and others), are not there, seems to be reflecting on inner thoughts and is not available for whatever is occurring in the interview or around him. Must be evident, if questionable no score is applied.
Perplexed, ambivalent?	Face expression is similar to that of a person seeing something extraordinary for the first time, and seems to be lost, not knowing where to turn. Must be evident, if questionable no score is applied.
Inappropriately close to examiner (no boundaries)?	Attitude toward the examiner is as if he were a 'buddy' of the patient or a close intimate relative. Asks intimate embarrassing intruding questions, sits close to the examiner (may touch or hug him). Must be evident, if questionable no score is applied
Suspicious with examiner?	Suspicious attitude toward the examiner as if the examiner is a threat, or wants to harm the patient. Must be evident, if questionable no score is applied.
Threatening to examiner?	Seems as if about to get up and hit the examiner. Must be evident, if questionable no score is applied.
Seductive toward examiner (theatrical)?	Attitude toward the examiner is as if he were a 'buddy' of the patient or a close intimate relative but with a seducing actively probing attitude. Must be evident, if questionable no score is applied.
Sensitive easily offended?	Overly reactive easily offended, tends to respond to regular instructions as if they were harsh criticism. Must be evident, if questionable no score is applied.
Childish dependent regressive?	Attitude of the patient gives an impression of a little child, with

	childish facial expression and intonation of speech. Needs instructions and guidance even for simple tasks. Must be evident, if questionable no score is applied.
Manipulating demanding?	The examiner senses a constant uneasy feeling of being pressed or utilized to say, feel or do uncomfortable things. Must be evident, if questionable no score is applied.
Stubborn, obsessive non adaptable?	Attitude to examiner and other events are obstinate, inflexible, and repeatedly insisted upon. Must be evident, if questionable no score is applied.
Tend to idealize or devaluate examiner?	Attitude to the examiner as if he is the most wonderful and best therapist in the world, or the worst person ever; these attitudes can interchange frequently. Must be evident, if questionable no score is applied.
Egocentric un-empathic?	Thinks of no one but himself, unable to see the view point of others, cannot put himself in "others shoes" Must be evident, if questionable no score is applied.
Distractible?	Every stimulus from the environment causes the subject to turns his attention from the main course of the interview. Must be evident, if questionable no score is applied.
Disoriented?	Unable to orient himself, does not know the time and day, may not recognize faces of relatives.
Memory loss?	Unable to remember things of recent past days and weeks. Recall is typically preserved and long term memory is typically present
Complaints of Insomnia or hypersomnia?	Insomnia or hypersomnia
Complaints of Early insomnia?	Early insomnia, hard to fall asleep
Complaints of Late insomnia?	Late insomnia, early wake
Complaints of Anorexia Wight loss	Anorexia, Weight loss
Complaints of palpitations, dizziness, and / or abdominal cramps and / or tingling.	Palpitations, dizziness, and / or abdominal cramps and / or tingling.
Complaints of anxiety fear of dying or loosing control panic	Fear of dying or loosing control panic
Complaints of fear of dying or loosing control panic in specific conditions.	Fear of dying or loosing control; panic in specific conditions.
Complaints of tension, restlessness and agitation	Tension, restlessness and agitation
Complaints of avolition indifference apathy Anhedonia	Avolition, indifference, apathy, anhedonia
Complaints of depressed mood	Being sad as in the Hamilton Depression Scale items and major depression
Complaints of depressed mood especially in the morning	Being sad as in the Hamilton Depression scale items and major depression especially in the morning
Complaints about Flight of ideas?	Head full of racing thoughts
Complaints that things are strange and unfamiliar - changing not as usual (dereisim? depersonalization)	A sense that something is not usual, there are hidden meanings to things, there are forces acting behind things, things are connected in a meaningful way to the individual. Must be evident, if questionable no score is applied.
Complaints of external control, mind reading, bugging, persecution (about delusions)	Feeling as if controlled by external sources, others can read his mind; he is being persecuted. others intend and plan to hurt him. Must be evident, if questionable no score is applied
Complaints related to Systemized delusion	There is a dominating non-bizarre false idea that gradually grows and incorporates all occurrences and aspects of life. Must be evident, if questionable no score is applied
Complaints of low self esteem	Feeling worthless.

Complaints bout being easily offended, oversensitive?	Easily offended, oversensitive to criticism and insinuations. Interprets even the slightest inattention from others as rejection and humiliation. Must be evident, if questionable no score is applied.
Complaints of being impulsive, over imposing?	Reacts immediately without giving it another thought, unable to change the decision or reaction once taken. Must be evident, if questionable no score is applied
History of Delusions?	As above
History of Hallucinations?	As above
History of thought disorders loosening of associations	As above
History of thought disorders perseverations poverty of thought?	As above
History of depressions?	As in DSM criteria
History of mania?	As in DSM criteria
History of anxiety	As in DSM criteria
History of phobias	As in DSM criteria
History of disturbed upbringing, parental loose	Parents were not available (or orphan) the family history is of turmoil, instability and frequent changes. Subject deprived of needed attention care and love, or / and abused maltreated. Must be evident from anamnesis, if questionable no score is applied
History of behavioral problems	Problems at school, patient often reprimanded in school because of misbehavior, must be more than regular child's mischief; later problems with the law are typical. Must be evident from anamnesis, if questionable no score is applied
History of inability to maintain employment and social relationships?	Unable to remain employed for an extended period of time, interpersonal relationships. Are generally short and unstable; and frequently changes partners. Must be evident from anamnesis, if questionable no score is applied.
History of unstable interpersonal relationships	Interpersonal relationships chaotic, characterized by turmoil. Must be evident from anamnesis, if questionable no score is applied.
History of psychosocial or other stress (regular life stressors)	As in Holmes-Rahe life changes scale (5): Changes to different line of work, Change in number of arguments with spouse, Mortgage over $100,000, Foreclosure of mortgage or loan, Change in responsibilities at work, Son or daughter leaving home, Trouble with in-laws, Outstanding personal achievement, Wife begins or stops work, Begin or end school, Change in living conditions, Revision in personal habits, Trouble with boss, Change in work hours or conditions, Change in residence, Change in schools, Change in recreation, Change in church activities, Change in social activities, Mortgage or loan less than $30,000, Change in sleeping habits, Change in number of family get-togethers, Change in eating habits, Vacation, Christmas alone, Minor violations of the law.
History of trauma (stressor exceeding regular life stress)	As in Holmes-Rahe life changes scale (5): Death of spouse, Divorce, Martial separation, Jail term, Death of close family member, Personal injury or illness Marriage, Fired at work, Marital reconciliation, Retirement, Change in health of a family member, Pregnancy, Sex Difficulties, Gain of new family member, Business readjustment, Change in financial state, Death of close friend

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Table 3: CBP Translation Matrix

Detected	CSPD	Cs	Ci	Hbu	Htd	D	O	CF	CF(b)
Is the patient disorderly?	1	1	1	1	1	1		1	0
Is the patient very messy	0	1	1	1	0	1	0	0	0
Is the patient with excessive jewelry makeup and colored clothing?	0	0	0	0	0	0	1	0	0
Moves slowly?	0	0	1	1	0	1	0	0	0
Stiff frozen?	0	0	1	1	0	1	0	0	0
Restless moves a lot?	0	1	0	0	0	0	1	1	0
Agitated looks as on verge of blowing up?	0	1	0	0	0	0	1	1	0
Bizarre unexplainable movement	0	1	0	0	0	0	0	0	0
Repetitive stereotype movements?	0	0	1	0	0	0	0	0	0
Speaks slowly?	0	0	1	1	0	1	0	0	0
Speaks little, gives short responses?	0	0	1	1	0	1	0	0	0
Speaks little, few words only or non at all	0	0	1	1	0	1	0	0	0
Speech at low tone or whisper	0	0	1	1	0	1	0	0	0
Speaks fast?	0	0	0	0	0	0	1	0	
Speaks a lot, gives long spontaneous responses?	0	1	0	0	0	0	1	1	
Speaks without stopping jumping from one issue to another?	0	1	0	0	0	0	0	0	0
Speech with elevated tone?	0	1	0	0	0	0	1	1	
Speech associations are loose; jumps from one sentence to another each different topic?	0	1	0	0	0	0	0	0	0
Words are unrelated within sentences ‘word salad’?	0	1	0	0	0	0	0	0	0
Repeating same topics of conversation?	0	0	1	0	0	0		1	
Repeating perseverating the same sentences?	0	0	1	0	0	0	0	0	0
Responding to previous question?	0	0	0	0	0	0	0	0	0
Obsessions and compulsions?	0	0	1	0	0	0		1	
Delusion, false unshakable belief?	0	1	1	1	1	0	0	0	0
Systemized delusion?	0	0	0	0	1	0	0	0	0
Illogical conclusions are non logical?	0	1	1	0	1	0	0	0	0
Mood incongruent delusion?	0	1	0	0	0	0	0	0	0
Flight of ideas	0	1	0	0	0	0	1		
Speech content includes mainly issues of despair, hopelessness, and pessimism.	1	0	0	0	0	1	0	0	0
Speech content includes mainly issues of megalomania, over empowerment and unrealistic optimism (and plans)	0	0	0	0	0	0	1	0	0
Bizarre or overly abstract response to categorization (proverbs) and abstraction?	0	1	0	0	0	0	0	0	0

Concrete interpretation of proverbs and low abstraction?	0	0	1	1	0	0	0	0	0
Auditory hallucinations?	0	1	0	0	0	0	0	0	0
Visual tactile olphactory hallucinations?	0	0	0	0	0	0	0	0	0
Hypomimic affect	0	0	1	1	0	1		1	0
Blunt affect?	0	0	1	1	0	1	0	0	0
Expansive mood elevated affect?	0		0	0	0		1	1	1
Dysphoric (suffering) affect?	0	0	0	0	0	1	0	0	0
Depressed affect?	0	0	0	0	0	1	0	0	0
Anxious affect?	1	1	0	0	1			1	1
Detached from examiner?	0	0	1	1	0	1	0	0	0
Perplex ambivalent?	0	1	0	0	0	0	0	0	0
Inappropriately close to examiner (no boundaries)?	0	1	0	0	0	0	1	0	0
Suspicious with examiner?	1	1	1	0	1	0	0	0	0
Threatening to examiner?	1	1	0	0	1	0	0	0	0
Seductive toward examiner (theatrical)?	1	0	0	0		0	1	0	0
Sensitive easily offended?	1	0	0	0	0	0	0	0	0
Childish dependent regressive?	1	0	0	0	0	0	0	0	0
Manipulating demanding?	1	0	0	0	0	0	0	0	0
Stubborn obsessive non adaptable?	1	0	0	0	0	0	0	0	0
Tend to idealize or devaluate examiner?	1	0	0	0	0	0	0	0	0
Egocentric un-empathic?	1	0	0	0	0	0	0	0	0
Distractible?	0	1	0	0	0	0	1	1	1
Disoriented?	0	1	0	0	0	0	0	0	0
Memory lose?	0	1	0		0	0	0		0
Complaining of Insomnia or hypersomnia?	0	1	1	1	0	1	1	1	0
Complaining of Early insomnia?	0	0	0	0	0	0	0	1	0
Complaining of Late insomnia?	0	0	0	0	0	1		0	0
Complaining of Anorexia Wight loss	0	0	0	0	0	1	1	0	0
Complaining of palpitations, dizziness, abdominal cramps and tingling.	0	0	0	0	0	0	0	1	0
Complaining of anxiety fear of dying or loosing control panic	0	0	0	0	0	0	0	1	0
Complaining of fear of dying or loosing control panic in specific conditions.	0	0	0	0	0	0	0	0	1
Complaining of tension restlessness and agitation	0	1	0	0	0	0	1	1	0
Complaining of avolition indifference apathy Anhedonia	0	0	1	1	0	1	0	0	0
Complaining of depressed mood	0	0	0	0	0	1	0	0	0
Complaining of depressed mood especially in the morning	0	0	0	0	0	1		0	0
Complaining about Flight of ideas?	0	1	0	0	0	0	1	0	0
Complaining that thing are strange unfamiliar changing not as usual (dereisim depersonalization)	0	1	0	0	0	0	0	0	0
Complaining of external control, mind reading, bugging, persecution (about delusions)	0	1	1	0	0	0	0	0	0
Complaining related to Systemized delusion	0	0	0	0	1	0	0	0	0

Complaining of low self esteem	1	0	0	0	0	1	0	0	0
Complaining about being easily offended, oversensitive?	1	0	0	0	0	0	0	0	0
Complaining of being impulsive, over imposing?	1	0	0	0	0	0	0	0	0
History of Delusions?	0	1	1	0	0	0	0	0	0
History of Hallucinations?	0	1	0	0	0	0	0	0	0
History of thought disorders loosening of associations	0	1	0	0	0	0	0	0	0
History of thought disorders perseverations poverty of thought?	0	0	1	0	0	0	0	0	0
History of depressions?	0	0	0	0	0	1	0	0	0
History of mania?	0	0	0	0	0	0	1	0	0
History of anxiety	0	0	0	0	0	0	0	1	0
History of phobias	0	0	0	0	0	0	0	0	1
History of disturbed upbringing, parental loose	1	0	0	0	0	0	0	0	0
History of behavioral problems	1	0	0	0	0	0	0	0	0
History of coping deficiency work and social?	1	0	0	0	0	0	0	0	0
History of instable interpersonal relationships	1	0	0	0	0	0	0	0	0
History of psychosocial or other stress (regular life stressors)	0	0	0	0	0	1	0	1	1
History of trauma (stressor exceeding regular life stress)	0	1	1	0	0	1	0	1	1