

Neuropsychanalysis of Psychiatric Unbalance: Impairing Either Emotional Balance or Learning Correction

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Abstract

Introduction: It was Freudian psychoanalysis that demonstrated the psychiatric unbalance with three psychological elements, the unconscious/preconscious/conscious in topographic theory, and id/ego/super-ego in structural theory. **Purpose:** It was aimed to review the scientific neuropsychanalysis for psychiatric unbalance. **Methods:** It was searched the papers from Pubmed, Researchgate and Baidu, and then classified and summarized. **Results and Discussions:** It was supplemented by Cai the reticular noradrenergic(NA), serotonergic(5-HT), acetylcholinergic(ACh) and later dopaminergic(DA) systems to depression and anxiety for Freudian topographic theory, while the reticular DA and ACh systems to schizophrenia and dementia for structural theory. It was termed these reticular systems altogether as the new element "reticula" for neuropsychanalysis, while it was classified the neuropsychanalysis into six elements as aversion/motivation/perception/behavior/memories/reticula, unified for depression, anxiety and schizophrenia. Furthermore, it was demonstrated that the rapid eye movement(REM) sleep processed emotional memories and resulted in atonia, shifting the emotional balance toward depression by atonic drive dissipation, supporting Freudian topographic theory, while the slow wave sleep(SWS) ameliorated anxiety/depression and supplemented a new half story of neuropsychanalysis the Freudian psychoanalysis neglecting. **Conclusions:** It is convenient to demonstrate the psychiatric unbalance via interactions/conflicts of six elements as aversion/motivation/perception/behavior/memories/reticula, diagnosing abnormalities in such processes as reticular regulation, sleep function, muscular tension, microglial activity and so on, impairing either emotional balance or learning correction in psychiatric patients.

Keywords: Emotion; Reticular formation; Sleep; Learning; Muscular tension.

1. Introduction

In traditional Freudian psychoanalysis, it was convenient to demonstrate the psychiatric unbalance by three psychological mental elements, as the unconscious/preconscious/conscious in topographic theory (Bergmann, 2008; Cai, 2016, 2018a), and id/ego/super-ego in structural theory (Bergmann, 2008; Cai, 2021; Rizzolatti et al., 2014; Salone et al., 2016).

The neuropsychanalysis, as the neuropsychological investigations for the scientific basis of psychoanalysis, is now prospective for both neuropsychological research and review (Cai, 2016, 2018a, 2021; Johnson & Flores Mosri, 2016; Rizzolatti et al., 2014; Salone et al., 2016). In this article, from the recent progressions of scientific neuropsychanalysis, it is reviewed and classified the underlying mechanisms causing the important forms of psychiatric unbalance.

2. Methods

2.1. Subject

It was aimed to review the progressions in psychiatry and neuropsychanalysis to classify mechanisms for psychiatric unbalance.

2.2. Search

As interdisciplinary unpractical to review all literatures in all subfields, review articles were frequently selected to demonstrate comprehensive progressions of subfields instead. Usually, these comprehensive review articles were consistent with each other in the same subfield. The very few exceptional results or contradictory arguments were discussed or explained in section "Classifications and Discussions", such as the strange mechanisms for total sleep

deprivation against depression. Besides, opposite opinions were also integrated together by classification into several elements and mechanisms in section “Classifications and Discussions”.

Papers were searched from Pubmed, Researchgate and Baidu Xueshu. The words adopted in search were included mainly as but not limited to the followings: (a) Psychoanalysis; (b) depression; (c) anxiety; (d) schizophrenia; (e) noradrenergic(NA); (f) serotonergic(5-HT); (g) dopaminergic(DA); (h) acetylcholinergic(ACh); (i) memory; (j) slow wave sleep(SWS); (k) rapid eye movement(REM) sleep; (l) muscle tone, etc. Sometimes, several of these words were simultaneously utilized, such as: (a) anxiety, SWS; (b) depression, REM sleep; (c) schizophrenia, dopaminergic; etc.

2.3. Inclusion/Exclusion Criteria

Priority was given to select the newest reviews for comprehensive progressions in subfields. If unavailable or insufficient, related reviews more than 10 year ago were selected. If still unavailable or insufficient, the original articles of hypotheses or special experimental results were selected.

2.4. Content Extraction and Thematic Organization

The searched contents, mostly reviews and some original articles of hypotheses or special experiments, on progressions in psychiatry and neuropsychology for psychiatric unbalance, were selected in text, and then classified, discussed in section “Classifications and Discussions”, and finally summarized in section “Conclusions”.

3. Results

3.1. Neuropsychological Explanations of Freudian Mental Elements

3.1.1. Neuropsychological explanations for Freudian topographic elements

Freudian topographic psychoanalysis divides the psychological mental elements into the unconscious, preconscious, and conscious (Bergmann, 2008; Cai, 2016, 2018a). Herein, it is adopted the corresponding neuropsychological concepts to explain the unconscious/preconscious/conscious in topographic theory, as the followings:

(a) Unconscious: The various instincts explain the physiological unconsciousness in Freudian topographic psychoanalysis (Cai, 2016, 2018a), present in vertebrates as motivational hunger, thirst or sex, and aversive fear or anger (Cai, 2018a).

(b) Preconscious: In humans, the acquired postnatal memories and habits are stored as memories, habits and language, while linguistic contents are also remote or recent declarative memories (Cai, 2015, 2017). Because these memories can be reactivated or recalled individually for usage upon requirements (Bergmann, 2008; Cai, 1990, 2018b), they are stored in brain as inactive or preconscious state before usage, explaining the preconscious element in Freudian topographic psychoanalysis (Cai, 2016, 2018a).

(c) Conscious: The neuropsychological consciousness indicates the ability to integrate the ongoing perception, movement, memory, emotion in brain for complex comprehension and behavior (Bergmann, 2008), explaining the conscious element in Freudian topographic psychoanalysis.

In brief, the corresponding neuropsychological concepts instincts/memories/consciousness explain the unconscious/preconscious/conscious mental elements in Freudian topographic psychoanalysis respectively (Cai, 2016, 2018a).

3.1.2. Neuropsychological explanations for Freudian structural elements

For neuropsychological explanations of id/ego/super-ego elements in Freudian structural psychoanalysis, the id can be explained as the basic instincts of motivation (Cai, 2021; Chenu & Tassin, 2014; Meissner, 2009), operating without realistic or foreseen ranges (Bergmann, 2008; Cai, 2021; Chenu & Tassin, 2014; Meissner, 2009). The ego is learned and accumulated gradually, becoming the selfish behaviors including skills, mediating the urge of id to operate on the external realities (Bergmann, 2008; Cai, 2021; Rizzolatti et al., 2014; Salone et al., 2016). The super-ego can be explained as the common social knowledge for law, home and job, the self-observation, self-criticism and other reflective behaviors (Bergmann, 2008; Cai, 2021), influencing related comprehension (Li et al., 2021). Although called as structural theory of psychoanalysis, the id/ego/super-ego are all behavioral or psychological elements, but not anatomical, related to neuropsychological motivation/selfishness/knowledge, respectively.

3.2. The Reticular Supplements to Freudian Psychoanalysis

3.2.1. The Reticular Supplements to Freudian Topographic theory

The ascending reticular systems have not been mentioned in Freudian psychoanalysis, which would therefore supplement the Freudian psychoanalysis.

Subconscious was originally termed by Pierre Janet (Bühler & Heim, 2009), while preconscious was adopted by Freudian psychoanalysis (Bergmann, 2008). Recently, Cai pointed out that memory accumulation in limbic forebrain explained a portion of subconscious(preconscious) reserves, which were transiently suppressed to increase signal/noise in waking by the ascending reticular NA (Cai, 1991, 1995, 2016). Likewise, the preconscious declarative memories in cortical areas are usually activated by Ach (Cai, 1990, 2018b). Altogether, the preconscious memory reserves are regulated by the reticular NA and ACh systems.

For unconscious or emotional balance, it was reviewed that postmortem and biochemical studies demonstrated the decrease in 5-HT, NA, and DA as relevant to depression and anxiety (Liu et al., 2018). In consistence, NA is usually inhibitory on irrelevant memories while improves signal/noise (Madison & Nicoll, 1986), integratively disinhibiting motivation/unconscious (Liu et al., 2018), while DA is active during pleasure (Chenu & Tassin, 2014), disinhibiting motivation (Ikemoto et al., 2015).

3.2.2. The Reticular Supplements to Freudian Structural Theory

Cai analogously supplemented the ascending DA and ACh systems to regulate the id, ego and super-ego in Freudian structural psychoanalysis (Cai, 2021).

For id or motivation, the DA systems are excitatory/disinhibitory while the ACh systems depressive (Cai, 2021). (a) DA was suggested to be related to pleasure of id (Chenu & Tassin, 2014), while DA in both ventral tegmental area and substantia nigra shown to regulate motivation (Ikemoto et al., 2015). Especially, DA regulated the GABAergic interneurons in basal ganglia, thereby directly disinhibitory to motivation/id (Ikemoto et al., 2015). (b) Hyper- or hypo-ACh states may cause depression or mania (Dilsaver, 1986), inhibiting or exciting motivation/id respectively.

For ego as the selfish behaviors and skills, the DA systems are beneficial while ACh systems restrictive (Cai, 2021). (a) DA in associative striatum has been reviewed as increase in schizophrenia (Kesby et al., 2018; Weinstein et al., 2017), suggesting to integratively inhibit the memories-associated comprehension of perception (Cai, 2024), compatible with the downstream hypoconnectivity between prefrontal-limbic cortices and thalamic nuclei as well as hyperconnectivity between somatomotor cortex and thalamic nuclei (Avram et al., 2018; Giraldo-Chica & Woodward, 2017; Tu et al., 2015), while Cai criticized the opposite assumption as DA activation of associative striatum in that it would correct memories, improve comprehension and ameliorate schizophrenia following repetition of reward/punishment (Cai, 2024). Besides, DA in basal ganglia has been suggested for various procedural learning and memory (Foerde & Shohamy, 2011; Shohamy et al., 2008), which can improve the ability of ego as selfish behaviors and skills. (b) ACh was shown in biochemical consolidation of working memories (Mishkin & Appenzeller, 1987), to restrict behavioral failures to improve success. Besides, it has been suggested ACh could reduce in some schizophrenia (Tani et al., 2015), implicating ACh may decrease ego, contrary to DA.

For super-ego as the common knowledge including law, home, job, and many affected behaviors requiring comprehension from them, DA can coordinate the selective attention of super-ego while ACh can excite the super-ego (Cai, 2021). (a) DA has been reviewed as involved in selective attention and working memory (Bahmani et al., 2019), while dysfunction of DA being hypothesized as one of the important pathologies for attention-deficit/hyperactivity disorder (Genro et al., 2010). (b) ACh has been reviewed as involved in the pathophysiology and treatment of Alzheimer's dementia (Hampel et al., 2018), exciting the super-ego. In consistence, ACh can directly excite the relevant words in sentence (Cai, 2015, 2017; Lewis & Bastiaansen, 2015), recall the declarative memories (Cai, 2018b), and so on.

3.3. Six Neuropsychanalytic Elements Replacing Freudian Mental Elements

It was recently united altogether the elements in Freudian topographic theory and structural theory, and formulated a unified classification of neuropsychological elements for neuropsychanalysis (Cai, 2024).

There are six neuropsychological elements for the unified neuropsychanalysis, as aversion, motivation, perception, behavior, memories and reticula (Cai, 2024). Emotional balance for psychiatry is divided into two opposite elements as aversion and motivation, explaining unconscious in topographic theory and id in structural theory (Cai, 2024). Perception is input to conscious in topographic theory, and forms comprehension with related memories, explaining hallucination in schizophrenia in structural theory (Cai, 2024). Behavior contains selfish ego in structural theory (Cai, 2024), while memories explain preconscious in topographic theory and knowledge of super-ego in structural theory (Cai, 2024). Reticula, termed altogether by Cai for the reticular NA, 5-HT, DA and ACh systems, is the new element from neuropsychanalysis to supplement Freudian psychoanalysis (Cai, 2023, 2024).

Accordingly for unification, the six neuropsychological elements of neuropsychanalysis as aversion/motivation/perception/behavior/memories/reticula can contain, replace or supplement all elements in both Freudian topographic theory and structural theory (Table 1).

3.4. The Sleep Functions Supporting and Supplementing Freudian Psychoanalysis

3.4.1. The Functions of REM Sleep Supporting Freudian Topographic Theory

Sleep functions are the most secret and intricate contents of psychoanalysis. More than 100 years ago, Sigmund Freud suggested that the instinctual wishes and drives should interact and conflict with the memories and situations exposed in dreams in topographic psychoanalysis (Cai, 2016, 2018a). In 1991 and 1995, Cai suggested that the REM sleep might complement the function of SWS and shift the balance of emotion toward drive dissipation or even depression with retention of emotional memories accumulated during waking (Cai, 1991, 1995, 2016).

There have been many neuropsychological and clinical evidences supporting the compatibility of REM sleep with Freudian psychoanalysis. Many repeated experiments demonstrated that the REM sleep played roles in retention of emotional memories (Baran et al., 2012; Groch et al., 2013; Menz et al., 2013; Nishida et al., 2009; Popa et al., 2010), a portion of preconscious memories. Compatibly, REM sleep deprivation was early reported as therapeutic against depression in humans (Vogel, 1975, 1983), and ameliorative against fear in rats (Hicks & Moore,

1979). Recently, there have been many reviews demonstrating that the REM sleep tends to disrupt the emotional balance toward depression (Baglioni et al., 2014; Medina et al., 2014; Palagini et al., 2013), against motivation of unconscious.

Cai pointed out that the atonia in REM sleep would decrease the muscular tension in motivation and attenuate the motivational behaviors (Cai, 2018a), suggesting the atonic effects for depression from excessive REM sleep (Cai, 2018a). In contrast, REM sleep manifested decrease or no change in anxiety (Fuller et al., 1997; Papadimitriou & Linkowski, 2005), further supporting the relevance of atonic reduction of motivation for depression. As it is a new phenomenal link between atonic reduction of motivation for depression by REM sleep, it is prospective to investigate more in future.

In brief, the compatible functions of REM sleep have supported Freudian topographic psychoanalysis in depression, inhibiting or conflicting the motivation of unconscious by both atonia and preconscious memories in dreams (Cai, 2016, 2018a)(Table 2).

3.4.2. The functions of SWS supplementing Freudian topographic theory

Cai demonstrated early that SWS functioned to adjust the emotional balance disrupted by accumulated emotional memories (Cai, 1991, 1995, 2016), against depression and anxiety, while opposite to the REM sleep. The clinical observations and behavioral evidences have accumulated in the followings: (a) Shorter duration of SWS has widely been demonstrated in association with depression (Baglioni et al., 2014; Medina et al., 2014; Mendlewicz & Kerkhofs, 1991) and anxiety (Bourdet & Goldenberg, 1994; Fuller et al., 1997), with the observations in anxiety being more evident as no complicated increment of REM sleep (Fuller et al., 1997; Papadimitriou & Linkowski, 2005). (b) Sleep deprivation was shown to result in negative mood disturbances as depression, anxiety, frustration, tension and so on (Kahn-Greene et al., 2007), while selective deprivation of stage 4 SWS to produce a depressive or hypochondriacal state (Agnew et al., 1967). (c) It has been adopted for long to ameliorate depression by increasing SWS in early sleep with phase advance of sleep (Bunney & Bunney, 2012; Wehr et al., 1979). (d) It was reported the high delta sleep ratio might help prevent the early recurrence of unipolar affective disorder (Kupfer et al., 1990). In all, it is evident that SWS plays important roles in emotional regulation against depression and anxiety.

For memory, Cai suggested that accumulation of emotional memories acquired in waking would disrupt emotional balance (Cai, 1991, 1995, 2016), compatible with numerous observations, such as aversive memories in causing anxiety (Raymundi et al., 2020; Seinsche et al., 2023), leaned helplessness in causing depression (Pryce et al., 2011), and so on. In contrast, memories would also be processed in SWS when adjusting emotional balance. SWS has been reviewed to help retention of declarative memory in humans (Inostroza & Born, 2013; Rasch & Born, 2013), but was reported to impair memory in aversive learning tasks in animals (Hars & Hennevin, 1987; Rideout et al., 1979). At the cellular level, it was reported that SWS mainly favored hippocampal long-term depression(LTD) by slow delta wave (Yang et al., 2012a, 2012b), thereby integratively inhibitory to irrelevant preconscious memories, while only induced long-term potentiation(LTP) in hippocampus by sharp-wave ripples (Cai, 2019; Sadowski et al., 2016), increasing signal/noise at the inhibitory slow delta background.

Accordingly, Cai recently put forward that SWS supplemented a new half story of neuropsychology on emotion and memory neglected by Freudian psychoanalysis (Cai, 2016, 2018a), ameliorating aversion while integrative inhibiting irrelevant preconscious memories to increase signal/noise (Table 2).

3.4.3. The impairment of SWS in schizophrenia

SWS is also impaired in a portion of schizophrenia, converging with observations in depression (Baglioni et al., 2014; Medina et al., 2014; Mendlewicz & Kerkhofs, 1991) and anxiety (Bourdet & Goldenberg, 1994; Fuller et al., 1997). There is review demonstrating reduction of SWS in schizophrenia (Chan et al., 2017)(Table 2), in both slow wave and spindle (Mayeli et al., 2024). It can be speculated that the SWS impairment in schizophrenia could share the same mechanisms as depression and anxiety in causing psychiatric unbalance.

4. Classifications and Discussions

4.1. Classification of Neuropsychanalytic Elements

In this article, it is integratively reviewed the important progressions of scientific neuropsychology, not only supporting but also supplementing the core contents of Freudian psychoanalysis.

It has been supplemented the reticular NA, 5-HT, DA and ACh systems to Freudian topographic psychoanalysis for depression and anxiety (Cai, 2016, 2018a; Liu et al., 2018), while analogously supplemented the reticular DA and ACh systems to Freudian structural psychoanalysis for schizophrenia and dementia (Cai, 2021, 2024). These reticular systems have been termed altogether as the new element "reticula" of neuropsychology in supplement to Freudian mental elements (Cai, 2023, 2024).

It has recently been united altogether all the elements in Freudian topographic theory and structural theory, and formulated a unified classification of six neuropsychological elements of neuropsychology, as aversion/motivation/perception/behavior/memories/reticula (Cai, 2024).

4.2. Classification of Sleep Functions

Recent progressions on sleep functions have been successfully applied to neuropsychology. On the one hand, the functions of REM sleep on atonia, memory and emotion have supported Freudian topographic theory in depression, inhibiting the motivation of unconscious by both atonic drive dissipation and emotional memory

retention (Cai, 2016, 2018a). On the other hand, it has been supplemented SWS as a new half story of neuropsychology neglected by Freudian topographic theory, ameliorating unbalanced emotional aversion in depression and anxiety (Cai, 2016, 2018a).

SWS impairment in a portion of schizophrenia implicates it could share the same pathological mechanisms as depression and anxiety.

4.3. Impairment of Either Emotional Balance or Learning Correction in Psychiatry

Cai pointed out that learning would correct memories, improve comprehension and ameliorate psychiatric unbalance following repetition of reward/punishment (Cai, 2024). Accordingly, psychiatric patients must be impaired on either emotional balance or learning correction so as to fail in correction of psychiatric unbalance. This article should also classify the mechanisms causing the impairment of either emotional balance or learning correction for psychiatry.

4.3.1. Reticular Regulation

Dysfunction in reticular regulation falls into two kinds in mechanism. (i) DA can directly excite appetite and motivation (Chenu & Tassin, 2014; Ikemoto et al., 2015), while 5-HT, NA, and DA dysfunction may result in depression (Liu et al., 2018). In this situation, direct unbalance in aversion and motivation would also cause dysfunction of reward/punishment for learning. (ii) Increment of DA in associative striatum in schizophrenia (Kesby et al., 2018; Weinstein et al., 2017) can suppress the memories-associated comprehension of perception (Cai, 2024), impairing learning correction by inhibition of comprehension from perception.

4.3.2. SWS Function

SWS functions to adjust the emotional balance disrupted by accumulated emotional memories in waking (Cai, 1991, 1995, 2016, 2019), against depression and anxiety. Reduction in SWS in depression and anxiety would result in unbalance in aversion/motivation, and in turn affect reward/punishment for learning.

4.3.3. Muscular Tension

As the atonic REM sleep increases in some depression (Cai, 2018a), but not in anxiety (Fuller et al., 1997; Papadimitriou & Linkowski, 2005), Cai suggested that REM sleep result in depression by atonic drive dissipation (Cai, 2018a), likewise causing unbalance of aversion/motivation, and in turn affecting reward/punishment for learning. More investigations are prospective in this new field.

4.3.4. Microglial Activity

Microglia supplemented here are the resident immune cells in brain, and regulate inflammation, synaptic plasticity, and formation of neural networks. It has been reviewed that abnormal microglial activity may cause abnormal synaptic plasticity and learning, and result in both depression (Rahimian et al., 2021; Wang et al., 2022) and schizophrenia (Germann et al., 2021; Rahimian et al., 2021). Abnormality in learning impairs the adaptive correction in the diseases.

Tables 3 outlines the neuropsychanalytic mechanisms impairing either emotional balance or learning correction for psychiatric unbalance.

4.4. Reticular Mediation of Total Sleep Deprivation against Depression

It was reported that total sleep deprivation could temporarily ameliorate depression for a few days, with recovery sleep even as naps resulting in relapse of depression, while irrelevant to SWS and REM sleep in naps (Wiegand et al., 1993). Thus it seemed that total sleep deprivation was not consistent with the antidepressant effects of SWS, while other effects of total sleep deprivation rather than SWS could mediate the antidepressant effects. Later, it was reported that total sleep deprivation changed central NA metabolism in depressive patients (Müller et al., 1993), increased 5-HT and NA of brain synapses in rats (Hipólido et al., 2005), and increased DA in brain in mice (Wu et al., 2024). Obviously, the reticular NA, 5-HT and DA changes in brain following total sleep deprivation could account for the temporary antidepressant effects (Table 3).

4.5. Neuroimaging of Impairments in Psychiatry

Neuroimaging has also revealed the impairments of either emotional balance or learning correction in brain structures of psychiatric patients.

For depression, neuroimaging studies have revealed the hippocampus, amygdala, orbitofrontal and cingulate cortices as mostly affected brain regions in depression (Sindermann et al., 2021; Zacková et al., 2021), the brain structures for both emotions and memories.

For schizophrenia, neuroimaging studies have revealed DA as increase in associative striatum in schizophrenia (Kesby et al., 2018; Weinstein et al., 2017). Besides, neuroimaging studies have also suggested the hypoconnectivity between prefrontal-limbic cortices and thalamic nuclei, as well as the hyperconnectivity between primary-sensorimotor cortices and thalamic nuclei (Avram et al., 2018; Giraldo-Chica & Woodward, 2017; Tu et al., 2015), extending consistently to basal ganglia in schizophrenia (Avram et al., 2018). It has been suggested that hyperconnectivity between primary-sensorimotor cortices and thalamic nuclei represent neuroimaging overactivation

of simple ego because of striatal DA suppressing the memories-associated comprehension of perception in schizophrenia (Cai, 2024).

4.6. Implications to Mania

Mania is left without consideration in this article yet. Up to now, most studies have been focused on the bipolar manic-depressive diseases complicated with two opposite symptoms, while few results are available for pure manic symptom, therefore it is required more investigations.

With neuropsychanalysis into mechanisms impairing either emotional balance or learning correction, it is likewise prospective to inspect the similar processes impaired in mania. (a) For reticular regulation, it was reviewed mania as a state of hyperdopaminergia (Ashok et al., 2017), while it was reported that dopamine agonist cabergoline could cause manic episodes (Yüksel et al., 2016). (b) For muscular tension, it was reported that improvement of manic symptoms in humans was accompanied by increase in REM% and REM density (Pacchioni et al., 2023), while chronic deprivation of atonic REM sleep in rats led to manic-related behaviors (Abbasi et al., 2024).

5. Conclusions

Freudian psychoanalysis is convenient to demonstrate the psychiatric unbalance with three interactive mental elements. In this article, it is explained the three Freudian elements by neuropsychology, with unconscious/preconscious/conscious in Freudian topographic theory by emotions/memories/consciousness, and id/ego/super-ego in structural theory by motivation/selfishness/knowledge, respectively. For reticular supplements, it has been supplemented the reticular NA, 5-HT, DA and ACh systems to Freudian topographic psychoanalysis for depression and anxiety, and likewise the reticular DA and ACh systems to Freudian structural psychoanalysis for schizophrenia and dementia. These reticular systems have altogether been termed as the new mental element reticula. It has been united altogether all the elements in Freudian topographic theory and structural theory to formulate a unified classification of six neuropsychological elements of neuropsychanalysis, as aversion/motivation/perception/behavior/memories/reticula.

On sleep, it has been demonstrated that the REM sleep processes emotional memories and results in atonia, shifting the emotional balance toward depression, supporting the Freudian topographic theory by both memory retention and atonic drive dissipation, while SWS functions against depression and anxiety more evidently in latter without increment of REM sleep, supplementing a new half story of neuropsychanalysis not mentioned in Freudian psychoanalysis.

Psychiatric diseases disrupt the psychiatric balance in such processes as reticular regulation, sleep function, muscular tension, microglial activity, and so on, resulting in impairment of either emotional balance or learning correction in patients.

Acknowledgment

It is acknowledged herein that the classification of neuropsychanalysis into six elements as aversion/motivation/perception/behavior/memories/reticula was made by Zi-Jian Cai in response to many expectations of world people to unify Freudian topographic psychoanalysis and structural psychoanalysis for depression, anxiety and schizophrenia.

Competing Interests

The author declares no conflict of interest for this work.

Author's Contributions

The sole author responsible for all process of the paper.

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Table-1. Six neuropsychanalytic elements unifying Freudian mental elements

Neuropsychanalytic Elements	Relationship with Freudian Elements	Typical Psychiatric Pathology
Aversion	A negative element of emotional balance replacing a part of unconscious	Aversion overactivated in (a) depression, (b) anxiety
Motivation	A positive component of emotional balance replacing (a) id, (b) a part of unconscious	Motivation suppressed in depression
Perception	Replacing as input to conscious, forming comprehension with related memories	Perception wrong as hallucination, without forming comprehension with related memories since suppressed by DA in associative striatum in positive schizophrenia
Behavior	Containing ego, and replacing behavioral output of conscious	Behavioral output simple with comprehension suppressed by DA in associative striatum in positive schizophrenia
Memories	Replacing preconscious, and containing knowledge of super-ego	(a)Aversive memories accumulated to cause anxiety and depression; (b)not forming comprehension with perception since suppressed by DA in associative striatum in positive schizophrenia
Reticula	Termed altogether for reticular NA, 5-HT, DA and ACh systems, supplementing Freudian psychoanalysis	(a)Deficits in DA or NA causing depression, while DA activating pleasure or motivation; (b)comprehension suppressed by DA in associative striatum in positive schizophrenia

Abbreviations: ACh=acetylcholine, DA=dopamine, NA=noradrenaline, 5-HT=serotonin

Table-2. Division of sleep functions

	SWS	REM Sleep
Anxiety	Decrease	Decrease or no change
Depression	Decrease	Increase in a portion of depression
Schizophrenia	Decrease in a portion of schizophrenia	Under more investigations
Function	Adjusting emotional balance against aversion in depression and anxiety	Shifting the emotional balance toward depression by both atonic drive dissipation and retention of emotional memories
Neuropsychanalysis	Supplement to Freudian psychoanalysis	Support to Freudian psychoanalysis

Abbreviations: REM Sleep=rapid eye movement sleep, SWS=slow wave sleep

Table-3. Neuropsychanalytic mechanisms impairing either emotional balance or learning correction in psychiatric diseases

Processes Abnormal in Psychiatric Diseases	Mechanisms Impairing Either Emotional Balance or Learning Correction in Psychiatric Diseases
Reticular Regulation	(a)DA exciting appetite/motivation, while reduction in DA and NA causing depression, thus DA and NA dysregulation causing unbalance in aversion/motivation, and in turn affecting reward/punishment for learning correction; (b)increment of DA in associative striatum in schizophrenia suppressing the memories-associated comprehension of perception, and therefore impairing learning correction; (c)NA, 5-HT and DA alterations in brain responsible for the temporary antidepressant effects of total sleep deprivation
Sleep Function	SWS adjusting the emotional balance against aversion in depression and anxiety, with SWS reduced in depression and anxiety causing unbalance in aversion/motivation, and in turn affecting reward/punishment for learning correction
Muscular Tension	REM sleep of atonia increasing in some depression but not anxiety, resulting in atonic drive dissipation, and in turn affecting reward/punishment for learning correction
Microglial Activity	Abnormal microglial activity impairing synaptic plasticity and adaptive learning to correct the psychiatric unbalance in depression and schizophrenia

Abbreviations: DA=dopamine, NA=noradrenaline, REM Sleep=rapid eye movement sleep, SWS=slow wave sleep, 5-HT=serotonin