Pedophilia in the Context of Entropy Neuron Glial Networks of the Brain

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Introduction

Pedophilia - a mental disorder, one of many paraphilia. According to the Tenth revision (ICD-10) international classification of diseases (ICD) belongs to the class V as one of the disorders of sexual preference (F65 code.4): a sexual preference for children, boys or girls, or both, usually of prepubertal or early pubertal age. In the broadest sense, pedophilia means sexual attraction to children [1]. From a legal point of view it acts as a sexual nature committed by an adult against a minor and considered law as a crime [2,3]. Currently, this problem is of great social importance. The bulk of the population, fueled by the media, tend to see in this phenomenon the perversion of morals, you need to burn with a hot iron criminal prosecution, forgetting that, ideally, a criminal punishment-not revenge for what he did, as an educational measure. However, is it possible to raise a sick man? The bulk of pedophiles implements sexual needs only in appropriate sexual fantasies, masturbatory fantasies, non-sexual communication with children, communicating on the Internet, viewing visual products relevant content. Pedophilia is diagnosed largely in males of heterosexual orientation. The public also submitted to sexual predators who kidnap children, they brutally raped and murdered. Conceptual transfer occurs on all pedophiles represent about a serial killer: “they’re all the same”. But among this group the bulk of the people in a rather respectable age, well-educated workers in culture, clergy, politicians and even mayors of major cities.

The more obscure the legal conflict in which there are people suffering from pedophilia. Justice does not recognize those sick, despite the fact that medicine is a mental state recognized as a disease. The legal aspect of this problem is beyond our consideration. After long deliberations the most prominent scientists in the beta version of ICD-11 pedophilia recognized as a “paedophilic disorder”, i.e. almost returned to the old interpretation in ICD-10 (F65.4 Pedophilia). Many disputes that are under way around the pedophilia and other sexual deviations are the controversy surrounding the empty space. Freud called sexual deviation is the lack of sex, and all the rest of sexual

Abstract

In article attempt of systematization of the neurophysiological changes observed in cases of pedophilia using the new method is the dispersion of amplitude-frequency characteristics of the alpha rhythm - with the aim of identifying common patterns of development of psychopathology, creating a natural-scientific systematization of mental illness on the basis of dimensional neurophysiological methods and objective assessment of the patient in the practice of forensic psychiatric examination.

Keywords: Neurophysiological causes of pedophilia; Entropy of the neuron-glial network of the brain; Dispersion of alpha-rhythm; Diagnosis of mental illness

Abbreviations: PD: Personality disorder (F60.x ICD-10); BPD: Borderline personality disorder; BS: Burnout Syndrome; PPhH: Pedophilia in all categories of psychopathology; PPhH: Pedophilia in the category of healthy; DSc: Debut of paranoid schizophrenia (F20.09x ICD-10); DAFCAR: Dispersion of Amplitude-Frequency Characteristics of the alpha rhythm EEG; NGNB: Neuron-Glial Network of the brain; HVT: Hyperventilation test; CDα: Coefficient of Dispersion of alpha-Rhythm EEG-1 (the quotient of the moral values of power of alpha rhythm to his total power in the range of 7-13 Hz); CDα2: Coefficient of Dispersion of the alpha-Rhythm EEG-2 (the quotient of the power of the alpha rhythm in the range of “a modal value ±0.5 Hz” to his total power in the range of 7-13 Hz); O Mo: Value of the Modal Frequencies in Occipital Electrodes; F Mo: Value of the Modal Frequencies in Frontal Electrodes; O Mo - F Mo: Value of the Difference of Modal Frequencies Between the Occipital and Frontal Electrodes; IIDα: Integral Index of Dispersion of the Alpha rhythm EEG (Value of the Kurtosis of the Normal Distribution CDα in the Occipital Electrodes); ADA: Asymmetry Distribution of the Alpha rhythm EEG (Value of the Asymmetry Distribution CDα in the Frontal Electrodes); IH: Value of the Index Hypofrontality (Kurtosis of the Normal Distribution CDα in the Frontal Electrodes); AH: Value of the Asymmetry of CDα in the Frontal Electrodes; CV: The coefficient of variation; CI: Confidence interval; Cu: conditional unit
preferences. All these many respected scientists in the relation of pedophilia to express their moral and legal preferences that the subject matter is irrelevant, because this argument has no scientific basis, because in no way affiliated with dimensional research methods of the human psyche [4].

A. The objectives of the study: To determine whether there are objective preconditions for dimensional diagnosis of pedophilia and assigning it to a category of psychopathology.

Materials and Methods

With the help of methods of analysis DAFCAR studied the EEG of patients who underwent examination in stationary conditions. All the subjects reached the age of majority and have given grateful evidences on the fact of committing criminal acts (Table 1). Patients were subjected to standard implementation methodology of EEG with electrode placement according to the international system “10-20%” and the ipsilateral ear electrodes. Test with hyperventilation was performed by the standard method with the dispersion assessment of the changes of apha- rhythm method SV Rosman [5]. DAFCAR parameters were calculated by the method of SV Rosman 2013 using the programs Microsoft Excel and Statistica 10.0 [6]. A critical reader may ask, whether all these statistics are the result of the pathology, which was established in these patients by a panel of experts? In this case the pathological changes are attributed to the group of patients who were deemed mentally healthy. To study this question, a comparative analysis of average values of indices DAFCAR in persons with pedophilia, but recognized healthy.

Table 1: Distribution of patients by age and diagnostic groups according to the results of a psychiatric examination in comparative experiment study on DAFCAR patients with pedophilia.

| Expert diagnosis                          | Number | Age       |
|-------------------------------------------|--------|-----------|
| F02.8 Dementia in other diseases          | 3      | 65.7±5.6  |
| F07 Organic brain disease                 | 9      | 45.8±4.2  |
| F10 Alcoholism                            | 5      | 44.4±4.4  |
| F6 personality Disorder, including sexual perversions | 4      | 36±3.8    |
| F20 Schizophrenia                         | 4      | 49.5±3.5  |
| F70-71 Mental retardation                 | 13     | 26.8±3.5  |
| Mental health (PPhT)                      | 15     | 43.2±4.1  |
| TOTAL                                     | 53     | 40.9±3.9  |

Results: (Figures 1-5).

Conclusion

Assessment of the dispersion of comparative maps leads us to believe that, in General, cartograms patients with pedophilia is close to the base of PRL, however, differ from the last large value O f Mo - F Mo, i.e., greater severity of functional hypofrontality and thus occupies an intermediate position between BPD and DSch (Figures 1 & 2), with stratification cartogram close to the PD. DAFCAR indices have the same trend, which is clearly seen not only according to the summary Table 2 but, especially, according to the comparative histograms (Figure 3).

Table 2: Summary data for the comparative analysis of indexes DAFCAR with various mental diseases.

| Hemi sphere  | Index | Health | PD | BS | BPD | PPhT | DSch |
|--------------|-------|--------|----|----|-----|------|------|
|              |       | Sr. značenie Dover.interval | Sr. značenie Dover.interval | Sr. značenie Dover.interval | Sr. značenie Dover.interval | Sr. značenie Dover.interval | Sr. značenie Dover.interval |
| Left         | O Mo f | 10.25  | 10.05  | 10.13 | 9.78 | 9.83 | 9.9  |
|              |       | 10.12-10.4 | 9.91-10.19 | 9.92-10.35 | 9.56-10.01 | 9.52-10.14 | 9.71-10.1 |
|              | FMo f | 10.26  | 10.05  | 10.05 | 9.27 | 8.81 | 9.01 |
|              |       | 10.12-10.41 | 9.85-10.14 | 9.82-10.28 | 9.95 | 8.54-9.07 | 8.73-9.29 |
|              | O Mo f - FMo f | -0.03 | 0.05 | 0.08 | 0.52 | 1.02 | 0.89 |
|              |       | 0.01-0.1 | 0.01-0.15 | 0.25-0.78 | 0.68-1.37 | 0.6-1.18 |
|              | CDa1  | 0.284  | 0.237  | 0.287 | 0.205 | 0.2  | 0.169 |
|              |       | 0.274-0.294 | 0.221-0.253 | 0.265-0.308 | 0.18-0.23 | 0.169-0.23 | 0.149-0.19 |
|              | CDa2  | 0.745  | 0.66   | 0.741 | 0.573 | 0.54 | 0.509 |
|              |       | 0.727-0.762 | 0.634-0.686 | 0.717-0.766 | 0.528-0.618 | 0.487-0.594 | 0.468-0.55 |
|              | IIDA  | 6.895  | 5.205  | 7.1  | 4.054 | 3.899 | 3.284 |
|              |       | 6.359-7.431 | 4.536-5.873 | 6.176-8.025 | 2.933-5.175 | 2.742-5.056 | 2.388-4.181 |
|              | ADA   | 2.657  | 2.29   | 2.67 | 1.948 | 1.856 | 1.746 |
|              |       | 2.572-2.741 | 2.166-2.414 | 2.525-2.815 | 1.721-2.175 | 1.597-2.114 | 1.543-1.949 |
|            | CDa1 F | CDa2 F | IHH | AH | Alpha-1/Alpha | Alpha-2/Alpha | Alpha-3/Alpha | IZ | Age | O Mof | FMof | O Mof - F Mof | CDa1 | CDa2 | IID | ADA | CDa1 F | CDa2 F | IHH | AH | Alpha-1/Alpha | Alpha-2/Alpha | Alpha-3/Alpha |
|------------|--------|--------|-----|----|-------------|--------------|--------------|----|-----|-------|------|--------------|------|------|-----|-----|--------|--------|-----|----|-------------|--------------|--------------|
|            | 0.23   | 0.19   | 0.252       | 0.155       | 0.16         | 0.127         | 0.216-0.243 | 0.173-0.207 | 0.233-0.272 | 0.136-0.175 | 0.135-0.186 | 0.112-0.141 | 0.623 | 0.529 | 0.648 | 0.449       | 0.444       | 0.389         | 0.597-0.649 | 0.499-0.559 | 0.616-0.68 | 0.411-0.487 | 0.396-0.492 | 0.355-0.423 | 6.534 | 4.458 | 7.271 | 3.053 | 3.079 | 1.955 | 5.925-7.144 | 3.693-5.224 | 6.424-8.117 | 2.106-4 | 1.968-4.19 | 1.146-2.764 |
|            | 0.242-2.656 | 1.825-2.171 | 2.519-2.816 | 1.393-1.833 | 1.535-1.871 | 1.091-1.507 | 0.129 | 0.188 | 0.124 | 0.294 | 0.322 | 0.301 | 0.118-0.141 | 0.162-0.213 | 0.108-0.14 | 0.252-0.335 | 0.275-0.368 | 0.27-0.331 | 0.773 | 0.703 | 0.755 | 0.593 | 0.561 | 0.583 | 0.737-0.808 | 0.674-0.732 | 0.7-0.81 | 0.548-0.638 | 0.513-0.61 | 0.545-0.62 | 0.134 | 0.152 | 0.137 | 0.141 | 0.145 | 0.145 | 0.09-0.178 | 0.123-0.181 | 0.08-0.195 | 0.112-0.17 | 0.114-0.176 | 0.123-0.167 | 0.148 | 0.157 | 0.131 | 0.129 | 0.109 | 0.143 | 0.121-0.176 | 0.128-0.185 | 0.089-0.173 | 0.097-0.161 | 0.067-0.152 | 0.11-0.176 | 21.5 | 22.9 | 28.2 | 29.7 | 40.9 | 27.1 | 20-23 | 21.6-24.2 | 26.8-29.6 | 28.7-30.8 | 36.8-45.1 | 25-29.1 | 10.25 | 10.02 | 10.04 | 9.65 | 9.64 | 9.8 | 10.1-10.39 | 9.88-10.16 | 9.8-10.27 | 9.44-9.87 | 9.36-9.92 | 9.6-9.99 | 10.26 | 9.93 | 9.93 | 9.37 | 8.92 | 8.94 | 10.12-10.4 | 9.79-10.08 | 9.68-10.19 | 9.1-9.64 | 8.67-9.17 | 8.69-9.19 | 0.02 | 0.08 | 0.1 | 0.29 | 0.72 | 0.86 | 0.05-0.01 | 0.02-0.15 | 0.03-0.17 | 0.09-0.48 | 0.39-1.05 | 0.57-1.14 | 0.296 | 0.247 | 0.282 | 0.215 | 0.199 | 0.172 | 0.284-0.307 | 0.23-0.264 | 0.26-0.304 | 0.192-0.239 | 0.17-0.228 | 0.151-0.193 | 0.767 | 0.669 | 0.733 | 0.586 | 0.538 | 0.516 | 0.749-0.785 | 0.641-0.697 | 0.7-0.766 | 0.544-0.627 | 0.485-0.591 | 0.474-0.558 | 7.137 | 5.502 | 6.901 | 4.76 | 4.039 | 3.254 | 6.563-7.711 | 4.816-6.187 | 5.942-7.86 | 3.743-5.778 | 2.857-5.22 | 2.287-4.22 | 2.706 | 2.324 | 2.617 | 2.102 | 1.897 | 1.713 | 2.615-2.798 | 2.184-2.464 | 2.458-2.776 | 1.891-2.313 | 1.634-2.16 | 1.481-1.945 | 0.23 | 0.191 | 0.249 | 0.155 | 0.16 | 0.121 | 0.215-0.244 | 0.174-0.208 | 0.231-0.266 | 0.135-0.175 | 0.134-0.185 | 0.107-0.135 | 0.625 | 0.535 | 0.645 | 0.449 | 0.441 | 0.377 | 0.598-0.653 | 0.506-0.564 | 0.617-0.673 | 0.411-0.487 | 0.393-0.49 | 0.344-0.41 | 6.194 | 4.498 | 7.319 | 2.951 | 2.909 | 1.579 | 5.521-6.868 | 3.729-5.266 | 6.569-8.069 | 1.977-3.924 | 1.8-4.019 | 0.746-2.412 | 2.479 | 2.024 | 2.684 | 1.584 | 1.584 | 1.162 | 2.348-2.61 | 1.858-2.191 | 2.56-2.808 | 1.355-1.813 | 1.331-1.838 | 0.937-1.387 | 0.112 | 0.178 | 0.119 | 0.284 | 0.32 | 0.297 | 0.101-0.123 | 0.152-0.205 | 0.1-0.138 | 0.239-0.328 | 0.273-0.367 | 0.266-0.327 | 0.793 | 0.719 | 0.761 | 0.605 | 0.558 | 0.582 | 0.756-0.83 | 0.689-0.749 | 0.706-0.816 | 0.558-0.652 | 0.519-0.607 | 0.543-0.622 | 0.095 | 0.103 | 0.105 | 0.111 | 0.121 | 0.121 | 0.056-0.133 | 0.082-0.124 | 0.048-0.161 | 0.086-0.137 | 0.092-0.151 | 0.099-0.143 |
| IZ       | 0.241       | 0.217       | 0.215       | 0.178       | 0.137       | 0.178       |
|----------|-------------|-------------|-------------|-------------|-------------|-------------|
| Age      | 21.5        | 22.9        | 28.2        | 29.7        | 40.9        | 27.1        |
|          | 20-23       | 21.6-24.2   | 26.8-29.6   | 28.7-30.8   | 36.8-45.1   | 25-29.1     |

**Figure 1:** Average dispersion index of the alpha rhythm at PPh (T, H). A, B - cartogram according PPhT. C, D - cartograms group PPhH. A, C - left hemisphere, B, D for the right hemisphere. Here and below, the horizontal axis is the frequency of the alpha rhythm, Hz, vertical axis - leads of the EEG.

**Figure 2:** Comparative average dispersion diagrams of the alpha rhythm in some types of psychopathology: A - normal, B - PD, C - BS, D - BPD, E - PPhT, F - DSch.
Figure 3: Comparative histograms of index values DAFCAR with various mental diseases: 1 - Health, 2 – PD, 3 – BS, 4 – BPD, 5 – PPhT, 6 – DSch
The statistical validity of these changes in the test checked student represented Lena in Tables 3 & 4. In general, we can say that the PPhT group, with statistically significant differences from the norm and personality disorder, not very different from BPD and DSch [7-10]. Quite illustrative are the results of HVT (Figure 4). With PPhT and PPhH we observed abnormally high levels of endogenous reactions, at least twice the level in the personality disorder, even among healthy recognized pedophiles. The level of the PPhT total even higher than at the onset of schizophrenia, but we should not forget that in the group DSch all patients were intensively treated with neuroleptics, and in the PPhT group as there are people with schizophrenia, and during the survey period, they intensively were not treated. From the studies presented in the previous articles in this series, it can be concluded that the endogenous reaction is a kind of constitutional state MSGM in which it is not sufficiently resistant to stress factors: brain cells, instead of synchronizing their activities in normal conditions (neutral reaction, exogenous reaction) on the contrary, desynchronizing her, which is manifested by increase of dispersion of the alpha rhythm. It is possible that the property is hereditary, and it is transmitted as a genetic predisposition to schizophrenia [11].

![Figure 4](image_url)

**Figure 4:** The results of the hyperventilation test (HVT) for different types of psychopathology.

**Table 3:** Statistical significance of differences between the average values of indices of dispersion DAFCAR in different groups of patients according to Student’s test (t-value), a group of PPhT (filtered data represented only statistically significant differences).

|                 | Mean PPhT | Mean Health | t-value | df  | p      |
|-----------------|-----------|-------------|---------|-----|--------|
| Alpha-1/Alpha   | 0.321     | 0.121       | 12.548  | 225 | <0.001 |
| Alpha-2/Alpha   | 0.560     | 0.783       | -10.591 | 225 | <0.001 |
| CDa1            | 0.199     | 0.289       | -8.487  | 225 | <0.001 |
| CDa2            | 0.539     | 0.756       | -11.519 | 225 | <0.001 |
| IIDA            | 3.969     | 7.015       | -6.969  | 225 | <0.001 |
| ADA             | 1.877     | 2.681       | -8.768  | 225 | <0.001 |
| CDa1 F          | 0.160     | 0.230       | -7.038  | 225 | <0.001 |
| CDa2 F          | 0.443     | 0.624       | -9.638  | 225 | <0.001 |
| IIH             | 2.994     | 6.366       | -7.709  | 225 | <0.001 |
| AH              | 1.598     | 2.510       | -9.482  | 225 | <0.001 |
| O Mo f          | 9.736     | 10.250      | -4.567  | 225 | <0.001 |
| F Mo f          | 8.863     | 10.262      | -14.055 | 225 | <0.001 |
### Table 4: Statistical significance of differences between the average values of the indices DAFCAR in different groups of patients according to Student’s test (t-value), group PPhH (filtered data represented only statistically significant differences).

| Mean | Mean | t-value | df | p     |
|------|------|---------|----|-------|
| Alpha-1/Alpha | 0.279 | 0.129 | 7.573 | 74 | p<0.001 |
Thoughtful interpretation of these data should lead us to some very important conclusions. A general slowing of the alpha rhythm leads to cognitive impairment - mental retardation and dementia; regional slowdown (particularly in the frontal lobes) - mostly behavioral (schizophrenia). A series of articles dedicated to DACHER demonstrates that at the core of all psychopathological changes - from the most innocent to deep delusional dementia is the disruption of the NGNB of varying severity and localization. This allows us to make a reasonable conclusion that as the cause of mental illness acts as a functional-informational etiologic factor (FIEF). FIEF disrupt the processing of afferent information and prevents the formation of the appropriate efferent response, which is the essence of psychopathology. Hence it is quite logical to conclude that there is a whole class of information of the disease, the etiological cause of which is FIEF. In the first instance to information diseases include mental illness. Key to this concept is the notion that the etiological factor is not necessarily embodied in morphological changes in tissues and organs. In cases of information of the disease as such can be functional disorganization of the management structure. In cases of psychopathology is the entropy NGNB. In the case of pedophilia, we deal with such information a disease in which result from the effects of FIEF NGNB is formed on inadequate existing conditions of society a model of sexual behavior. They
have no intent to commit a crime because of their pathologically changed brain does not see this behavior nothing wrong. In the framework of the theory “a single psychotic” pedophilia in its neurophysiological parameters change NGNB may be related to schizotypal disorder (F21) or sluggish schizophrenia (Figure 5).

Figure 5: Place pedophilia on “axis of dementia ” in the framework of the theory of “a single psychotic”. BS -burnout [9], BPD - borderline personality disorder [7], PPh - pedophilia.

Conclusion

a) Entropy of NGNB is the functional-informational etiologic factor (FIEF) information diseases - primarily mental illness.

b) Information diseases - diseases in which interfere with the normal managerial function of the body due to incorrect processing of afferent information and formulating efferent inadequate response.

c) DAFCAR is a fairly sensitive marker FIEF that allows for early information to diagnose disease.

d) Pedophilia is an informational disease in which distorted moral assessment of sexual behavior due to the disorganization NGNB in the frontal lobes; in the framework of the existing classification ICD-10 it belongs to schizotypal disorders (F21), or latent schizophrenia.

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