



## THE FORENSIC IMPORTANCE OF HANDWRITING PATHOLOGY IN MAJOR PSYCHIATRIC DISORDERS

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### **Abstract**

*There has always been a fascination for investigating the mental illness; the explanation lies in the difficulty of finding the causes that generated the disease and also in providing the proper medical treatment for stopping its evolution and eventually curing the patient. This case study intends to highlight the importance of handwriting in providing additional information for criminal investigators when it is possible to find handwritten evidence at the crime scene or samples from the suspect(s). Handwriting analysis can also be turned into a medical diagnosis evaluator for monitoring the patients from psychiatric clinics; the conclusions reveal the characteristics of damaged handwriting due to psychiatric disorders.*

**Keywords:** *handwriting analysis, depressive syndrome, schizophrenia, disconnected handwriting, descendent baseline, letter form quality*

### **Introductory notes**

The incidence of mental illness has increased dramatically. Romanian specialists' studies find that in our country, in terms of incidence related to mental disorders, the depressive syndrome occurs mostly at the city, while the alcohol dependence represents the biggest problem in countryside zones.

Besides these, other psychiatric conditions frequently encountered are: hallucinogenic substance abuse related disorders, anxiety, personality disorders and post-traumatic stress.

The same study shows that there are specific mental illness generated especially by genetic factors; schizophrenia, for example, is genetically determined in proportion of 70-75%, while the depressive syndrome is hereditary in only 40-50% of cases. In Forensics, the importance of identifying a disease can be helpful to criminal

investigation; in practice, we have found numerous cases in which suicidal people without being in evidence of a doctor as having psychiatric disorders, have left letters (handwritten) in order to explain their extreme gestures.

Without a written document medically stating that the person was suffering from certain mental disorders, handwriting analysis of such letters may explain the extreme gesture committed as a result of the disease from which he was suffering, excluding the option of a murder disguised as suicide. Another case in which pathology of writing is important for the forensic field is the one related to the anonymous letters threat or blackmail, when the discovery of a disease can guide the criminal investigation, providing new leads for the police into identifying the author.

Sometimes, justice turns to experts in handwriting in cases of

prisoners or criminals trying to determine trends, motivations and temperament, handwriting analysis will be therefore an additional factor which will confirm or invalidate the psychologists' or psychiatrics' diagnosis.

Handwriting studies will help the psychiatrist to observe such improvements or worsening of health status of patients based on correlations between graphical forms and the evolution of existing diseases. This correlation is based on the physiological mechanism of writing.

In terms of neuropsychology, writing is the result of interoperable links occurred on three levels: motor, perception and representation and affective. It is to understand the link between motion control and visual, kinesthetic control is the visual movement and the path graph, uniting the two movements, leading to visual anticipation and then the visual representation. The second plan lies between the temporal organization and the tempo-spatial one, while the third plan mentioned links that makes the transition from oral expression to the graphics.

During time, studies of handwriting have been made, concerning various diseases (including neurological and psychological), giving birth to a new discipline called graphopathology. Thus, according to various functional and organic abnormalities that can be installed, the writing disorders can be classified into the following categories<sup>i</sup>: writing rhythm (increased rhythm or *graphorrhoea*, vs. low rate); graphic morphology disorders (micrography, macrography, seismic handwriting),

impaired semantic graphical forms (Schizophrenia handwriting, hermetic writing, doodles).

Along with the contribution of Crepieux Jamin on the classification of writing types – which had inspired and helped the future studies which were conducted in graphopathology, we also remember psychiatrist Dr. Winslow who in 1895 published his studies in the chapter "*Handwriting of the Insane*" from the book "*Mad Humanity: Its forms apparent and obscure*". Other relevant studies related to Alzheimer disease were made by Behrendt<sup>ii</sup>, Diaz Dononso<sup>iii</sup> and Bernard Croisic<sup>iv</sup>. Mc Lennan, Nakano, Tyler and Schwab<sup>v</sup> were concerned with studying the effects of Parkinson disease on writing.

Another condition that requires significant changes in writing is schizophrenia, one of the most important studies is the one of Private<sup>vi</sup> who tried to find the "graphic syndrome" of the disease - the author manages to highlight the creationist aspect, mechanical, impersonal: the first thing that strikes when analyzing such handwriting is not the general imbalance of the writing, but his constant dull evoking a personality whose profound dynamism is low.

In Romania, graphic disturbance symptoms were treated by Andrei Prof.Dr. Athanasiu, and forensic expert Radu Constantin ; other Romanian personalities who were concerned with handwriting analysis were Vaschide V. Gheorghe Marinescu, IC Parhon, M. Derevici and H. Bogdanovich.

## Theoretical Background

There have been established many different types of research in writing. These are classified as: descriptive, comparative and experimental methods.

**The descriptive methods** are focusing on certain characteristics of writing that are considered significant in determining the individual characteristics of the people giving handwriting samples. Significant signs are: pressure, firmness, clarity of letters and connecting strokes, the writing on the page and line, size points (constancy or variation thereof), form letters, continuity and slope points, spaces between lines and letters, etc. The characteristics listed above highlight the typological features (Strength, mobility), psychosomatic features, mental (sensitivity, accuracy, aesthetic sense, will, intelligence, creativity) and even tensed trends, depression, vitality.

**The comparative methods** refer to larger and different population samples in order to highlight specific characteristics of age, gender, normality, the level of culture, reflected in writing. Due to this kind of studies there have been revealed important techniques for handwriting analysis.

**Experimental methods** refer to tests requiring, among other things, to write fast, slow, big, small, beautiful, spontaneous, etc.. Writings were performed under hypnotic influence or suggestive command. There are several methods of this type that have been used mostly in legal identifications, to identify cases of counterfeit writing, etc. It performs such experiments, as for example, comparing the writing to the temperaments, intelligence or other

similar or different psychological characteristics. There are, of course, exceptional people, and exceptional handwriting. In both cases experts have used experimental and comparative methods.

## Materials and Methods

Our study is based on the writing research of patients suffering from depressive syndrome and Schizophrenia; it has been performed in "Titan-Dr. Constantin Gorgos" Hospital, Department of Psychiatry, and consisted in obtaining handwriting samples from hospitalized patients.

Five samples were obtained in total, four from patients having depressive syndrome and one from a patient diagnosed with schizoaffective disorder.

Age group of patients ranged between 26 and 80 years, while their professional preparation was between 4 and 12 classes.

The 5 patients were asked each to copy the same piece of text on a white A4 sheet, the samples will be initially analyzed separately by following the descriptive method and then compared in order to establish the similarities and differences.

The study group consisted of people with the following disorders: depressive syndrome and *schizoaffective disorder (-schizophrenia and bipolar disorder)*.

These conditions have the following psychiatric features:

**The depressive syndrome** is characterized by a transient decrease or sustainable mental component showing

significant changes in both physical and somatic and in the psycho-emotional.

The patient has low activity, limited gestures, looking sad and dull, charges a constant state of fatigue, insomnia, and neurovegetative disorders (weight loss, anorexia, constipation, hypotension, etc.).

In terms of psycho-affective characteristics, depression causes : fatigue, decreased intellectual performance, attention and memory difficulties, fatigue, weakness of will, sadness, sleep disturbances, restlessness anxiety, pessimism, difficulty in thinking, suicidal, etc.

**Bipolar Syndrome (manic-depression)** is characterized by alternating in time depression with anger.

**Schizophrenia** is a complex disorder in which discordant, incoherent speaking, ambivalence, autism, delusions, hallucinations poorly systematized, deep affective disorder in the sense of detachment, alienation of feelings, disorders that tend to move towards deficit and dissociative personality dominate<sup>vii</sup>.

Statistics made on patients older than 15 years old, show that the incidence of schizophrenia is estimated to be between 0.030% -0.120% per year.

Developed countries seem to have higher rates than poor ones.

American scientists say that higher rates occur also in sub-cultural

groups. European authors show an annual incidence of 0.1-0.5 per 1000 inhabitants; in our country it is estimated at 0.5-1.5 per 1000 inhabitants.<sup>viii</sup>

**Handwriting analysis on a hospitalized patient with depressive syndrome due to alcohol**

Handwriting featuring interrupted motion graphics (1) with angular tendencies trail both in the lower loops (2) and in the strokes connection between letters (3).

Messy text on the layout of the left edge lies in volatility (oscillating between 31 and 36 mm) and in overcoming the paper surface in the right edge, continuity is altered by frequent interruptions, replays, and smearing corrections (4). Text abounds in miss coordination (5) of graphics movements, achieving failures of the attack points in the formation of letters, the subject performs multiple lifting of the scriptural instrument from the sheet of paper. Due to poor professional training of the subject (vocational school) mistakes related to spelling abound, there are no dashes, the diacritics and the punctuation are missing. In terms of size, the tiny oval varies between 3 and 5 mm - writing fits in the category of medium size. Pressure is average, while the base line presents swings, having a meandering shape. Writing is inclined (approx. 70 degrees to the left) but some letters show a stronger inclination even within the same word (6).

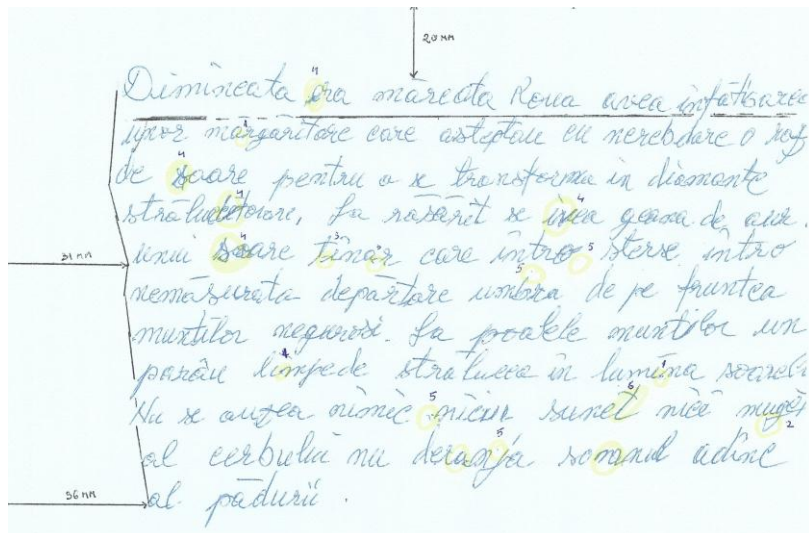


Figure.1 Male, 58 years old, depressive syndrome due to alcohol, graduated the vocational school

**Depressed patient, 55 years old, female**

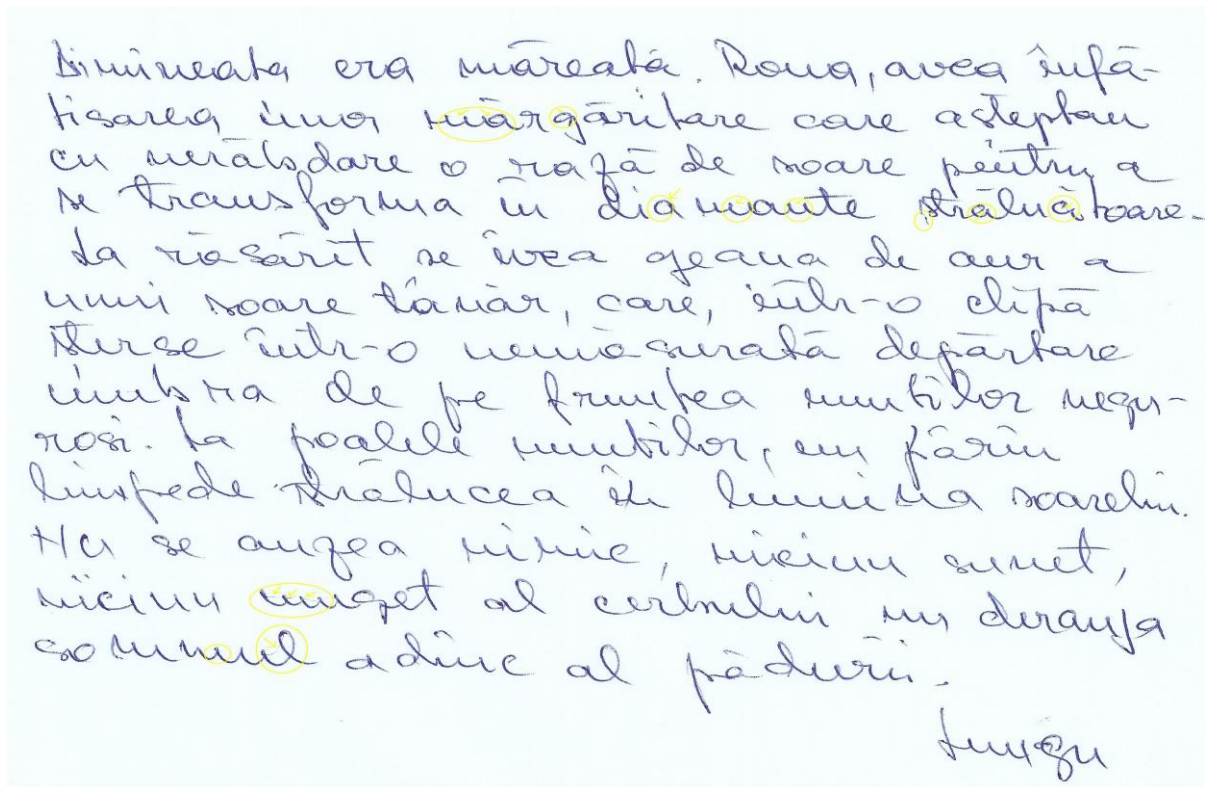
Reclined slant (to the left), with narrow right margin - the left margin of the sheet oscillates between 23 to 29 mm.

Writing is in the average evolution, despite the graduation of only 10 school classes.

She's the only patient who notices the new lexical-grammatical rules of writing according to "DOOM 2 Dictionary -Romanian language") and

although she contested it, agrees to use them. In terms of connection between the letters, the connected writing prevails (constant interruption of the writing movement alternating with the connecting strokes).

Pressure decreases as subject finished writing, so the writing becomes progressively larger.



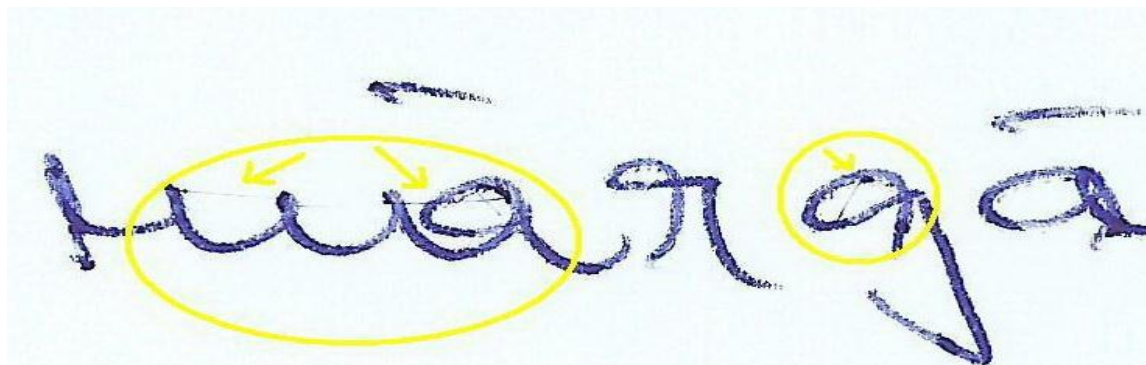
Limineata era măreată. Roua, avea înfă-  
țisarea unei mărgăritare care aștepta  
cu nerăbdare o rază de soare pentru a  
se transforma în diadante strălucitoare.  
La răsărit se ivea geana de aur a  
unii soare tânăr, care, într-o clipă  
terse într-o nemăsurată depărtare  
umbra de pe fruntea nimbilor negu-  
roși. La poalele nimbilor, un fărâș  
limpede strălucea în lumina soarelui.  
Nu se auzea nimic, niciun sunet,  
niciun cunștut al cerbului, nu dăduse  
cununel adine al pădurii.

Luzon

**Figure.2** 55 years old female, depression

She's the only subject that performs a signature after the end of the text, placing the signature in the extreme right side of the page. The signature presents a falling baseline, medium size and pressure, so there is identity between this and the rest of the copy text.

Writing presents an abundance of fine features, lightly occurred when reaching the paper with a writing instrument, a kind of so-called "spider wire"<sup>ix</sup> specific to the elderly, although, in this case, the subject has only 55 years old.



**Fig.2.1** The "spider wire" seen in handwriting

**Descriptive method on a 26 years old patient (12 classes) with schizoaffective disorders**

The subject manifests euphoria, handwriting debuts with large ovals (1) of 3-4 mm.

Gradually, writing will reduce its size, lack of energy increases as the subject finished writing.

Thus, the end of the text will show half sized ovals (3) (from 1.5 to 2 mm).

Pressure will follow the same trend as for size; writing begins with a normal pressure, which did not remain constant throughout the writing.

In terms of placement on the page, the margins are irregular, expressing affective instability, sensitivity and contradictory attitudes.

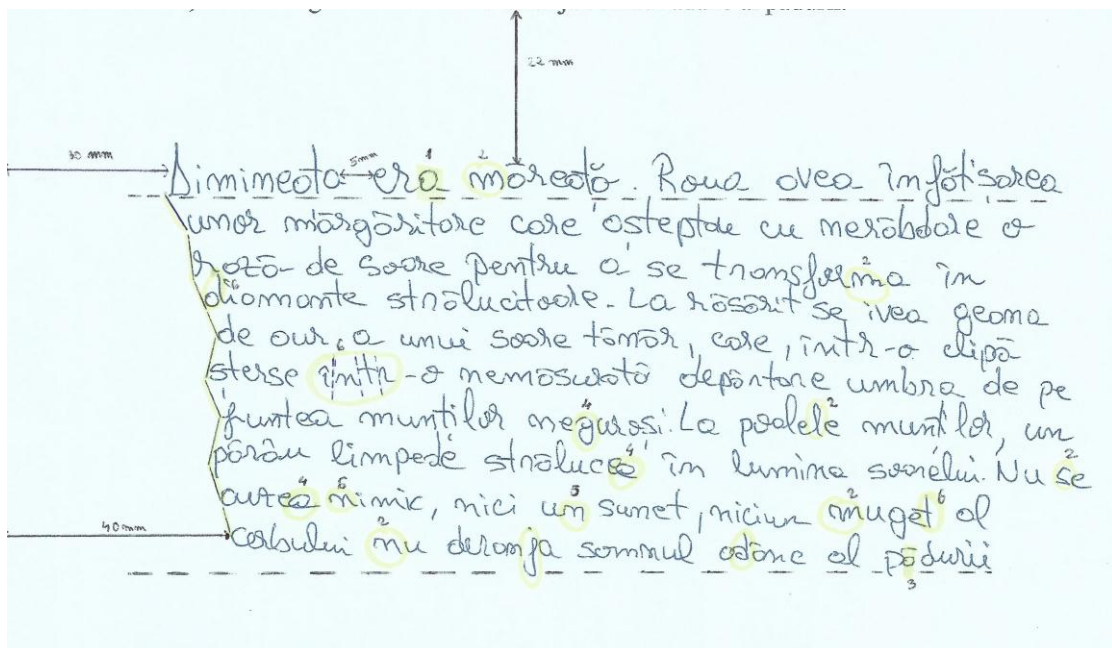
Mental oscillations are reflected accurately in terms of writing direction; graphic gestures are turning left (4) while the row line is winding and descending, the words "falling down" (5).

The writing slant oscillates - writing is generally vertical (approx. 90 degrees), but there are situations where letters are reclined - to the left (6).

This translates into the existence of two contradictory tendencies, the subject oscillates between introversion-extraversion<sup>x</sup>.

Writing manifests slowness, as the connectedness between letters fits in the juxtaposed type; same contradiction mentioned in the previous paragraph is explained by Professor A. Athanasiu - disconnected graphic forms are always indicating unbound antinomies, contradictions between the two theses that mutually exclude.

Permanent tremor of the lines (2) is a result of antidepressant medication given to the subject.



**Figure.3** 26 years old female, schizoaffective

### Patient suffering from depression

Disorganized typical handwriting for a 72 years old person. The graphic forms are damaged; the writer's handwriting is marked by the inability to "attack" some letters which results in failures of forming the desired letters.

Literal forms are simplified to the maximum, returning to the calligraphically model learned from school. Writing is undeveloped, with missing hyphens, punctuation mistakes abounding due to the subject's poor training of only 4 primary classes.

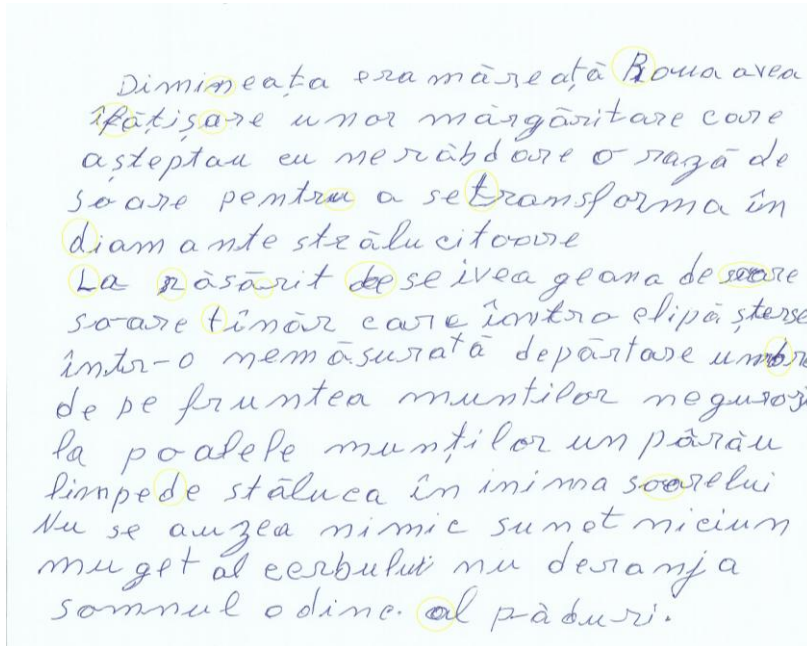


Figure 4. 72 years old female, depression

Features of the connection between letters disappear or are represented by lines, each letter being written separately, without any connection with the nearby letters - typical for the "chopped" writing (-meaning totally disconnected writing type).

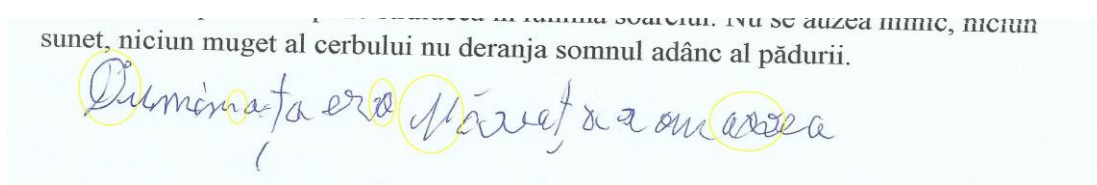
Pressure is very high; we observe that the subject lacks energy, and so the range of time in which the text was copied is triple than normal- aspect due also to the reduced continuity of writing. In terms of text position, no left or right margins are respected by the writer when

copying the text on the sheet of paper. The upper loops are affected by tremor.

### 80 years old patient suffering from depression (E)

As for the 80 years old patient, she could not copy more than one sentence of the text, complaining of side effects of medication received. Writing it is more disorganized as the previous one, missing letters and words; we notice that one of the words inside the sentence is capitalized. 90% of her words (4 words out of 5) present failures and damaged graphic forms.





**Figure 5.** Female, 80 years old - depression

## Discussion

The descriptive methods applied to the five writing samples revealed the negative aspects of writing, typical for people with mental illness.

All these writings reveal problems of letter forming – either difficulties in letters' formation or simply writing in a faulty manner (we refer here to twisting, orientation to the left, etc.).

The handwriting of any mentally stable person is characterized by constant inclination of writing, a medium pressure and a normal energy (-if the handwriting analysis highlights situations in which upper areas are extended (overdeveloped) we will find a surplus of energy of the subject, faulty power management causing the psychically existence of certain pathological disorders - such as maniac outcomes, etc.).

Baseline must be parallel to the bottom of the paper – in our samples, the writing we have analyzed presents in 100% of cases descending or sinuous baselines.

In our analysis, we must take into account the fact that subjects have been

taken antidepressants, the man suffering from alcoholic depression being the only one who wasn't under medication at the time of writing.

So, 80% of the written present sluggish graphics, writing pressure gradually decreasing.

The incidence of chopped writing (fragmented) may explain the subjects' problems on development of correlations between different situations, events, knowing that connected writing involves the existence of an analogical reasoning type of a subject with such writing, and the "Chopped" one – the intuitive type.

Also must be remembered, in our analysis, that most of the subjects' writing deterioration due to old age combines with the pathological causes; interesting case is the one of the 55 years' old patient who presents "spider wires" - a specific handwriting deterioration of older persons.

In all cases the writing is undeveloped, maintaining the aspects of the calligraphic model learned in the elementary school, spelling mistakes abounded due to the poor education of the subjects.

## Conclusions

After implementing the study, we discover lines for our further research. It is useful to choose a proper segment of

patients in order to achieve less statistical errors and, for greater clarity of the comparative analysis, samples of writing should come from patients suffering from

a single mental illness. In our future studies it is necessary to include patients with higher education level to see whether an evolved handwriting deteriorates faster than an undeveloped one, given that many physical processes

are involved when the writing is evolved (subject passing through many educational institutions and choosing different professions who will undoubtedly make their mark on their psyche).

### **Acknowledgment**

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