

Fundamental ideas and specific features of identification by handwriting analysis

Idei fundamentale și particularități specifice privind identificarea grafoscopica

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Abstract: The process of graphoscopic identification, although seemingly simple at the first glance, usually in particular situation encountered in practice is clearly one of the most difficult in the field of forensic sciences, primarily due to the paramount importance of the dynamics reflected by the graphical paths in analysis and interpretation of the complexity of traces („of a very certain specific” L. Ionescu) represented by handwriting. The paper systematizes and analyzes ideas, but also particular issues that focus on the scientific foundations of identifying the person by handwriting analysis (including the signatures as a variety of handwriting), given a number of specific essentials that are often not understood or which are superficially understood by people who are interested in the conclusions of a graphoscopic expertise.

Keywords: forensic examination of documents, handwriting, signatures, individualizing potential, specific interpretation, graphoscopic identification, authentication

Rezumat: Procesul identificării grafoscopice, aparent simplu la prima vedere, de regulă în situațiile concrete întâlnite în practică este unul dintre cele mai dificile din sfera de cuprindere a științelor forensic, în primul rând ca urmare a importanței primordiale pe care o are dinamica reflectată de traseele grafice în analiza și interpretarea complexului de urme („...de un gen cu totul aparte” L. Ionescu) reprezentat de scrisul de mână. În lucrarea de față sunt sistematizate și analizate idei, dar și probleme particulare care se axează pe fundamentele științifice ale identificării persoanei după scrisul olograf (incluzând și semnătura ca specie a scrisului), având în vedere o serie de aspecte specifice esențiale, care de multe ori nu sunt înțelese sau sunt înțelese superficial de către persoanele care sunt interesate de concluziile unei

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expertize criminalistice sau care în diferite împrejurări vin în contact cu diverse documente sau alte suporturi conținând mostre de scris olograf ori semnături.

Cuvinte-cheie: expertiza criminalistică a documentelor, scris olograf, semnătură, potențial individualizator, interpretare specifică, identificare grafoscopică, autentificare

1. Introduction

Graphoscopy finds its utility in a wide range of situations³, from the usual civil or criminal cases in which it is necessary to authenticate documents or just identify the author of a letter or signature on a particular medium, to the cases where a multidisciplinary analysis of documents or other types of objects that can support handwriting (of cultural and historical value), the expertise of autographs to determine the value of the collectibles on which it is located in the event of an auction or other type of transaction and ending with the expertise of writing and signatures on certain objects of purely sentimental value.

2. The notion of handwriting. The scientific basis of graphoscopic identification.

Writing (handwriting in this case) can be defined as a complex process in which a certain system of conventional graphic signs is used in order to represent ideas or states and feelings, or of some of the most diverse elements and aspects of objective or subjective reality. Signature is a kind of handwriting.

When expressing the idea that handwriting as a means of identification is not limited to alphabetical writing but encompasses all forms of graphic manifestation of a person⁴, Lucian Ionescu is of the opinion that even the features of a drawing can be the object of an identification, with the mention that the compared drawings should preferably come from the same period, because the way a painter draws can change from one period of creativity to another.⁵

³ One of the examples that has been written in the international press is that of the members of The Beatles (John Lennon, Paul McCartney, George Harrison and Ringo Starr), claiming that at least two of the four artists falsified the signatures of their colleagues in different circumstances of the band for noble purposes or who fully excuses the "gesture" (one of the cases being that of a teenage girl suffering from end-stage leukemia and who wanted a photo signed by her favorite band, made George Harrison hurry to send the photo and sign in the place of his colleagues).

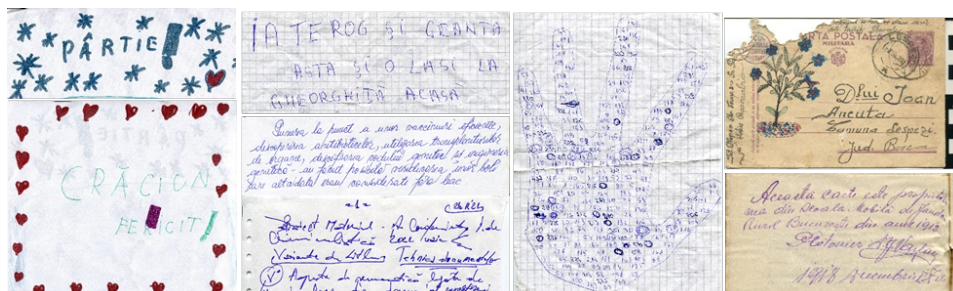
⁴ See the case of the letter composed almost entirely of drawings, "translated" by the writer Gesualdo Bufalino and published in his book "La luce e il luto".

⁵ L. Ionescu, *Expertiza criminalistică a scrisului (Forensic writing expertise)* – Junimea Publishing House, Iași 1973, p. 19.

Studies and practice in the field of graphoscopy have confirmed the two fundamental properties of handwriting, being considered axioms which have been accepted and used for hundreds of years, namely:

a. No two people can write exactly the same (individuality of handwriting⁶);

b. The writings of all people show a natural variability (relative stability).



Pic no.1. Writing samples made in conditions of spontaneity and naturalness, in a wide range of circumstances, by people in different stages of evolution of specific skills - the mixture of handwriting and naive graphic art is noticeable in some situations

Image source: authors' personal collections.

Starting from the idea with a general sphere of incidence and validity, also with axiomatic value, the content of which is reduced to the statement that any object or being is identical only with itself, we arrive at the complex process underlying writing, it materializes (in principle through the use of an instrument and a support) through movement - which is *the final link in a reflex act* (I.P. Pavlov). Thus, taking into account the fact that the essence of "movement" is related to the coordination provided by the nervous system (seen as a central pillar of the psychosomatic structure of the human person from a functional point of view), to which there are added a number of general aspects and especially a series of characteristic physical and mental characteristics, but also the fact that handwriting (seen as one of the concrete ways in which the movement materializes) consistently reflects a large part of the endogenous and exogenous factors involved, the individuality of handwriting cannot be the subject of debate or contradictory discussions, being inextricably linked to the uniqueness of the human being.

Handwriting is based on specific skills⁷, in which the physiological mechanism is driven by the complex of temporary nerve connections or

⁶ "The signs of a writing give us a graphic imprint that unifies us" - Girolamo Moretti.

conditioned reflexes. The connections produced in the cortex are associated with various motor acts of the hand - driven and controlled by the central nervous system. „The particularities of the type of nervous activity specific to each person are complemented by all kinds of teachings, cultural, professional, technical, family influences etc., and are materialized in extremely diverse graphic ways, which give the handwriting an indisputable individual character.⁸”

The individuality of handwriting⁹ is reflected both in the overall characteristics, which are also called *dominant graphics*, and in the detailed ones, ie in the particular morphology of the graphic signs. The determination of each general characteristic, respectively the staged establishment of special or particular graphic characteristics (with their own forms of variability), represent only important and necessary steps of graphoscopic analysis, but for the elaboration of conclusions it is fundamental to achieve a *graphic profile* of the author features that is individual considering the uniqueness of the combination of all features. In other words, as in the case of other types of forensic identification (eg identification based on physiognomic features) the distinct characteristics are not unique (with some exceptions quite rarely found in other areas of forensic technique, which only confirm the rule), their combination being unique. A situation that can raise difficulties in practice is that of very similar writings and signatures, but if the evidence (in dispute, respectively comparison model) is sufficient in quality and quantity, there can be no risk of error or wrong conclusion. An analogy can be made with the situation of barcodes, which although at first glance look the same (in the form of a *series of barcodes*), the combination of elements is unique.

Skills are included in the definition of personality as its distinct side, along with character, temperament and creativity, being placed at the interference between the other sides. From ancient times the habits are considered as a second nature of the individual, due to their importance and influence, after being crystallized, on personality and behavior. The maxims preserved from antiquity are suggestive in this sense, such as: “*Consuetudo est quasi altera natura*¹⁰” or “*Consuetudinis vis magnum imperium est*¹¹”.

⁷ P. Popescu-Neveanu, M. Zlate, T. Crețu, *Psihologie - manual pentru clasa a X-a (Psychology - textbook for the 10th grade)* - Didactic and Pedagogical Publishing House, R.A., Bucharest, 1998, p. 134.

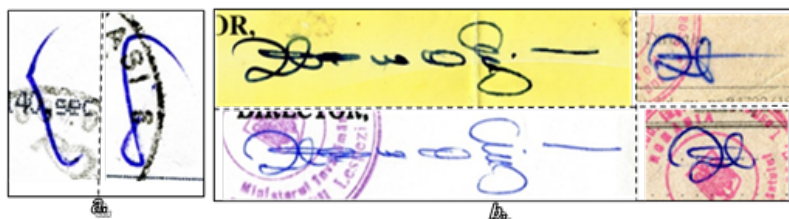
⁸ L. Ionescu, D. Sandu, *Identificarea criminalistică (Forensic identification)*, Scientific Publishing House, Bucharest 1990, p. 30.

⁹ P. Ștefănescu, *În slujba vieții și a adevărului – vol. II (In the service of life and truth - vol. II)*, Medical Publishing House, Bucharest, 1984, pp. 147 - 155.

¹⁰ Habit is like a second nature.

¹¹ The force of habit is a great power.

A very delicate problem arises in the case of quantitatively reduced writing tests or very simple signatures or those containing a very small number of compositional elements, which, in the order of ideas presented above, can only be unique or in other words individual, but not fully reflecting the individuality of their author due to the small amount of evidence in question. This situation is also encountered in other fields such as forensic genetic analysis, forensic fingerprint analysis, forensic traces examination etc. However, depending on the individualizing potential of the defining graphic features, the possibility of drawing definite conclusions in the case of written or signature evidence of small amount is not excluded, in accordance with a principle frequently discussed in judicial practice and in the activity of courts and names: *Arguments are not counted but weighed.*



Pic no. 2. Signatures without letters and with a very small number of elements in their composition, belonging to an official/clerk (a.), respectively signatures with few letters and a relatively large number of elements in their composition, belonging to a teacher, as well as the short version of them, which constituted the object of attempt to forge them (b.)

Image source: authors' personal collections.

In the pictures below Pics 2a. the illustrated signatures are made in the same context within a time frame of approximately five seconds by a civil servant in the category of those who must very often sign documents according to their duties. Without intending to generalize, it is worth mentioning that this type of situation is frequently encountered, as a result of a natural tendency (according to the law of minimum effort¹²) to simplify the process underlying a repetitive activity by joining the daily routine, so that extreme cases may occur, in the sense of excessive simplification of signatures whose individualizing potential becomes very low or zero. Also, the images in Pics. 2b. are representative of another frequently encountered situation, in which they opt for the use of an abbreviated version of the same signature template for situations considered less important such as

¹² „... the automation of skills means not only their smooth and fast development but also the minimization of voluntary effort and conscious, analytical control.” - P. Popescu-Neveanu, M. Zlate, T. Crețu, *Psihologie - manual pentru clasa a X-a (Psychology - textbook for the 10th grade)* - Didactic and Pedagogical Publishing House, R.A., Bucharest, 1998, p. 134.

attendance records, registries, receipts, proofs of receipt, different types of reports, minutes or other such documents or files with a mixed content and a very large volume, which must be signed on each page. The difficulty in using an abbreviated signature variant arises from the fact that this variant can be more easily forged (depending on the simplicity of the graphic constructions and the appearance of the components - primary or link, aspect that can be common or can be, at the opposite pole, characterized by an accentuated individual note), requiring a larger number of model comparison tests for a broader and more comprehensive analysis of the forms of particular variability, both structurally and regarding the dynamics. Closely related to this situation, which may arise in practice, it is necessary to specify that the very coincidence of the forms of particular variability (by relating the disputed evidence to the comparison model) is a solid argument in substantiating a certain positive conclusion. From the same sphere of possible situations in the practice of graphoscopic expertise, it is worth mentioning the situation in which the abbreviated form of a signature can evolve in different variants, and as a result of continuing the evolution process, significant differences may appear between the signature variants in which different signature patterns are outlined that require the formation of distinct groups belonging to the same graphic author. Depending on the extent to which the variants or signature patterns belonging to the same graphic author are differentiated, the integrated comparative analysis of groups and subgroups formed by preliminary and separate graphical examinations may be more relevant and conclusive (if the comparative graphical evidence offers this possibility).



Pic no 3. Different signature patterns and variations that come from different periods of time, belonging to the same graphic author

Image source: authors' personal collections.

Returning to the scientific basis of the identification of the person by handwriting analysis, it is noted that although in principle the basis for the

appearance of a trace is a process¹³ which always involves a certain dynamic defined by a series of general but also particular characteristics, to which a set of incidental factors is added, usually the interpretation and establishment of details related to the process that gave rise to a trace¹⁴ is made to find explanations necessary and to understand correctly the cause and effect, respectively to properly assess the characteristic elements that the trace reflects and on which the demonstration from which the conclusion results is based. In other words, in most cases establishing the dynamics of the processes takes place in a preliminary phase being indispensable, but auxiliary, however the demonstration takes into account elements and static aspects¹⁵ that define the traces, of course with the necessary exceptions, but in the case of graphoscopic analysis it reflects the course of the graphic thread, both as a whole and locally, starting with the preliminary phase of the examinations, continuing with the demonstration phase and ending with the elaboration phase. Consequently, writing must be seen as a unitary set of traces that reflects a dynamic reality and not a static one (L. Ionescu), as can be wrongly believed in accordance with the general trend.

An approach to the problems that graphoscopic analysis may involve, in which the emphasis is on aspects related to the structure and shape of graphic signs, in a more specific way to the traceological analysis¹⁶, due to the lack of specialized knowledge and laboratory experience, it will result in the formation of erroneous opinions or ideas about the foundation and scientific value of the results of graphoscopic analysis. Of course, it cannot be imagined and a complete and conclusive analysis is not possible if the structure and form of the graphic signs by which the writing materializes are disregarded, given the intimate connection (in the case of handwriting) between the

¹³ The idea becomes debatable, for example, in the case of negative traces (also called contour marks) seen as areas demarcated by the inner contour of some peripheral traces, in the sense that processes that change the state of the substrate surface produce effects only outside an area that has been covered and protected by the surface of an object, and at the subsequent change of position remains the contour that renders the respective shape, due to the inaction of the processes in the area of interest.

¹⁴ D. Voinea, C. Drăghici, I. Necula, *Categorii de urme care fac obiectul de studiu al tehnicii criminalistice* (Categories of traces that are the object of study of forensic technique), H.G. Chimics S.R.L. Printing House, Bucharest, 2011, pp. 23 - 33.

¹⁵ We take as examples the details and elements adjacent to fingerprinting, the characteristic elements of the marks produced on the cartridge tube and on the bullet by the components of firearms, the characteristics of the design of a footprint, genetic markers, physiognomic features etc.

¹⁶ H. Stahl, *Grafologia și expertizele în scrieri - Anonimul - Falsul* (Graphology and Expertise in Writing - The Anonymous - the False), Cartea Românească S.A. Publishing House, Bucharest, 1930, p. 7.

categories brought to attention (form, respectively dynamics), but also the fact that as in other areas of forensic science, the traces must be analyzed in all aspects. What is certain is that the form of the graphics, the synthetic or purely non-letter containing graphic constructions, as well as the auxiliary graphic signs, is in principle reproducible (with a fidelity whose measure depends mainly on the procedure used and the amount of the graphic sample, respectively simplicity of components and graphic constructions), but “The dynamics of natural graphics are irreproducible¹⁷...”. We mention on this occasion the reference to the form, respectively the dynamics of graphics, of a new problem that may appear in the activity of document expertise laboratories, namely the graphoscopic analysis of possible handwriting or signature tests performed with the help of robots.¹⁸, which can also be handcrafted - with a relatively simple hardware structure (including of course a movable arm with a device that allows you to attach a handwriting tool, such as a pen, ballpoint pen etc.) and a software component that allows you to download or upload the necessary data in electronic format (for example, in the form of files that may contain the image of a person's handwriting or signature), then initiate the command to reproduce the desired images on the chosen medium, using the attached tool, which can create very good condition the appearance of original or authentic (at least at first glance).

In view of the above, the writing must be included in the category of traces based on manifestations of a dynamic stereotype.¹⁹.

3. Working principles and procedural rules related to situations and practical issues.

The possibility of performing a comparative graphical analysis leading to valid results is conditioned by the observance of some basic procedural rules, which apart from the fact that they prove to be elaborated naturally from a theoretical point of view, are also confirmed by the long practical activity of specialized laboratories. The following will briefly list and treat a number of procedural rules that are often ignored or misunderstood by those who set the objectives of a specialist paper or to people who come in contact with such materials being interested for various reasons of conclusions, as well as other issues that help to clarify the underlying issues of graphoscopic identification.

¹⁷ L. Ionescu, *Expertiza criminalistică a scrisului (Forensic writing expertise)*, C.H. Beck Publishing House, Bucharest, 2010, p. IX.

¹⁸ Aspect of a research topic that we have in mind, respectively in work and that will be found in a future material.

¹⁹ L. Ionescu, *Expertiza criminalistică a scrisului (Forensic handwriting expertise)*, Junimea Publishing House, Iași 1973, p. 36.

Compliance with the basic criteria regarding the type and pattern of graphic characters is the first essential condition that must be met by the writing tests to be compared graphoscopically. The stated rule refers to the model of the standard forms of graphic characters officially established in the case of a certain alphabet, respectively the typographic model and the calligraphic model, as well as the type of graphic characters, which can be uppercase or lowercase (it goes without saying that we will make an abstraction from those alphabets in which such categories are not found, such as the Arabic alphabet). The rule also applies to signatures composed of letters. Also, in the case of signatures with no letter composition (or *indecipherable* - as they are frequently called in everyday language) it is necessary to find in the composition of the disputed evidence, respectively comparison model, elements and graphical constructions comparable²⁰ from a graphoscopic point of view, letter-based graphics and other purely non-letter component graphic constructions must be based on movements and gestures of the same categories so that the forms of graphic manifestation that reflect specific skills can be subjected to a comparative analysis, which has a practical and useful purpose. The situation below illustrates a situation in which two signature proofs are not graphoscopically comparable, as they are composed, for the most part, of graphic elements and constructions of different nature. In such cases, it is not advisable to draw a negative conclusion on the basis that the signatures have a clearly different composition, as such a conclusion cannot be supported by a proper, well-founded and convincing demonstration.



Pic. 4. Graphoscopically non-comparable signature proofs

Image source: authors' personal collections.

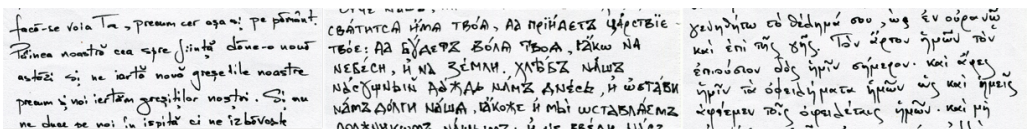
Returning to the situation of written and signature proofs that are not graphoscopically comparable, it should be noted that this does not mean that the evidence in question will not be examined at the request of the

²⁰ In reply to the statement of this basic condition which must be satisfied in order for the signature evidence to be examined comparatively, it has been stated in some cases that anything can be compared to something else without any impediment - which is true, but not any comparison has meaning and relevance in accordance with the rules of logic, as well as in terms of the scientific result obtained. For this reason, the term „graphoscopically,, has been added to the term „comparable”.

beneficiary²¹ or that the expert will not perform at least one series of examinations²² (preliminary and separate), as well as the description and illustration of the evidence in the report together with the necessary explanations and arguments, but the fact that the solution will be impossible to draw a positive or negative conclusion²³.

We also believe that graphic tests should be done using the same alphabet, although some authors²⁴ believe that the identification can be done by comparative analysis of writing tests using different alphabets. We must admit, however, at least in theory, that exceptional situations can always arise, in which certain special aspects make the usual rules not apply down to the smallest detail.

It is worth mentioning in this connection also the interesting opinion that the written evidence to be compared must be written in the same language²⁵, not just by using the same alphabet. The following images show handwritten texts that were written using different alphabets - by reference to the last rule stated, the question can be asked whether we can establish on the basis of a convincing demonstration that the writing tests in Pic. 5 and those in Pic. 6 were or were not written by the same person.



Pic. 5. Passages from the prayer „Our Father” written in handwriting by the protopsalt A.S. from Iasi, using different alphabets: from left to right - Latin, Cyrillic and Greek

Image source: authors' personal collections.

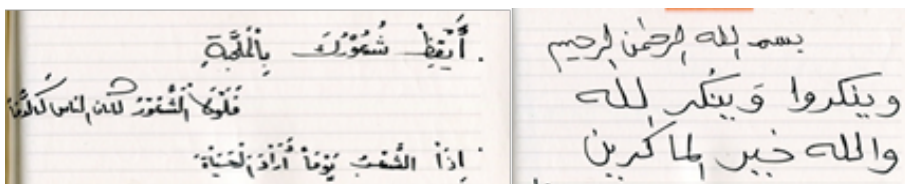
²¹ In a criminal or civil case, an official document drawn up in a specialized laboratory is sometimes required, from which it can be seen and in which a clear conclusion can be drawn in this regard.

²² S. Alămoreanu, *Problematica expertizelor criminalistice – Note de curs pentru studii de master (Issues of Forensic Expertise - Course notes for master studies)*, Hamangiu Publishing House, Bucharest, 2013, pp. 83-86.

²³ M. Marin, N. Buzatu, *Îndrumar de expertiză grafică (Graphic expertise guide)*, Ministry of Interior Publishing House - I.G.P.R., Bucharest, 1996, pp. 44 - 46.

²⁴ H. STAHL, *Grafologia și Expertizele în Scrieri - Anonimul - Falsul (Graphology and Expertise in Writing - The Anonymous - the False)*, Cartea Românească S.A. Publishing House, Bucharest, 1930, p. 6.

²⁵ L. Cârjan, *Tratat de Criminalistică (Forensic Treatise)*, Pinguin Book Publishing House, Bucharest, 2005, p. 402.



Pic. 6. Fragments of text with written philosophical and religious content by using the Arabic alphabet

Image source: authors' personal collections.

It goes without saying that it is very important that the writing tests to be compared contain graphics that show the same graphic characters²⁶ and just as important, in most cases, is that the writing proofs contain the same combinations of graphic characters²⁷ given that not only the connecting elements of the graphics may differ according to the letters that "merge" in writing, but also the constituent elements at the beginning and end of the graphics, or even certain features of the main elements²⁸, in addition to the fact that the particular way of constructing the graphics may be different depending on the position it occupies within the word²⁹. Regarding this rule, we consider that a definite identification cannot be made only on the basis of the analysis of the general graphic characteristics.

Another very important requirement is that the comparison holographic samples come from the same time period or at least as close as possible³⁰ the period in which the disputed evidence was written or which is the subject of questions to be answered in the expertise. Analysis of the writing samples that appear in the images presented in Pic. 7 (a./b.) provides a sufficiently strong argument in this regard.

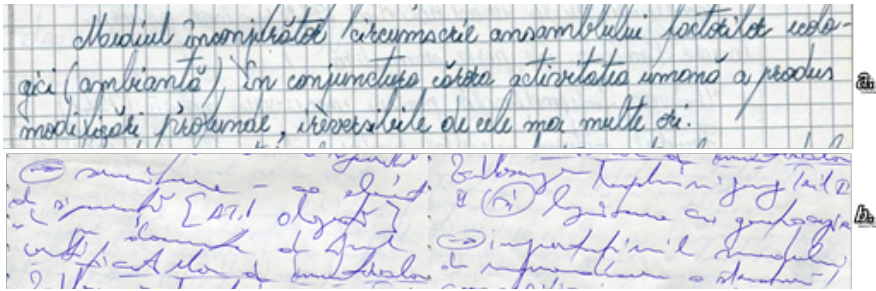
²⁶ We refer to the standard graphic forms of the alphabet, which are the basis of the graphism, as a model.

²⁷ I. Mircea, *Criminalistica* – Ediția a II-a (*Forensic Science* - Second Edition), Lumina Lex Publishing House, Bucharest, 2001, p. 207.

²⁸ V. Bercheșan, M. Ruiu, *Tratat de Tehnică Criminalistică* (*Treatise on Forensic Science*), Little Star Publishing House, Bucharest, 2004, pp. 484-489

²⁹ A.E. Frant, *Criminalistică – Curs universitar* (*Forensic Science – University course*), Universul Juridic Publishing House, Bucharest, 2018, p. 201.

³⁰ L. Cârjan, *Tratat de Criminalistică* (*Treatise on Forensics*), Penguin Book Publishing House, Bucharest, 2005, p. 402.



Pic. 7. Writing samples belonging to the same graphic author, made at a difference for more than twenty years (both texts being „notes”)

Image source: authors' personal collections.

Other arguments for compliance with the requirement that the written or signature tests to be compared come from the same time period are given by the possibility of the occurrence and evolution of diseases that influence the way the central nervous system coordinates movements or medical problems, often irreversible, which directly affect the effector organ. Closely related to these observations is the fact that handwriting³¹ faithfully reproduces both the influence of possible internal and possible external factors, in principle all the general and particular aspects that the course of the graphic thread representing the conjugate effects of a cumulus of factors, not being indicated the analysis of a characteristic or a certain aspect concretely, disregarding the other characteristics and aspects, respectively the meaning they have³².



Pic. 8. Second grade student writing (left, dashed background) and an 85-year-old person (his grandmother, right)

Image source: authors' personal collections.

We draw attention to the practical and theoretical problems related to the interpretation of the aspects that define the dynamics of graphic paths, through which certain handwritten texts or signatures materialize, the fact that special situations were encountered in the case of laboratory activity in which counterarguments were brought to combat the demonstration and implicitly the conclusions, in the sense of suggesting different causes³³ which could have had similar effects (for example, in the case of a genuine signature

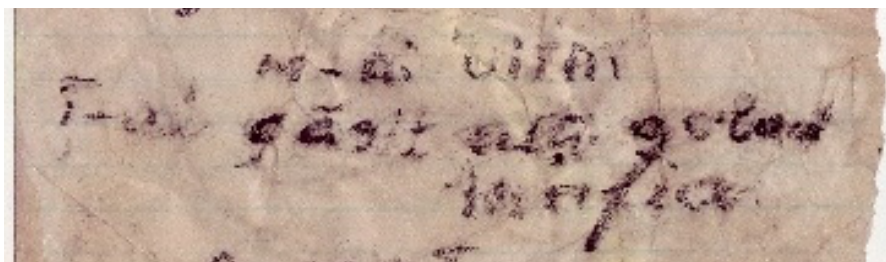
³¹ Considered by the Greek philosopher Plato as the „geometry of the soul”.

³² A.E. Franț, *op. cit.*, p. 198.

³³ C. Suciu, *Criminalistică (Criminalistics)*, Didactic and Pedagogical Publishing House, Bucharest, 1972, pp. 478-481.

which was made by a person suffering from Parkinson's, another interested party claimed that the document should be declared null and void servile). In this regard, we point out that the possibility of confusion between the various causes that may influence the dynamics of writing is excluded if sufficient comparison materials are available that meet the requirements of specific work procedures, given a high level of laboratory experience and training appropriate professional. In the same idea, an expert or a specialist who demonstrates professional vigilance and rigor, in the presence of aspects that cannot be explained in any way or certain uncertainties that cannot be clarified, in connection with the examined evidence, will express that uncertainty and the content of the conclusions.

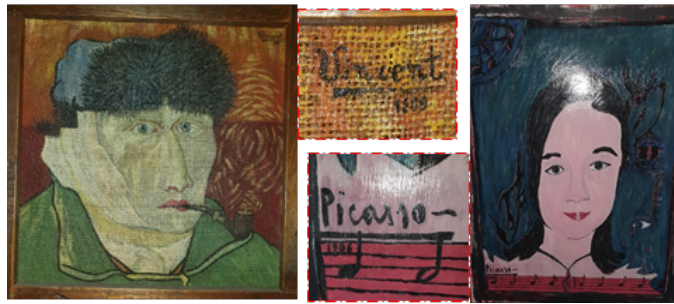
The multitude of causes that can influence the dynamics and implicitly the form of writing, to which is added the different way these causes act in practice depending on the unique psychosomatic structure of each person, as well as other related issues, is a very broad research topic that can be the subject of a series of studies, articles and distinct specialized materials, not being possible to exhaust the subject in question in a paper with a general scope. Among the causes often mentioned in the literature we mention an example: different types of diseases, current conditions caused by internal and / or external factors that take us out of the usual "patterns", old age, different stages in learning and training specific skills, fatigue, disguise, intoxication with various substances, free or servile imitation, writing with the left hand in the case of right-handed people or with the right hand in the case of left-handed people (a special case being that of ambidextrous people), support³⁴ and / or the instrument with certain special features etc..



Pic. 9. Handwriting fragment (part of a threat note) written in a colored pencil with thick mine to prevent identification

Image source: scientific paper from the laboratory's archives.

³⁴ D. Sandu, *Falsul in acte – Descoperirea și combaterea prin mijloace tehnico-criminalistice* (Forgery in documents - Discovery and combat through technical-criminalistic means), Dacia Publishing House, Cluj-Napoca, 1977, pp. 9-10.



Pic. 10. Reproductions of works by painters Vincent Van Gogh, respectively Pablo Picasso, with free imitations of the signatures of the great artists (illustrated in the details below), in private collections

Image source: Private collections whose owners want to remain anonymous.

4. Conclusions

Following the study of the literature on graphoscopy, it can be said according to appearances that everything that could be written about this field was written (an opinion that has been heard not infrequently over time), but also the practice and activity of research in the same field demonstrate that there are always points and directions for the development and deepening of specialized knowledge, resistance and completion of data that define at some point the stage of knowledge. In principle, it can be said that especially the practice combined with the research activity always opens new horizons, offering new ideas for research and study topics, ensuring the scientific progress in a certain field.

Note: This article was made in compliance with the General Data Protection Regulation No. 679/ 27 April 2016.

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