



The Importance of the Quantitative Criterion of the Comparative Material

Pàvlos Kipouràs

Prof., Scuola Forense di Grafologia (Napoli, Italy), Scuola di Grafopatologia Forense (Napoli, Italy), Scuola Superiore di Perizie (Prato, Italy), Centro di Studi Grafologici (Rome, Italy), Accademia Grafologica Crotti (Milano, Italy), Athens, Greece, ORCID: <https://orcid.org/0000-0002-4021-7584>, e-mail: kippaolo@gmail.com

The comparative material of an expertise in Forensic Document Examination should meet the methodological requirements in order to create a stable and safe point of reference in the comparison between the suspected document and the known exemplars of the involved person(s). Among the criteria that must be taken into consideration, the quantity of specimens remains of crucial importance in order to cover the whole frame of graphic variability of the authentic hand. In the case of an amplified range of graphic variation of the writer, having at our disposal much more comparative material becomes more demanding, since identifying the writer necessarily means that we have to find all his particular graphic characteristics in the suspected document, as shown in the known specimens.

Keywords: comparative material; quantity; graphic variation; methodological criteria; validity.

Значення кількісного критерію порівняльного матеріалу

Павлос Кіпоурас

Порівняльний матеріал у судовій експертизі документів повинен відповідати методологічним вимогам для створення стійкої та безпечної точки відліку для порівняння досліджуваного документу та відомих екземплярів, які належать певній особі (особам). Поміж критеріїв, які слід урахувати, кількість зразків залишається вирішальним чинником для охоплення всього спектру графічної варіабельності автентичної руки. У випадку поширеного спектру графічних відмінностей виконавця наявність значно більшої кількості порівняльного матеріалу є особливо необхідною, оскільки ідентифікація виконавця обов'язково означає, що ми повинні знайти всі його конкретні графічні характеристики у досліджуваному документі, зафіксовані у відомих зразках.

Ключові слова: порівняльний матеріал; кількість; графічна варіація; методологічні критерії; валідність.

The report of the Forensic Document Examiner should be based on the theoretical and methodological criteria of his specific scientific sector. The expertise in its procedural structure is organized according to different steps of actions which have to be followed by respecting the protocols in a strict way, in order to arrive to a correct estimation of the forensic findings.

The application of methodological requirements in the procedural steps of the expertise is analogous to a mathematic equation. An error in the first part of the procedure will definitely affect negatively the final conclusion. The basic criteria that have to be applied in the initial part of the elaboration of the available comparative material are the following:

- The **qualitative** criterion regarding the expert's possibility to examine the original documents or different forms of

reproduction of them, such as photos, scans, photocopies or other,

- The **chronological** criterion regarding the expert's possibility to compare the suspected documents to specimens of the same period, so as to have a complete frame of the writer's skill in the suspected period and,
- The **quantitative** criterion, which refers to the quantity of specimens of the comparative material.

It is commonly accepted that the comparison between suspected documents and known exemplars is based on the *comparative* method which is almost universally applied in the scientific community of Forensic Document Examination. This comparison though should meet the requirements of the above mentioned criteria. The comparative material should be considered

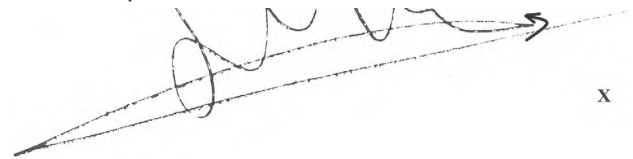
adequate in every one of them. Forensic Document Examiners usually face problems because of lack of comparative specimens. We can't define precisely the number of exemplars needed, since it depends on the specific particularities of every case. As a general indication, we could say that more comparative material available results in a safer conclusion of the expert [5, ch.10, §40]. Without the intention of diminishing the importance of the other criteria, the quantitative one is fundamental because it should cover the whole range of variation [7, p. 155] of the graphic expression of the hand. For several decades FDE's have found and applied as an axiom [5, ch.5, §28] that two genuine signatures can never be identical in practice, not even those of different persons [3, p. 25, §3.1.1, §3.1.2]. This was first confirmed by Hagan in 1894 [4, p. 91—92]. He refers to a famous mathematician of his era and according to his calculation of the possibility of reproduction of the same identical signature by the same hand, he concluded that this could only happen once in two trillion, eight hundred and sixty-six billion times. Although this thesis is considered an axiom and point of reference for FDE's, it was only proved scientifically for the first time recently [6, p. 157—173] in four different ways. This variation is also defined as "*intra-writer variability*" by Wakshull [8, ch.7], which means 'the differences in the way a person writes among sessions'. It is practically another way of defining the term of graphic variation of the same hand [2, p. 8—26], which could be the result of not only internal (physiological, anatomical, ophthalmological, psychological, clinical) factors, but even external factors which could affect the handwriting.

The definition of the limits of the range of graphic variation depends on the quantity of known exemplars at the disposal of the expert. It also depends on the grapho-kinetic capacity and skill of the writer, since more skilled writers sometimes have a more extended range of variation. In case of signatures, this variation could even refer to different models or to the contemporaneous use of alternative squiggles. Hence, the comparative material should possibly encompass the whole range of variation so as to help the expert's investigation.

In the same time, expert should pay attention to natural variation as defined by the

characteristics of the comparative material, since these elements do not indicate a different hand, but very often emphasize the limits of what the authentic hand is capable of [1, p. 231]. The forger tries to remain as much as possible close to the morphological aspect of the authentic specimen to imitate, because through this superficial similarity he tries to convince about the genuine origin of the suspected handwriting. Since the hand is not a kind of printer or stamp so as to create completely identical forms in different occasions, the range of variation can stabilize what remains beyond the limits of skill of the authentic writer.

A suspected signature is disputed by the person who has signed the document claiming that it is forged and that he did not ever signed it. Although all the other graphical characteristics were compatible, there was a different direction of the graphic movement in the beginning of the final stroke which underlines the signature. In the suspected specimen the hand was following an anti-clock wise direction, while in the comparative material this tendency was present in only 3 out of 501 exemplars.



Im. 1. The anti-clock wise direction of the hand in the final part of the suspected signature

The large quantity of comparative material (501 specimens) has allowed indicating the authenticity of the suspected signature.



Im. 2. The anti-clock wise direction of the suspected document is found only in 3 authentic specimens (A1) out of 501 with clock-wise direction (A473)

The FDE's should be based on the methodological requisites of the scientific protocols. Among them, the quantitative criterion is of utmost importance because it defines the range of graphic variation of the authentic hand and becomes a stable point of reference for the comparison. The abundance of the comparative material is always in favor of the expert in the direction of a correct conclusion.



References

1. Cristofanelli A., Cristofanelli P. *Grafologicamente, Manuale di Perizie Grafiche*. Roma, 2004.
2. Ellen D. *The scientific examination of documents Methods and Techniques*. 2nd ed. Taylor & Francis, 2003.
3. European Network of Forensic Science Institutes—ENFSI, *Best Practice Manual (BPM) for the Forensic Handwriting Examination*. Ed. 4th. 9/2022.
4. Hagan W. E. *A treatise on disputed handwriting and the determination of genuine from forged signatures. The character and composition of inks, and their determination by chemical tests. The effect of age as manifested in the appearance of written instruments and documents*. New York, 1894.
5. Huber R., Headrick A. *Handwriting Identification: Facts and Fundamentals*. CRC Press, 1999.
6. Kipouràs P., Kosmidis C., Skarpalezos D. Why Two Genuine Signatures are never identical in Practice: Evidence and Scientific Explanation. *International Journal of Innovative Science, Engineering & Technology*. 2021. Vol. 8. Is. 4.
7. Morris R. *Forensic Handwriting Identification*. London, 2000.
8. Wakshull M. *Forensic Document Examination for Legal Professionals: A Science-Based Approach*. Q9 Consulting, Inc., 2019.