Measuring Decisions: A Proposal for Quantitative Study in Forensic Handwriting Examination

Sujay Saha[1], Kananbala Jena[2]

[1, 2]Dy. Director & Scientist 'D', Central Forensic Science Laboratory, Ministry of Home Affairs, Government of India, Kolkata, India

Abstract: *Reports related to Forensic handwriting examination often face harsh criticism in courtroom. At times it is claimed that the similarities or dissimilarities cited by the expert is not present. In many cases it may be claimed that there is a similarity or dissimilarity which is not noticed by expert. It is not uncommon to find two opposite reports filed before court in the same case by two different experts. Such a situation often adds to confusion and chaos and leads to doubtful situation in court regarding credibility of expert opinion. Pictorial similarities and differences are a matter of perception thus allows wide scope for debate and personal opinion. Though pictorial appearance does not present a complete scenario of forensic handwriting examination, the reasoning by experts presents a simplified explanation of decision making by experts so that a layman can understand. In the process many omissions happen. These omissions often include facts which are soul of handwriting examination which in turn causes failure of forensic community to sensitize courtroom about meticulous task of handwriting examination. The popular belief that simple explanations can make advocates and judiciary understand scientific work has built perception of handwriting examination as only comparison of like to like as this is only part get presented in courts case after case. In pursuit of acceptance by layman, document examiners prefer not to highlight more intricate parts of this comparison which can help the court in differentiating between cursory and scientific examination. This paper will discuss current system of expressing reasons and suggest changes which can be done in current format of reasoning to illustrate science involved in examination of handwriting.*

Keywords: handwriting examination, reason, class characteristics, individual characteristics

1. Introduction

Handwriting is a process which is consciously performed by a person. It involves the both body and mind. A person cannot write if he does not learn to write. Therefore, handwriting requires a minimum training. At the same time once a person's proficiency improves variations are made. Less proficient writer writes slowly and with great difficulty with full attention to pen and paper, whereas skilled writer perform this task without hesitation. A skilled writer can talk or look up for a conversation while making a signature or writing a short sentence. Full attention to pen and paper as well as causal way of writing both are involuntary actions. Both involve two different state of mind, motor and muscle control. The reflection of this complex combination of training, voluntary and involuntary action transferred to paper through handwriting. The Forensic practitioners reverse engineer these handwritings to recover dynamics involved while the pen and muscles were in action. But, reasons provided by most of the experts are mostly description of what similarities or dissimilarities found in the given case which deprives forensic examiners of their due credit and reduces the task of fixing authorship of handwriting to mere visual comparison which is far from truth. This paper will discuss present format of reasons and suggest few parameters which can be added in reasons for better documentation of task done by handwriting experts.

2. Measuring and Reasons

The handwriting examiners broadly divide skill of writer into two sets as class characteristic and individual characteristic. But, means to measure most of the characteristics is not available, due to which reasons for handwriting examination often limited to only mention of most important characters like 'skill', 'speed', 'line quality', 'rhythm' etc. thus, visual comparison of letters, words and symbols occupy a prominent place in reasons contrary to the fact that visual similarity alone cannot be basis of a scientific handwriting comparison. 'Isn't this the same problem that confronts the forger and the document examiner - to get beyond the perception of the form of the letter and to get to the movement that actually creates the letters? The word "similar," no matter how it is used by the document examiner, in the minds of the attorney, judge and jury means "looks like," and that is not where we want to focus their attention. We can, instead, draw upon past and present scientific experiments and principles to correctly evaluate the structural differences that appear when two biomechanical systems (two people) produce handwriting. Handwriting, biomechanics and significance: concepts in handwriting identification by Emily J. Will, CDE'. Obviously, examiners of questioned document struggled to bring on record scientific basis on which their comparison is based since a long time.

3. How reasons are drafted

The reasons accessed by us mostly contained following parts
a) A statement about how standards are suitable for comparison.
b) One section devoted to similarities found between words, letters, figures and their combination
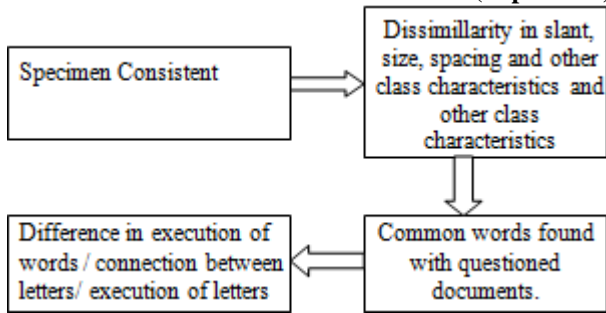
Flowchart of reasons for same writer (in practice):
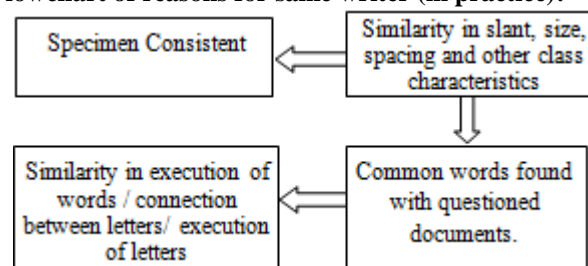
Flowchart of reasons for different writer (in practice):

Exclusions in recorded reason as practiced currently

Speed, line quality, skill, rhythm though mentioned in the reasons description of the same with reference to case at hand is very less. At the same time which actions of muscle

or brain has caused similarities and why it is a remarkable similarity is not mentioned.

Steps for achieving similarity by an author can be divided in following steps (From the writer's perspective)
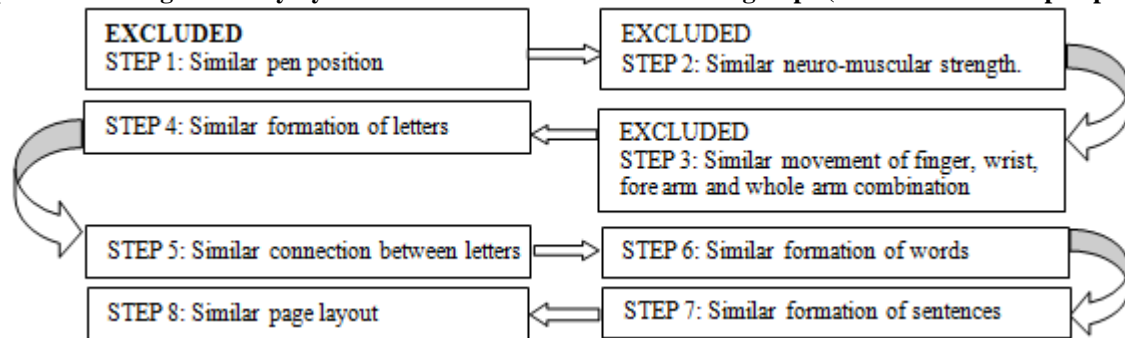
Steps for dissimilarity by an author can be divided in following steps (From the writer's perspective)
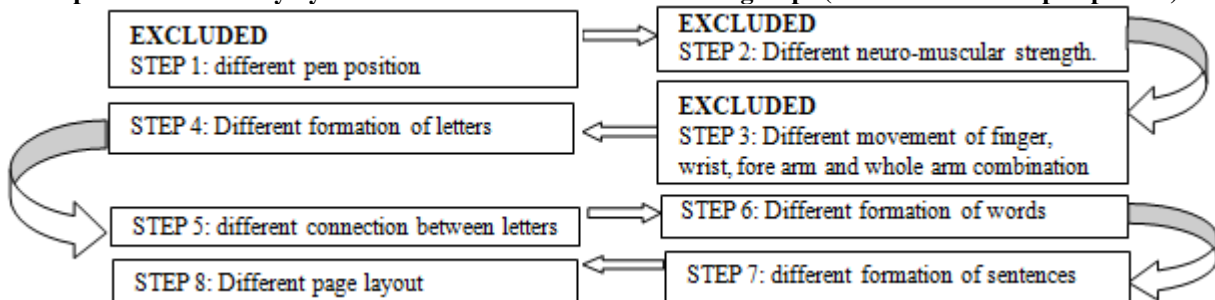
Step 4 to Step 8 can be seen on written document. Steps 1 to 3 will be reverse engineered and assigned value in the examination process but not in the recorded reasons which is an important omission. There is a necessity to assign value to most significant characters and put before the court on record.

4. Suggested additions in reasons

"One of the aspects of writing by which its excellence (skill) is judged is its uniformity. The lack of uniformity affects appearance even to the point of the writings legibility. Uniformity or the lack of it is observed in alignments, letter slopes, and the consistency of shape in repeated letters or in different letters having common elements." Huber, Roy A., Headrick, A. M., *Handwriting Identification: Facts and Fundamentals*.

We have suggested three additional factors which intends to do skill measurement by measuring writers ability to achieve

uniformity over a period of time, complexity and repeatability with special reference to words.

1) **Fixed habit over a reasonable time:**
- **Based on principle:** Handwriting which has not changed within time period in which question and standard is written can be identified with more certainty. More value should be assigned to handwriting which has not changed.
- **Suggested measurement:** time span of (questioned documents + consistent specimen+ consistent admitted) for each Common words found between questioned and standard.

2) **Complexity of the movement involved:**
- **Based on principle:** it is more difficult to imitate complex movement. Complexity is a function of no of strokes involved.
- **Suggested measurement:** No of characters involved in making the word for each common word with similar strokes found between questioned and standard.

3) Repeatability of movement:

- **Based on Statement:** A combination of movements accurately repeated reproduces a similar written word. More repetition of accurately repeated movements should be assigned more value.
- **Suggested measurement:** number of times word is repeated in the specimen + number of times word is repeated in the questioned document in similar fashion per each Common word found between questioned and specimen.

5. Conclusion

Some more features may be introduced in future to increase measurability of decisions taken by forensic document examiners. Visual (dis)similarity decided by an expert still has a role in the scheme of deciding (dis)similarity described in this article which can be diluted by different mathematical and statistical methods. The model discussed here is devoid of any role assigned to natural variation.

References

[1] Harrison D, Burkes T, Seiger, D, Handwriting Examination: Meeting the Challenges of Science and the Law, Forensic Science Communications, October 2009, Volume 11, Number 4.

[2] Caliguri, M.P. and Mohammed, L.A., *The neuroscience of handwriting: applications for forensic document examination*. Taylor & Francis Group, LLC, 2012.

[3] Steve Graham and Naomi Weintraub A review of handwriting research: Progress and prospects from 1980 to 1994: Article *in* Educational Psychology Review · March 1996

[4] Osborn, Albert S., Questioned Documents, Second Edition, Patterson Smith, Montclair, NJ, 1978.

[5] Journal of Forensic Document Examination Volume 26 2016 Published by the Association of Forensic Document Examiners www.afde.org ISSN 0895-0849 SPECIAL ISSUE THE MODULAR FORENSIC HANDWRITING METHOD.