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TABLE of CONTENTS

Editorial	1
Editorial by Wendy Carlson.....	3
Document Examination by Shayla Ford.....	4
Enough Exemplars by Katherine M. Koppenhaver.....	14
Robert Saudek’s Experiments with Handwriting.....	17
A Case of Disguise.....	19

Editorial

I have decided to change the publication of the IADE SCIENTIFIC JOURNAL earlier instead of the end of the year. I have more time in the winter after the holidays. So, you are getting the 2024 Edition shortly after the 2023 Edition.

As always, you are welcome to submit articles for the journal. It is advantageous to be published and the best way to start is with an article. If you have difficulty writing, you may want to find someone to co-write an article for the journal. I am willing to review and assist anyone who wants to be published. Pick a topic that is of interest to you relating to our field such as an interesting case you handled. I wrote my first article About “Do’s and Don’t’s for Accuracy in Suspect Document Cases because I saw a need for people to take better care of questioned documents. Since then, I have gone on to write numerous articles and a dozen books.

When I first became a document examiner, an attorney told me that he wanted to hire the person who wrote a book on the subject. Whenever I have waited to testify with another expert in a different field, his first question is, “Are you published?”

I have also included another editorial. This comes from Wendy Carlson. I concur with her assessment of the field regarding document examiners who belong to certain organizations and claim that they are the only real document examiners and the rest of us are not qualified. I have come across many of these document examiners in my career to date. They have tried to get me disqualified in court but they were surprised when I was allowed to testify.

I have dealt with one document examiner who has tried to destroy my business by sending out a letter stating that I am not qualified for a level entry position. This letter has been circulated for the last 40 years and I am still in business despite his efforts to destroy my business. He has caused me to lose cases as a result of his misinformation.

The main article that I am publishing comes from a former student of mine who wrote the article for her university. She has been very interested in our field but she has college bills to pay and has taken a different direction at this time.

Some clients try to deceive their document examiners by misidentification of documents, especially the guilty party who doesn’t give incriminating signatures to get their examiner to opine in their favor. For example, I have had several cases involving clients who attempt to deceive by denying their genuine signatures. In one case opposing examiner was misled because the client stated that all the signatures that he had executed were his father’s signatures. For this reason, it is important to get copies of everything that the opposing examiner reviewed.

The “Code of Professional Responsibility” includes 15 requirements for all forensic analysts. They mostly cover implied scientific and ethical standards, but seem to codify many of the widely-held set of rules:

- Accurately representing credentials.
- Being honest and truthful
- Fostering professional competency
- Continuous learning
- Conducting research and forensic casework
- Preventing evidence tampering
- Avoiding conflicts of interest
- Conducting examinations that are fair and unbiased
- Making and maintain accurate records
- Ensuring findings are backed by data and free of influence and bias
- Issuing opinions and conclusions only within areas of expertise
- Preparing reports with straightforward language – including known limitations
- No alterations or omissions of information for strategic advantage
- Encouraging whistleblowing of improper actions
- Honest communication all informative findings to all parties, including defense
- For managers: informing prosecutors of improprieties or breaches of law or standards

I have been asked to chair the Ethics Committee for IADE and I have been asked to present a lecture at our next seminar on Ethics.

Kathie

The Character of Experts By Wendy Carlson

The word, character, is defined as the complex of mental and ethical traits marking and often individualizing a person,¹ the aggregate of features and traits that form the individual nature of some person or thing; one such feature or trait; characteristic, moral or ethical quality², and the particular combination of qualities in a person or place that makes them different from others³.

Many of these definitions speak of ethical character. Ethics is a study encompassing a vast amount of information that will be discussed for ages. I started writing this article with a look at the integrity of some document examiners. I realized that I was not typing about the integrity of document examiners as much as I was typing about the character of document examiners. There are a group of document examiners who claim that they are the only qualified examiners and the rest of us are not competent examiners.

One of the moral traits of character is integrity. Integrity is observed in the actions of a person and has been defined by Merriam Webster as a “firm adherence to a code of especially moral or artistic values, incorruptibility, soundness, the quality of state of being undivided, completeness⁴.” To define integrity any other way would be lacking the very fiber of the word itself.

As a document examiner I see many things about the character of some people whom I find lack integrity. We have all come across at least once in our careers a handwriting expert generally on the opposite side of one of our cases. Instead of addressing the differing opinions, these document examiners produce reports stating that anyone not in their organizations is not a real document examiner. They even write articles stating that only document examiners in their organizations are legitimate examiners.

These document examiners make it their mission to criticize others in the field as being inferior to try to keep us from being accepted as document examiners. These “experts” negate the definition of the word character. Such an expert sets out to destroy, demean or demoralize other experts. An expert on a hunt to destroy, demean and demoralize another expert lacks every definition at the beginning of this article. Instead of judging us on our training and our memberships, they should be discussing the differences between their opinion and that of an opposing examiner.

Are we document examiners not called to be of the same mindedness: examine objectively to find the truth of the matter and report on such? Were we not all at one time called to do good unto others whom it is due when it is our power to do so⁵? How then is it that unless we are members of the same association, they attempt to destroy us by trying to discredit us every chance they get?

These document examiners keep teaching their trainees that those of us in the private sector are not qualified of being “real” document examiners. What better way to destroy someone’s dream of becoming recognized as an expert in their industry than to try to destroy the opposition’s reputation by claiming that anyone who does not belong to their group is a “wannabe” examiner. We have all lost business because of the malicious attack on our credentials that is not warranted. It is not always in the courtroom and it is not always the other expert instigating the process of deconstructing a person’s character.

¹<http://www.merriam-webster.com/dictionary/character>.

² <http://www.dictionary.com/growse/character>

³ <http://www.dictionary.cambridge.org/dictionary/english/character>

⁴ <http://www.merriam-webster.com/dictionary/integrity>

⁵ Proverbs 3:2

Document Examination

Shayla Ford

Forensic handwriting examination is regarded as a powerful analytical process of detecting singularities and regularities of a handwritten text. The intent is to identify the writer and assess the credibility of linking the writer to the handwritten text. Osborn's (1910) publication, *Questioned Documents*, highlights the importance of investigating the genuineness of handwritten text with the need to limit its impairment to its value as evidence. By the 20th century, handwriting analysis was not considered to have evolved as a tool in forensic science critical towards enhancing prosecutorial court cases, but with Osborn's emphasis, forensic science has gained much attention in handwriting analysis to enhance the credibility of evidence gathering. Currently, handwriting analysis focuses on a theoretical principle which is the shapes of the stroke and the relative positions and sizes of letters and words (Guarnera et al., 2017). Fundamentally, these include ink analysis, graphology, typography, document analysis, and expert testimony. These are the diverse quantifiable features approach to analyzing handwritten text. The following is a literature review research paper that investigated current knowledge regarding handwriting analysis. The literature review investigated papers (quantitative and qualitative) peer-reviewed and credible research articles and journals to understand the history, evolution, science, and criteria of handwriting analysis critical for enhancing evidence collection for court cases.

The Concept of Handwriting Analysis

In any court proceedings, the presentation of evidence is a common requirement and for most lawyers and prosecutors, the introduction of documents is notable. According to Osborn (1910), in the publication *Questioned Documents*, lawyers and prosecutors are often called upon to defend or impeach a questioned document. A questioned document is defined as a document that is in dispute in a court of law and requires a primary examination of its contents to provide evidence about suspicious or questioned documents based on scientific principles and methods (Osborn, 1910). Handwriting analysis involves the comprehensive comparative evaluation of a questioned document and the known handwriting of the suspected writer. The scientific protocols involve analysis, comparison, and evaluation of the collected evidence and the handwriting of the suspected writer.

The initial step of analysis requires identifying the known writing of the suspect and the unknown writing sample with distinctive characteristics. The role of an examiner is to identify unique qualities including the letters and word spacing, word slant, and proportionality alongside the size of the letters, in addition to the unfamiliar formations of letters and other individual attributes (Hicklin et al., 2022). Osborn (1910) emphasizes caution in how the document or the evidence is handled. According to the writer, the genuineness of the evidence is questioned based on how it is handled. The advice is to handle the document with a high level of careful regard for the value of the evidence and to ensure that the physical condition of every part of the suspected document is observed in detail and the document is preserved in a condition that is not suspect (Osborn, 1910). With the analysis, forensic investigators should not touch, erase, cut, mutilate, or even dampen the writings to ease their analysis process. The intention is to safeguard the integrity of the evidence so as not to jeopardize the quality and progress of conviction or exoneration.

The second phase involves the comparison. Comparison entails the differentiation of elements from the known document sample to those of the unknown sample. The forensic examiner considers various aspects of the writings such as the typography and graphology (Marcinowski, 2022). Osborn (1910) explains that the suspected document must be classified depending on its contents. The contents can range from documents with questioned signatures, documents with alleged fraudulent alterations, documents attacked for their age or date, documents with the question of materials used in their production, documents investigated on the question of the writing, and documents investigated because the identity of the person’s handwriting is in question. Simply explained, the documents often put into question in court cases are checks, receipts, drafts, wills, deeds, papers with signatures, contracts, drafts, and contracts among others. In evaluating the documents, Osborn (1910) advises forensic investigators to evaluate the genuineness of the document and not to be hasty in judgment. Guarnera et al. (2017) explained that in most cases, a 24% average rate of handwriting error analysis occurs annually. The figure below is a description of the errors made in identifying the accuracy and credibility of handwriting analysis. From the data, it is evident that proportion analysis accounts for the highest error rates at about 24% in handwriting analysis error and followed by a position at 13.7% (Guarnera et al., 2017). Other handwriting errors committed include directional trajectory, alignment, disfigure, missing subpart, merges, breaks, and style among others.

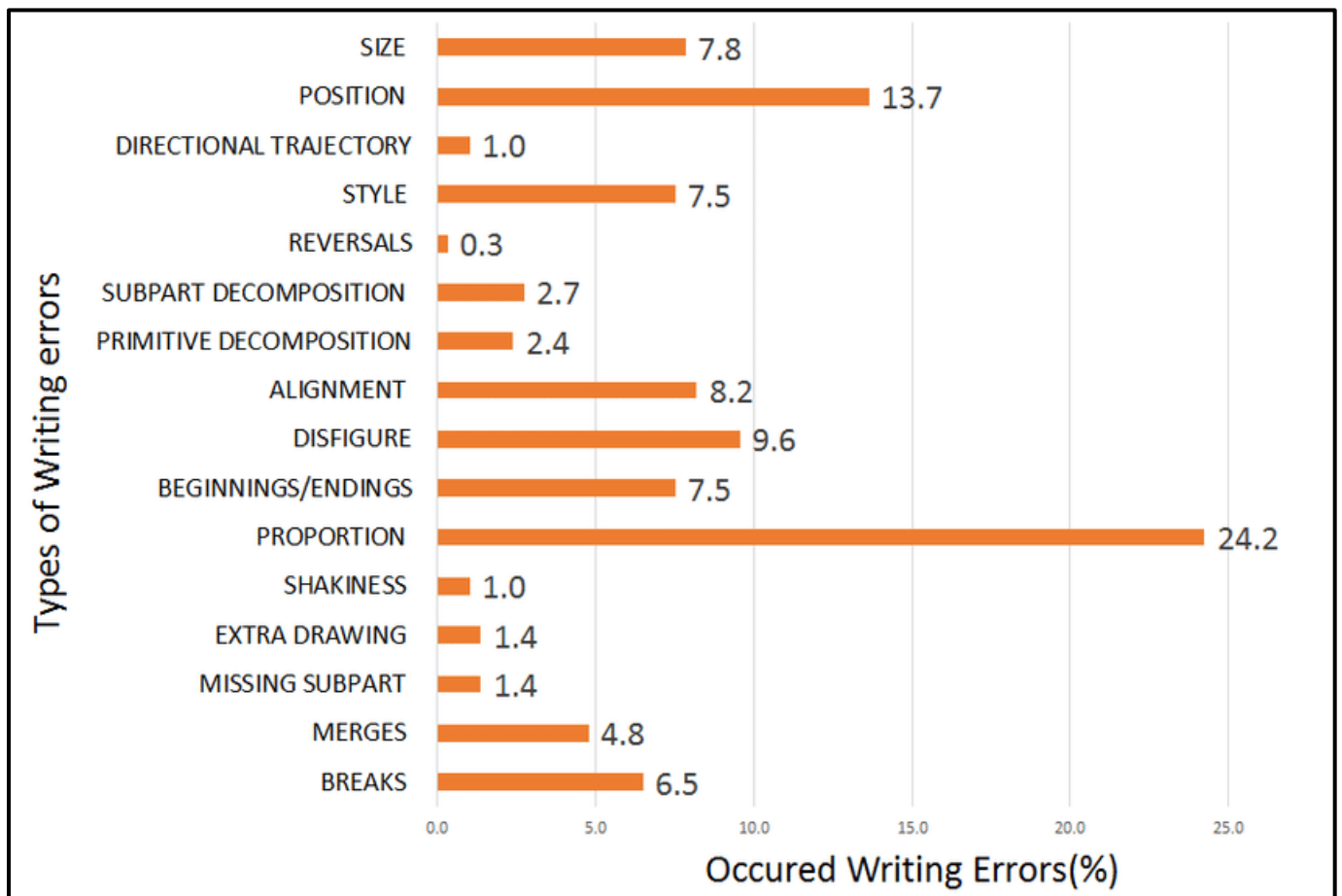


Figure 1: Handwriting Errors Commonly Made in Forensic Analysis (Guarnera et al., 2017).

The final phase is an evaluation which is the analysis of the similarities and dissimilarities of the known and unknown samples. Caution is however prescribed in this process as noted in Figure 1 given that differences can result in false positives or false negatives which impact the judgment of the examiner in evaluating the totality of the documents (Alaei & Alaei, 2022). Osborn (1910) explains that forensic investigators must be cautious in finding the almost similar markers which are evident in documents of forgery, especially with documents that have been torn, defaced, or soiled. The reason is that the distorted document can have some apparent similarities but with further in-depth examination, the investigator will be able to notice the unknown dissimilarities.

History and Evolution in Handwriting Analysis

The history of handwriting analysis can be traced back to thousands of years in China where graphology was selected by imperial officials according to their penmanship. It can also be traced back to Greece, where physicians used handwriting to diagnose illnesses. Literature suggests that Aristotle (over 2000 years ago), an Italian Physician and professor of philosophy at the University of Bologna, and Abbe Michon (1800) were credited for the emergence, recognition, and enhanced understanding of handwriting analysis. In the 19th century, graphology began gaining attention when researchers began to study the links between personality traits and handwriting characteristics (Smith, 1984). In the early twentieth century, according to Marcelli and Parziale (2022), graphology gained popularity in Europe as a technique and tool for analyzing the personalities of job candidates alongside potential spouses.

In America, handwriting analysis gained popularity in the 20th century in forensic investigations as highlighted by Osborn (1910). The first case when handwriting was used was in 1902 when an expert witness testified in a trial accusing a man of forging a cheque. Since then, handwriting evaluation has been used widely in the criminology field including criminal and civil cases and as such, has become an important field of forensic science (Marcelli & Parziale, 2022). Pierre Janet, a French psychologist defined the analysis of handwriting as the science of the future from which, handwriting traits and character analysis have often been used together similar to how fingerprints are used to detect the character of a suspect.

The evolution of handwriting analysis has focused on technological innovation. These include digital handwriting analysis software that permits forensic investigators to input handwriting samples to analyze them using algorithms and machine learning models. Another is image processing software which is used to enhance and manipulate digital images of handwriting samples which permits forensic investigators to visualize and analyze individual letters, and strokes among other features (Hicklin et al., 2022). Spectrographic evaluation is another evolution that has happened where sound waves produced by an individual's writing instrument as it moves across the writing surface are assessed. The importance of this is to help identify the unique characteristics of a person's handwriting including variations of pressure and speed (Hicklin et al., 2022).

Finally, there is a forensic light source which is regarded as a specialized light source that emits diverse wavelengths of light which can reveal altered or hidden writing. An example is the use of ultraviolet light which can be used to identify erased or overwriting text and infrared lighting which

can disclose the impressions left by writing instruments on multiple sheets of paper (Hicklin et al., 2022). The noteworthy evolution that handwriting analysis has undergone is determining it as a subjective and interpretive field in forensic science that utilizes both human expertise and judgment.

Research Methodology

The research methodology is a literature review of published journal articles and credible sources of information focusing on criminology and forensic science in handwriting analysis. An eligibility criterion including inclusion and exclusion criteria was used. The inclusion criteria included research on handwriting analysis with keywords used for research being expert testimony, ink analysis, graphology, typography, and document and paper analysis. The inclusion criteria also included studies published as far back as the 1900s as long as they have relevant information on the history and evolution of handwriting analysis. The exclusion criteria were research papers that did not include quantitative and qualitative analysis of handwriting analysis.

Scientific Foundation Principles of Handwriting Analysis

There are basic scientific foundation principles of handwriting analysis that are used in forensic science. One principle is the principle of individuality. According to Fuglsby et al. (2020), the principle of uniqueness or individuality states that each individual has specific ways of writing that are not equal to the next person. This can be used to quantitatively and qualitatively analyze the differences, especially with suspected documents in a court case. The assumption is based on a 19th-century handwriting analysis conducted assessing two million individuals and in each case of examination, it was noted that each has a specific uniqueness in how they write their characters (Neto et al., 2021). A study was conducted to investigate the principle of individuality where 1500 individuals from the American general population were collected and entered into a database (Marcinowski, 2022). The sample population comprised both genders and diverse ages and ethnicities. Each individual was provided with three handwriting report sample papers to write their texts and the documents were assessed based on the structure, positional variations of the characters, letter and number combinations, stroke formation, writing movement, pen pressure, and slant. Using macro and micro-feature analysis, the study noted that there was 96% confidence that each person had a variation in how they write based on the features assessed. A similar test analysis was conducted as reported by Neto et al. (2021) indicating that handwriting analysis was similar and that every individual has a variation in how they write.

A second principle is variation. Osborn (1910) explains that no one person can write the same way even when allowed to have several repetitions of writing. The definition of this is known as natural variation. This is regarded as a second handwriting analysis feature based on the neuromuscular process (Marcinowski, 2022). Variation is a key factor in humans because it refers to the different ways one writes each letter. The reasoning is that the variation in performance is dependent on the neurological and cognitive capability to recall how to write the same type of letter over and over again with the same pressure and intensity alongside variation (Marcinowski, 2022).

The third principle is writing skills. In the United States of America, criminology experts review how a person writes based on their ability to reproduce the same letters with the same level of skill. The justification is that not everyone is capable of reproducing the same text equally thus, can help retrieve a distinction between forgery and real text (Guarnera et al., 2017). Therefore, based on

this principle of handwriting, the methodology of handwriting analysis at the forensic level can only impact evidence value based on aspects of expert testimony, ink analysis, handwriting analysis, typography, graphology, and paper analysis.

Quantitative and Qualitative Analysis of Handwriting

Forensic analysis of handwriting begins with an understanding of the characteristics of handwritten text which are conducted quantitatively and qualitatively. The qualitative characteristics are based on line quality, spacing, size consistency, continuity, connecting letters, letters complete, cursive and printed letters, pen pressure, slant, and writing movement (Marcinowski, 2022). Osborn (1910) cautions that prejudice and injustice can creep in when determining the genuineness of a suspect document in any court case proceeding. The author explains that an investigator must use competent judgment and counsel of intelligence to ensure that no unfairness is exhibited during the analysis and comparison phases. With this in mind, there are multiple combined approaches that can be implemented. These include expert testimony, ink analysis, handwriting, typography, and graphology among others.

Expert Testimony

Expert opinion in handwriting analysis is considered a fundamental aspect of analyzing disputed documents. A review of the literature suggests there are differing opinions regarding the accuracy and reliability of using expert opinion in handwriting analysis. One example is a study published by Hicklin et al. (2022) determined most handwriting analyses provide a false positive rate of 7.5% which means that most of the cases that require handwriting expert analysis often result in wrongful convictions. Nevertheless, there is a similar study analyzed that determined false negative rates to be lower at about 1.1% suggesting that the technique is more reliable in excluding suspects who do not write in a particular document compared to how it is positive in identifying the writer (Hicklin et al., 2022).

Another study conducted by the University of Zurich in Switzerland evaluated the reliability and accuracy of expert opinion in handwriting analysis (Martire et al., 2019). The research involved about thirty forensic handwriting experts from nine different countries asked to review ninety handwritten samples to determine if it was written by the same individual. The findings of the study indicated that the experts had an agreement of about 79.1% that the handwriting was not written by the same person (Martire et al., 2019). But, on further inquiry, there was a wide variation from an individualized expert opinion in determining that it was not written by the same person. The discussion provided by the analysts was that forensic experts tend to be more accurate in cases where the handwriting samples are of higher quality and less accurate when the quality is low or disguised (Martire et al., 2019).

Furthermore, the researchers noted that the experts' confidence in their opinions was often correct but, were less likely to admit uncertainty or error when proven to be incorrect. Overall, the conclusion to be determined is that expert handwriting analysts are crucial to providing the human aspect of forensic science based on their expertise and experiences. However, given that errors are bound to happen, as noted with false negatives and positives, it is recommended for the experts to work in conjunction with other handwriting analysis factors to enhance accuracy and reliability.

Ink Analysis

A document that is questioned contains various markings which can be in the form of handwriting, signature, computer printing, and typewriting (Osborn, 1910). The physical evaluation of the presented documents in history often used physical formats of evaluation, but in today's society, chemical examinations are more potent and reliable. Ink analysis is crucial in the examination process because two inks are considered to have different compositions, sources, and ages, and their use affects the age of the document in question (Osborn, 1910). In most cases, ink analysis compares dyes and organic solvents, gel-based inks, and water-based inks. There is a two-step process to this. The first is differentiating the ink physically based on color, and opacity, and the second is chemical analysis (Cicconi et al., 2020).

The chemical analysis involves various optical sources. The most used is a stereomicroscope which can determine the variation in the type of ink, and color or can determine additional markings generated due to the tip of the pen (Cicconi et al., 2020). Another approach is the optical examination using light sources such as UV radiation and infrared radiation. Thin layer chromatography is widely used through the extraction of the ink from the document and dissolved in solvents such as methanol, plated on a platform known as a TLC plate, and evaluated for the composition of the dyes present in the ink (Kapoor et al., 2021). Other approaches that have revolutionized ink analysis include capillary electrophoresis, infrared spectroscopy, liquid chromatography, laser desorption, and video spectral comparator.

Using the three-step procedure in handwriting analysis, forensic experts analyze ink in particular documents such as checks, contracts, or wills. The analysis is used by the experts to determine if the document is authentic or not. Using chemical analysis techniques, the ink's source, age, and use can be determined precisely based on the information provided. Therefore, ink analysis is considered a supplemental tool to expert testimony with regard to handwriting analysis.

Graphology

Graphology originates from graphometry analysis which is the forensic handwriting analytical technique involving the measurement and evaluation of various graphological features. Osborn (1910) explains that in each individual's writing capability, there is a uniqueness to how they shape, slant, space, and size their letters. This is what describes graphology. Graphometry analysis is particularly useful in cases where the handwriting in question is not easily recognizable or where the writers attempted to disguise their handwriting.

In 1996, a six-year-old JonBenét Ramsey was found murdered in her home, and a ransom note was discovered in the same vicinity as the body (Chaplin & Chaplin, 2023). The coroner reported that the cause of her death was asphyxia by strangulation associated with craniocerebral trauma. What was interesting was that the case became a media sensation with the belief that the parents, John and Patsy, were responsible for her death. The note discovered by Patsy appeared to have strong evidence of Ramsey's guilt. The three-hundred ransom note was assessed by comparing it was Ramsey's, John's, and Patsy's handwriting. The conclusion was that the note's handwriting was similar to Mrs. Ramsey's (Patsy's) handwriting (Chaplin & Chaplin, 2023). Items such as the letters 'q' and 'k' were found to be different. From the case, it is noted that how an individual writes their letters may appear in their forgery stance to copy another's writing (Chaplin & Chaplin, 2023). In other words, no matter how much one wants to appear similar in writing to another, it can never happen since, how each character's letter is written affects their writing capability.

But the case remains unsolved due to the inability of graphology to determine the precise comparison between the ransom note handwriting and the possibility of another individual writing the note. As such, Patsy was exonerated from the case rendering it an open cold case. In general, graphology is not considered a reliable forensic handwriting technique due to the lack of conclusive evidence in its analysis (Chaplin & Chaplin, 2023). One of the reasons that graphology is not considered a powerful tool is due to the subjectivity of the analysis. As noted earlier, expert testimonies are generally lacking and can have higher false positives than false negatives. In this criterion, the use of graphology is not widely accepted in court cases as it has no scientific validity as a reliable method of evidence. An additional reason is that graphology requires an assessment of large numbers of handwriting samples, control samples, and known and unknown handwriting samples for analysis. Furthermore, the writing of an individual based on their psychology and emotional state alters their letter-writing process (Chaplin & Chaplin, 2023). To counter this, emerging technologies such as Computer-aided graphology are used by graphologists to predict the personality traits of an individual. The technique is considered to be error-free and time saver since it can process images, remove extra pixels, and convert text into greyscale to investigate the extracted features of the text. There is software used by graphologists in this approach. The Theodore Robert 'Ted Bundy' case is an example of a legal case that used graphology to determine his handwriting associated with the murders of more than thirty women between 1974 and 1978. The personality trait extracted from the writings was that Ted was classified as a vain, selfish individual who focused on a sense of self-importance ("Role of Graphology in Forensic Investigation," 2021).

Typography and Document/Paper Analysis

Typography is described as the arrangement and design of typefaces in printed or digital text. Typography is implemented in handwriting analysis and can be used to assist in the analysis of altered or forged documents. The importance of typography and document analysis is identifying errors. The errors investigated include form, width, height, and stroke. There are three aspects that are investigated. These are fonts and typefaces which are the characters of a document such as Times New Roman and Open Sans with the idea of determining the diverse heights, styles, and widths. Another is leading, tracking, and kerning (Rodríguez-Rubio & Fernández-Quesada, 2020). Leading is the space between lines of text, kerning is the space between two individual characters whereas, tracking is the overall letter spacing of an entire word or passage of text (Rodríguez-Rubio & Fernández-Quesada, 2020). Further, typography and document analysis involve color examination where the color of the text is limited in the type of font print. Each font has a specific font color and is limited to its presentation. Errors in consistency, white space, and font space are also considered whereby, computer-generated analytical software is used to determine errors from the original document compared to the forged document.

Conclusion

The research has identified the critical aspects of handwriting analysis. The techniques of typography, graphology, expert testimony, handwriting analysis, and ink analysis. All these techniques are useful. However, based on the quantitative and qualitative evaluation of the literature, the most powerful techniques are handwriting analysis, ink analysis, and graphology. Expert testimonies and typography remain controversial due to the non-scientific validity in the processes to validate the credibility and reliability of evidence. The research has also highlighted the importance of using each technique together with other forensic investigation techniques to

enhance the credibility and reliability of evidence arguments in court cases. In conclusion, each technique is unique and can be used individually, however, based on the characteristics of handwriting as explained in the current research paper, the techniques can be used together to improve the credibility and reliability of the questioned documents in court cases.

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Enough Exemplars
Katherine M. Koppenhaver, CQDE-D

Once a writer has mastered the art of handwriting, his signature is executed smoothly and easily without conscious awareness of the characteristics of writing. Handwriting is executed without conscious attention to the method of writing. Writers concentrate on their message and not on the formation of the letters.

Your signature is the most frequently executed handwriting. When a forger attempts to copy a signature, he must slow down the writing act in order to match the letter forms of a model signature. If he writes too quickly, he will not capture enough characteristics. If he slows his writing in order to imitate the model signature the line quality deteriorates and the writing contains tremor and may look drawn instead of written.

A document examiner is frequently asked how many exemplars (known signatures) are needed to make an identification of a questioned signature or a determination that a signature is not genuine. The document examiner's needs will vary according to the circumstances. For example, more known signatures are needed if the writer has a wide range of variation or an oversimplified signature, while only a few signatures would suffice when the writer is consistent. Most people think that numerous signatures would be required in any case but there are circumstances in which a document examiner can give a definite opinion using only one known signature. There are also situations in which no known signatures are necessary. The type of problem addressed will influence the amount of comparable material needed for review.

When a fraudulent signature is a simple forgery, one exemplar should be sufficient to demonstrate the differences between the known and the questioned. A simple signature is one that is not based upon the victim's handwriting. It is prudent to obtain more than one signature, if available, but sometimes circumstances are such that it is not possible to obtain additional signatures.

When a questioned signature is written with a higher skill level than the known writer could execute, a single signature would be sufficient to determine the facts. For example, the signature of a person who never learned to write will not be a skilled writer.

When a questioned signature shows obvious signs of forgery not present in the known, one known signature is usually enough to prove non-genuineness. The signs of forgery are tremor, patching, pen lifts in unnatural places, and blobs of ink on the writing line. Forged writing often appears to have a drawn look.

There are several types of cases in which it is possible to identify fraudulent signatures without any exemplars. This frequently occurs when a spouse will sign their signature and their spouse's signature. When a questioned signature matches the handwriting of another writer, an identification can be made that the writing was penned by that individual. In this case, no known signatures are needed for comparison.

Albert Osborn addresses this in his book, *Questioned Documents*, when he writes, "Forged writing often shows striking inconsistency with itself in movement and thus contains evidence of unnaturalness that indicate a lack of genuineness without comparison with any other writing whatsoever."

Occasionally a signature contains so many obvious signs of forgery that its spuriousness is apparent. In these scenarios, it is probably better to have at least one known for comparison, although some knowledge of the writer would suffice to rule him out. Writers do not patch their signatures or write backward. Therefore, a signature that contains obvious patching is not genuine. A signature in which the lines cross

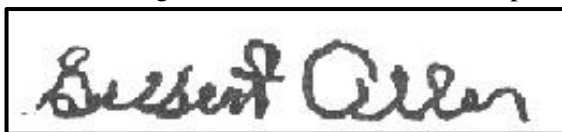


Figure 1

at the wrong direction indicating that it was written backward is not genuine. Some forgers try to imitate tremor as seen in Figure 1. However, their false tremor is too uniform to be genuine.

If a writer had an impediment that prevented him from writing in a normal manner, knowledge of that impediment would suffice to determine that a signature is not genuine. For example, the signature of a blind person was in question. The signature block on a form was very small and contained some printed letters. The signature not only stayed within the very small box, it curved around the printed letters, something a blind person could not do.

Since no one can write his signature exactly the same way twice, identical signatures are evidence of non-genuineness. This would include traced forgeries, scanned signatures or even free-hand simulations as well as cut and paste signatures. With electronic signatures being legal, it is possible to have the same signature on multiple documents. Writers can also use a signature stamp or an autopen thus creating duplicate signatures that may be genuine.

Traced forgeries can be identified without exemplars if there are two or more forged signatures that were copied from the same model or evidence of tracing is present in the suspect signature. Evidence of tracing the signature would be a groove or guide along the signature line. Signatures may be traced with a stylus or carbon paper. The forger places a piece of paper under the model signature and goes over the signature line. He removes the model signature and follows the indentations or carbon residue in order to reproduce the signature.

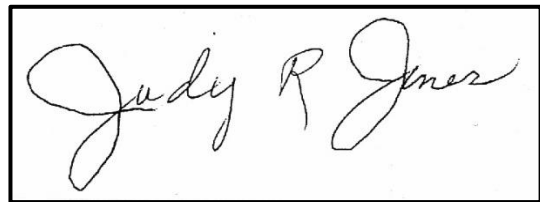


Figure 2

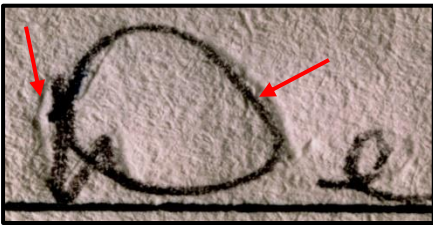


Figure 3

The forger will not follow the outline exactly so that there will be residue from the carbon or indentations in the paper as a result of tracing. Therefore, carbon residue or a groove along the signature line indicate traced forgeries. Forgers are scanning genuine signatures into a computer and printing them on their colored ink jet printers in order to pass them their fraudulent nature.

A signature that is cut from one document and pasted onto another can sometimes be detected from the nature of the document. If the forger is sloppy, there may be shadows around the signature or pieces of the original document mingled with the new document. If the forger presents another document containing the same signature, the nature of the forgery is evident. Misalignment, trashmarks and shadows often can be found on cut and paste documents.

It is important to obtain sufficient knowledge about a writer that will enable a document examiner to draw conclusions. For example, a person who is too ill or infirm to write could not execute a highly-skilled signature. Knowing that the writer couldn't write is important information when one gives opinions about handwriting. A signature of a person who is on his deathbed will generally show deterioration. Signatures have been presented as authentic which were written after a person died. Knowing that a person is illiterate is also important information, especially if there are no known signatures and the questioned signature is obviously penned by a skilled writer.

There are many cases in which a document examiner would want to obtain numerous signatures for comparison with material in question. The average number of recommended signatures is 20 to 25 under normal circumstances and four to five pages of handwriting. Occasionally a document examiner will want more than 25 signatures especially when the signature is oversimplified. In these cases, 100 signatures may not be enough. This would hold true in many situations.

Enough Exemplars

Katherine M. Koppenhaver, CQDE-D

Documents should be gathered that are similar in nature to the questioned signatures dated around the same time as the questioned. A combination of requested and collected signatures should be used.

The document examiner should request original exemplars for comparison purposes. Carbon copies are better than photocopies although it is difficult to assess pressure patterns from carbon copies and it is impossible to determine line direction. Photocopies of carbon copies are generally unacceptable for drawing conclusions about a writer.

Photocopies can be used when originals are not available but a conditional opinion should be given when working from photocopies. Your opinion is subject to review of the of the originals. If the photocopy is an accurate reproduction of the original, the document examiner's opinion will be accurate.

There are several problems with photocopies. First a photocopy can be a cut and paste which may not be detectable. Second, photocopies are subject to drop out and each succeeding generation shows more deterioration. It is not possible to distinguish between drop out and pen lifts in multi-generational photocopies.

Faxed documents also have many problems when used for identification. Faxing distorts signatures and creates a jagged line where there should be a smooth line. This is most obvious on diagonal lines. Faxed copies also suffer from drop out. Photocopies of faxed copies make poor exemplars.

The document examiner should make every effort to obtain documents that are suitable for comparison purposes. In most cases, originals can be obtained and it is up to the document examiner to insist upon originals.

Unless the document examiner sees the writer execute all of his signatures, he needs to compare all of the signatures that have been identified as authentic for internal consistency. Sometimes signatures presented as genuine are not. This is more prevalent when the writer is elderly and/or infirm. Authorization is given to a caregiver or a spouse to sign the elderly person's signature on normal course of business documents such as checks. These documents must be recognized as not representative of the writer.

If a known signature is inconsistent with other known signatures, document examiners should ask if this signature was written under unusual circumstances or executed by another person.

Many factors can influence a signature. These include factors related to the writer or to the writing environment. The writer may have a health problem, be taking medication that affects his writing, be under the influence of drugs or alcohol or be under emotional stress. Environmental factors include lightning, position of the writer (standing, sitting or prone), the type of writing instrument and the writing surface.

The document examiner must also consider accidentals. Did someone jostle the writer while he was signing his name? Did the writer sign on the steering wheel of his car or place the document on a wall to write? It is the responsibility of the document examiner to discover any extenuating circumstances that will affect the writing.

A document examiner may be asked to identify the known writing. The document examiner must observe the writing act in order to be able to identify the exemplars as being written by an individual.

It is usually easier to make an identification of a writer than to eliminate him. An identification requires significant similarities between the known and questioned documents. An elimination requires that the document examiner know all of the ways in which a writer can write. Document examiners rarely have access to all of the various ways in which a writer can write. Of course, when obvious signs of forgery are

Enough Exemplars

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present, the document examiner can give an opinion of spuriousness unless those characteristics are found in the known writer's handwriting.

The number of exemplars needed in each case that a document examiner studies, will have to be determined from various factors affecting the case.

Keep in mind that a non-genuine signature may not be a forgery. In fact, document examiners should avoid using the term, forgery. Every crime has elements and one of the elements of forgery is the intent to deprive a person by signing their signature. Therefore, we use the term, non-genuine or spurious when describing a questioned signature.

Experiments with Handwriting
Robert Saudek

Robert Saudek was an experimental graphologist who spent 26 years investigating handwriting before he wrote his book, *Experiments with Handwriting*. Saudek discusses the development of writing in young children to graphic maturity which occurs around the time of puberty.

Robert Saudek describes the factors involved in learning to write. First is the power or observation which he rephrases as visual impressionability. Children see the letters of the alphabet in many different situations and they develop their own idea about how a letter should look. This is one of the reasons that everyone writes differently.

Learning to write involves the attempt to reproduce the letters that children see. Saudek refers to this as the “capacity for graphic expression. It involves being able to control one’s muscles to duplicate the letter designs. Coloring in the lines of a picture helps young children learn control of their muscles so they are actually beginning to learn to write when they start drawing.

The final obstacle to learning to write involves learning to control the writing instrument. School systems eliminated Penmanship Classes considering that children did not need to learn to write. Students were taught to print when they start school but they no longer learn cursive in the second or third grade. Children are no longer taught how to hold the writing instrument. Lately however, some schools are re-introducing penmanship as a subject.

Certain characteristics occur in the writing of children. For example, some letters are made backward, some contain extra strokes and all of the letters sit at various levels instead of being on a straight line.

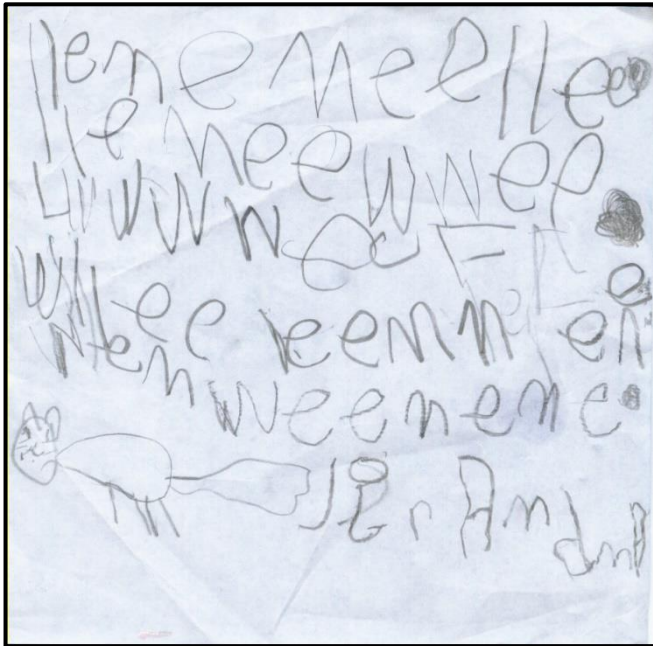


Figure 1 – Preschool writing

Saudek lists the requirements that we must meet in order to be able to write fluently.

They are:

- 1) when the sound of the letter evokes its mental image,
- 2) when we have unimpeded control of the writing instruments,
- 3) when our performance is free from any physical impediment,
- 4) when we can spell the words easily and
- 5) when we are intent on the content of our writing and ignore the act of writing. The greater the fluency of the writer, the further the salient features diverge from the school copy.

All the peculiarities of any handwriting are dependent on the following natural laws or

All the peculiarities of any handwriting are dependent on the following natural laws or facts of their accompanying circumstances. The twelve factors responsible for the formation of our letters are:

Experiments with Handwriting
Robert Saudek

- 1) The mechanical means (pen, ink, paper).
- 2) The degree of graphic maturity.
- 3) The degree of speed of the act of writing (actual intensity of the stroke, letter, word or sentence impulse.)
- 4) The school copy from which we first learned to write.
- 5) The nationality of the writer, and the national environment in which he is a presently living or has previously lived for any length of time.
- 6) The individual degree of visual impressionability.
- 7) Power of graphic expression (conditioned by the visual memory and manual dexterity.)
- 8) The degree of the writer's vanity, affectation and desire to imitate others on the one hand or his naturalness and unaffectedness on the other.
- 9) Degree of cultivation, knowledge of foreign languages, foreign styles of handwriting and foreign countries.
- 10) The acute physiological condition of the writer.
- 11) Chronic physical impediments.
- 12) The circumstance whether the letter in question stands alone or at the beginning or the end of the word (that is, whether an adjacent letter stands to the right or the left of it or on either side) and whether the final direction of the movement of the preceding letter and beginning of the movement of the letter just written, as well as the final

We are able to write fluently when we the sound of the letter evokes a graphic image in our minds and we have no doubt of the spelling of the word. We concentrate on the message instead of conscious awareness of the act of writing.

A Case of Disguise

An employee in a company was receiving threatening anonymous letters from a fellow employee. The building was secure and visitors could not enter the building unescorted. The company hired a me to identify the culprit. They could not ignore the threats in the letters.

Five letters had been received in a two-month period. The letters took up a full sheet of paper so there was a lot of handwriting available. However, the disguise was excellent. The writer twisted the loops and wavered his lines to avoid revealing his habits - so he thought.

Employees records were compared with special emphasis to the people who worked in the same room. The victim's handwriting was also examined.

The employees knew that an investigation was being conducted. During the investigation, two more letters surfaced as if the perpetrator was convinced that we could not catch him because of the skill of his disguise.

The examination of all of the questioned material revealed two things. First of all, some of the anonymous writing was not disguised. The writer failed to maintain his disguise completely and natural writing was extracted from the disguised material. The letter showing the least disguise was a lowercase "k."

The second discovery was indented handprinting on one page of questioned material. This printing was not disguised. Side-lighting revealed the numerous indentations and the indented writing was photographed using side-lighting.

The recipient of the letters became the principal suspect. There were several supporting reasons outside of handwriting identification. First, the company had installed a security camera in hopes of identifying the culprit when he left another note. The security camera didn't work indicating that the culprit knew about the camera and avoided it.

The notes contained very specific information from staff meetings not available to outsiders. No one was seen in the area around the time that the notes were left. The other employees would have noticed an outsider coming into their area.

The indented writing matched the handprinting of the recipient of the notes. The undisguised portions of the handwriting. Even though the culprit used an elaborate method of disguise, his handwriting still gave him away.

The document examiner must always look at the writing of the victim in anonymous letter cases. The victim uses anonymous letters to get attention. In this case, the writer felt slighted because he got a promotion and not a raise. The letters referred to his "stupidity" in continuing to work and "allow himself to be taken advantage of by the establishment." The letters also contained much vulgar language and very negative name calling.

The person who attempts to disguise his letters must take into consideration that if he alters the letters too much, the writing cannot be read. In this case, the writing was well-disguised and also difficult to read. Some of it could not be easily deciphered.

A Case of Disguise

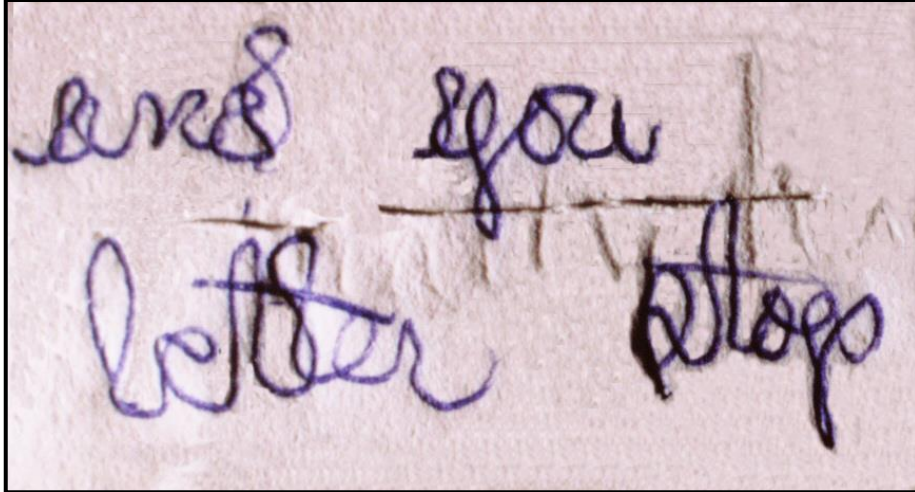


Figure 1

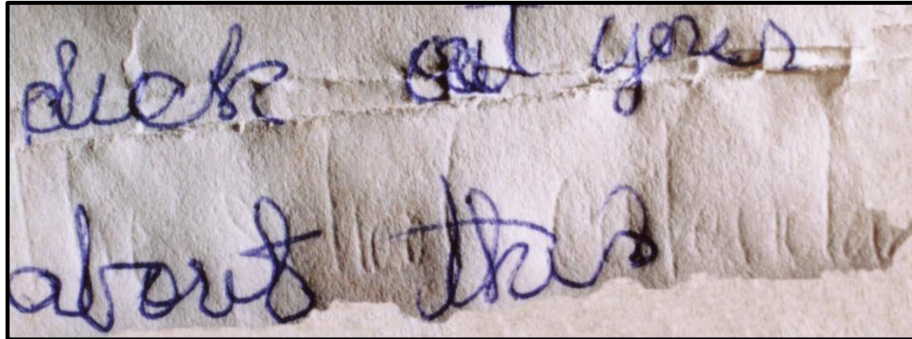


Figure 2



Figure 3