



Some Reasons for Qualified Conclusions

The examination and comparison of handwriting to identify a writer is a reliable means of identification. It is reliable when the Forensic Document Examiner (FDE) properly, accurately, and conservatively applies the established principles of handwriting and hand printing identification that have been found to be true and correct over the years. The principles are well documented in numerous text and papers written over the years by qualified, competent, and ethical FDE's in many countries. A discussion of those principles is beyond the scope of this paper.

Reaching an unqualified conclusion about the identity or elimination of a writer must be supported by the observable evidence in the examined writings. In fact, in most cases the evidence does not support an unqualified conclusion. The purpose of this paper is to discuss some of the reasons for not being able to reach an unqualified conclusion.

On those occasions when the observable evidence does not support either an unqualified conclusion of authorship or the absolute elimination of a writer, the FDE must use qualifying terms and statements to accurately convey the degree of belief he does have. His conclusion, and the reason for it, must be based on the totality of the observable evidence in the examined writing. The principle is:

Identification or elimination of a writer is based on the cumulative effect of all the available observable evidence in the examined writing and not on the presence or absence of any single characteristic, quality or feature in the writing.

What is the basis for identifying a writer? The identification of a writer can only be reached when there is complete agreement in all the characteristics, qualities and features of the examined writing that are important for identification. Additionally, there can be no significant or irreconcilable differences between the examined questioned and known writing. A significant difference, as defined in the American Society of Testing and Materials (ASTM) standard—E 2290-03—is "...an individualizing characteristic that is structurally divergent between handwritten items, that is outside the range of variation of the writer, and that cannot be reasonably explained."¹

Identification of a writer requires conclusive supporting evidence. The ASTM standard for the term identification states: "...this is the highest degree of confidence expressed by document examiners in handwriting comparison. The examiner has no reservations whatever, and although prohibited from using the word 'fact,' the examiner is certain, based on evidence contained in the handwriting, that the writer of the known material actually wrote the writing in question."²

The presence of a single, significant or irreconcilable difference does not provide a basis for concluding that two writings are by different writers. It does provide a basis for nonidentity of the writer whose known writing is being compared to the questioned writing. Nonidentity is not the same as eliminating a writer.

¹ ASTM Standard, Designation: E 2290-03, "Standard Guide for Examination of Handwritten Items," page 2, section 3, paragraph 3.3.11.

² ASTM Standard, Designation: E 1658-04, "Standard Terminology for Expressing Conclusions of Forensic Document Examiners, page 1, section 4, paragraph 4.1.

Nonidentity does not mean that the writer of the known **did not** write, or is eliminated as, the writer of the questioned writing. The word “non,” when used as a prefix, means “not.” Therefore, nonidentity means that the two writings are not the same. Not that the writer of the known **did not** write, or is eliminated as, the writer of the questioned. The conclusion reached in any examination and comparison must be based on the significance of the consistent combination of characteristics, qualities, and features observed in the writing during the examination and comparison.

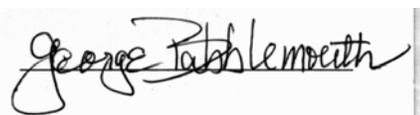
The reason a writer cannot be eliminated in every case is that there may not be sufficient evidence within the examined writings to reach that absolute conclusion. The examination and comparison may result in finding sufficient significant agreement or differences in the consistent and combined characteristics, qualities, and features of the writing to reach a qualified conclusion for or against the examined writings being written by the same writer. In other words, the observable evidence might lead to some degree of belief less than certainty that the writer of the known did or did not write the questioned writing.

What is the standard for eliminating a known writer? That at no time did the writer have the skill or ability, nor did he incorporate in his known writing the same consistent combination of characteristics, qualities, and features found in the questioned writing. As a general rule, the quantity of known writing necessary to eliminate a writer is greater than that necessary to identify a writer. To eliminate a writer, the submitted known writing must be representative of the full range of the writer’s skill, graphic maturity, and variability. This must be the standard applied in every case. The word elimination means that the writer of the known writing could not and did not write the questioned writing. The evidence to support such a strong conclusion must be unequivocal.

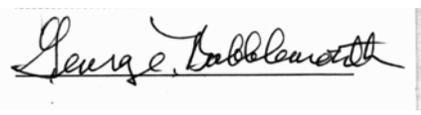
If there is one, or even several, significant and repetitive similarities present in the examined writing, the process of determining the writer’s identity has begun. In like manner, the presence of one or more significant differences only means that this is the beginning of the process of establishing a basis for concluding that the writings are by different writers. **Again, nonidentity is not the elimination of a writer!**

As a general principle: It is far more difficult to eliminate a writer than it is to identify one.

Can writers write more than one style of writing? Yes! Most writers are able to write completely different styles of writing at will for either short or extended periods. The following two signatures illustrate this point.



Signature No. 1



Signature No. 2

Figure 1

In this example, these two signatures have numerous differences, many of them significant differences, in style of the of the writing, letter forms and connecting strokes, plus many other characteristics, qualities, and features. **Yet, they are by the same writer.** Determining whether the differences between these two signatures are significant enough to conclude that they are by two different writers, or irreconcilable with the available writing for examination, is actually a major concern in this example. If Signature No. 2 is the questioned signature and the FDE has for examination purposes only known writing in the style of Signature No. 1, he would not have a justifiable basis to conclude that the known writer did not write Signature No. 2. Based on the evidence present in this instance, the only conclusion he can support is that with the available material there is no evidence of significance to indicate the two signatures are by the same writer. That is not the same as saying the two signatures are by two different writers. The observable evidence present in this instance does not support an unqualified conclusion or complete elimination. The same would be true if the FDE had only known writing in the style of Signature No. 2 for comparison and the questioned signature was Signature No. 1.³

³ Morris, Ron N. (2000) *Forensic Handwriting Identification/Fundamental concepts and principles*, London, Academic Press. The illustrations come from this reference, the text below them was written for this paper.

To identify a writer, the examined questioned and known writing must be consistent in style, representative of the writer's level of graphic maturity, normal range of variation, and contain sufficient individuality to separate his writing from others who write the same style or system of writing. They must also be suitable for comparison purposes and contain sufficient class and individual characteristics in common to reach a positive determination of authorship. Typically, writing on photocopies, faxes, or digital reproduction from low resolution scans do not contain sufficient class and individual characteristics to determine the writer's identity. Additionally, the fact that document fabrication is so easy with these technologies, the conclusions reached concerning the writer's identity only apply to the copy and not to the original the copy purports to represent.

The known writings must consist of the same letters and letter combinations in the questioned writing and in sufficient number to accurately evaluate the writing habits of the writer. These same letters and letter combinations in the questioned and known writing must be in complete agreement in all their characteristics, qualities, and features to reach the unqualified conclusion. They must also be representative of the writer's normal range of variation, and every detail supports the conclusion that they are by the same writer.

Similarities in some characteristics, qualities, and features of one writer are also found in the writing of one or many more other writers. These common characteristics are usually referred to as class characteristics. However, the significance that can be attached to these common similarities is determined by:

1. The frequency of their occurrence in random writing.
2. The context in which they appear (Do they stand alone or in what combination are they written)
3. And, their importance when considered in combination with all of the other similarities and differences in the examined writings.

The reason similarities are found in the writing of many different people is because the members of a group who have a common language and alphabet usually learn to write similar systems so they can communicate in their common language. As part of their maturing process, they learn to make similar, but not necessarily identical, letterforms. These common learned characteristics have a frequency of occurrence in random writings. It is this frequency of occurrence in their random writings that, in part, establishes the significance that can be attached to each characteristic, quality, and feature in any one writer's writing.

Additionally, it is because of these common characteristics among writers that the FDE is not always able to reach a positive determination of the writer's identity or eliminate his as a possible writer. This forms the basis for the first reason why the FDE is not always able to reach an unqualified conclusion.

I. Adequacy of the submitted writing

A. *Insufficient writing for comparison*

Either the questioned or known writing, or both, may be insufficient for a completely meaningful examination and comparison. The sufficiency and suitability of the writing to be examined determines the limits imposed on the FDE in conducting the examination and comparison. They will also determine the certainty of the conclusion reached by the FDE based on the available evidence within the examined writing.

Typically, writing is insufficient for identification or elimination of a writer if the characteristics, qualities, and features of the writing lack:

1. Sufficient individuality, i.e., the name is “Hill,” “Doe,” or some other very limited combination of letters and letter combinations
2. The writing is limited to initials of one or two letters
3. In some cases unnatural or disguised writing
4. The questioned writing is a simulation and tracing of another persons writing
5. The presence of patching and retouching in the questioned writing that is not explainable or an irreconcilable difference
6. Completely different styles of writing
7. Or, other examples of writing that may be insufficient for a completely meaningful examination and comparison. **Each case must be evaluated on its own merit.**

B. *Insufficient known writing*

The known writing is insufficient in quantity or is of marginal value for comparison purposes, if it does not repeat the questioned material or have sufficient repetitions of the same letters and letter combinations an adequate number of times to establish the writer’s habits.

If the known writing does not repeat the questioned writing, then it must have a sufficient number of repetitions of the same letters and letter combinations found in the questioned writing to establish the writer’s habits. Cursive writing can only be compared with cursive, hand printing with hand printing, upper case with upper case, lower case with lower case, and numerals with numerals. When the writer uses some combination of upper and lower case letters, printing and cursive forms, only the common forms, their characteristics, qualities, and features, can be compared with each other. The only exception is if the writing is in a manuscript style where cursive and printed forms are mixed together, then the common individual letters and letter combinations can be compared with each other.

The known writing may also be insufficient if some of it is not contemporaneous with the questioned writing, written on similar documents, or under similar circumstances. It is not always necessary to have contemporaneous writing for comparison purposes. Each case must be evaluated on its own merits and what is necessary for a meaningful examination and comparison.

One thing is certain, it is only when like letters and letter combinations, characteristics, qualities and features, etc., are present in sufficient quantity in the known writing for comparison to the their counterparts in the questioned writing, that a meaningful examination and comparison is possible.

- C. *A lack of sufficient individuality*
Individuality in writing is defined as the combination of those class and individual characteristics that separates one person's writing from another. It is the combination of all the characteristics, qualities, and features of the writing. If there is agreement in many of the class and individual characteristics, but there are also irreconcilable differences because of a lack of individuality, a qualified conclusion may be all that is possible. Figure 2 shows a questioned writing having a stylized "R." The known writing does not have the same letter form. The lack of individuality in the known examples of this letter would be sufficient for a qualified conclusion. (In fact, the same writer wrote both the questioned and known, but without known writing having sufficient individuality, only a qualified conclusion can be supported.)



Figure 2

Just because the individuality differences in this example are irreconcilable with the examined writing, it does not mean they are significant enough to provide a basis for eliminating the known writer. In some instances, such as here, the additional known writing may provide the basis for a less qualified conclusion. In another instance the decision that a difference is significant or irreconcilable may not be resolved even if additional known writings are obtained and examined.

If the irreconcilable or purported significant difference in the questioned writing is the result of a transitory factor, then no amount of additional known writing may be of value in resolving the status of the difference.

II. Transitory factors

- A. *Transitory factors and accidental features*
A transitory factor is one that temporarily alters or impedes the writer's motor function during the act of writing. It may be caused by a malfunction of the writing instrument, a sudden change in the writing surface or writing position, carelessness when writing, the affect of alcohol and drugs, illness, injury, other temporary physical factors, etc. Not all writers are affected in the same way by the same transitory factor. Nor do they compensate for the effects of the transitory factor the same way.

A type of transitory factor is known as an accidental. Accidental features are usually caused by carelessness while writing and almost always have no counterpart. When they are in the questioned writing, it may not be possible to find known writing having the same or similar characteristic, quality, or feature.

In every case and with every writer, transitory and accidental features must be evaluated individually. If the FDE finds that he is attributing a significant number of the irreconcilable differences between the questioned and known writing to transitory or accidental features, in all probability he will reach the wrong conclusion. That is one reason why it is very hazardous to attribute to an irreconcilable difference that is the result of a transitory factor or accidental feature. As with all characteristics, qualities, and features there must be observable evidence in the writing to support this conclusion and that the difference cannot be attributed to any other cause.

III. Deliberation

A. *Disguised writing*

Disguised writing is written by a writer with deliberation and intent. He deliberately and with intent alters his writing for the purpose of avoiding detection. Not all writers are successful when attempting to disguise their writing. Each case of suspected disguise must be decided on the observable evidence present in the examined writing.

Determining the writer's intent, based solely on the examined writing, is difficult and sometimes impossible. Look again at Figure 1. If this writer was to write the questioned signature in Style 1 and all of the known was in Style 2, it would be a stretch to conclude that the reason was to disguise his writing. There is no evidence in the Style 2 writing to conclude that it is disguised. A change in writing style alone is not sufficient to conclude that the writer is deliberately and with intent disguising his writing. The writer of the two styles shown in Figure 1 was not deliberately trying to disguise his writing or avoid detection. To conclude such would be wrong.

To safely reach the conclusion that writing is disguised, it must have a combination of the following characteristics, qualities, and features. The writing must exhibit extreme inconsistencies in the following combination of characteristics, qualities, and features:

1. The overall slant of the writing and between common individual letters and letter combinations
2. The relative speed of the writing
3. The style, shape, and details of common letters and letter combinations
4. The relative overall size of the writing and repetitions of common letters and letter combinations.

Inconsistencies in one or two of these characteristics, qualities, and features are not sufficient to conclude the writing is disguised. The inconsistency must exist throughout the writing. In every case where a statement is made that the writing is disguised, the evidence of disguise must be as conclusive and just as persuasive as that required for an identification or elimination of a writer.

Writing can be unnatural and still not disguised. For example, when the writing is writing under the influence of drugs, alcohol, on a rough writing surface, in an unusual writing position, etc., his writing may be unnaturally written, but not disguised.

B. *Writing produced by simulation or tracing*

A simulation is defined as the attempt by one writer to imitate the handwriting habits of another writer by drawing letters and letter combinations as written by the former. The drawing can be done from a model or from memory.

In some situations handwriting habits of the simulator may be incorporated in the drawing or simulation. This usually occurs in poor quality simulations where the normal writing of the simulator and the model writing he is trying to copy may not significantly differ. Even when this inclusion of normal handwriting habits occurs, it is seldom possible to identify the writer of the simulation based on the writer's habits. The similarities present are usually outweighed by the significance of the differences and, therefore, are of limited value for identification purposes.

A tracing is the meticulous copying of handwriting habits while using a model as a guide. One method of tracing a model signature is using transmitted light, such as a window or light box. Here, the model signature is placed on the light source first and a second sheet of paper, on which the traced writing is written, is placed over the model. The tracer then uses a pen or pencil to follow the outline of the model writing.

Another method of tracing is to place the model signature on top of the second sheet of paper and place both on a soft surface. The tracer then follows the outline of the original writing, pressing hard on the model writing to make an indentation in the second sheet. This indented outline is then overwritten or filled in by the tracer. This tracing process is known as an indented outline tracing. Depending on the method used and the evidence present, it may be possible to determine which of these processes was used to trace the writing.

As a general principle, the writer of a tracing can never be identified through handwriting, because by definition he is not incorporating any of his own handwriting habits into what he is drawing; he is simply following or adhering to an outline of someone else's writing.

IV. Photocopies, faxes, and digitally produced writing and documents

A. *The examination of copies*

In the following discussion, the word "copy" refers to a photocopy, fax, or any type of digitally generated document where the writing was scanned into a database, recalled, and printed on a printer. Some FDE's hold that a computer generated document is the original. That is true, if, in fact, the text of the document was generated on the computer and that text is printed. However, it is not true if the document contains handwriting that was scanned into a database, attached to the document in its creation within the computer, and the combination text and handwriting printed. The text is original, the handwriting is not.

The process of producing a photocopy or a fax is essentially the same as that described above. The source document is scanned and converted to a new document purportedly reproducing the source.

Notwithstanding the improvements in photocopiers, scanners, computer software, etc., scanned writing will not contain all of the characteristics, qualities, and features of the original writing. Additionally, the output device, the printer, ultimately defines the quality of the final image. If the printer is set to print an image of 300 dpi, scanning the original at 1,200 ppi provides no real improvement in the quality of the copy. If the scanning is done at 75 ppi and the printer is set for an output of 300 dpi, the quality of the image is not improved.



Figure 3

Figure 3 shows the same image scanned at 25, 50, 75, and 300 ppi. The improvement in the quality of the image at higher scan rates is evident. When printed using a color laser printer set at 600 X 600 dpi, the image quality differences are dramatic. Even though the 300 ppi scanned image is the best quality image, not all of the details on the scanned original can be seen, specifically, details in the art work, the actual color of the ink (it is black) and the writing pressure used by the writer. Figure 3 shows four two-dimensional images not the three-dimensional image of the writing.

In any case, where the original document is allegedly not available for examination and only a copy is, the suitability of the writing on the available copy is going to be problematic (Figures 3 and 4). Why? Because, copies does not record all the observable evidence on the original. Figure 4A is a photocopy made on an analog copier of the same material shown in Figure 3. Figure 4B is a grayscale scan at 75 ppi of the same material. An examination and comparison of these different images, Figure 3 and Figure 4, will help to demonstrate why working with copies can be problematic.

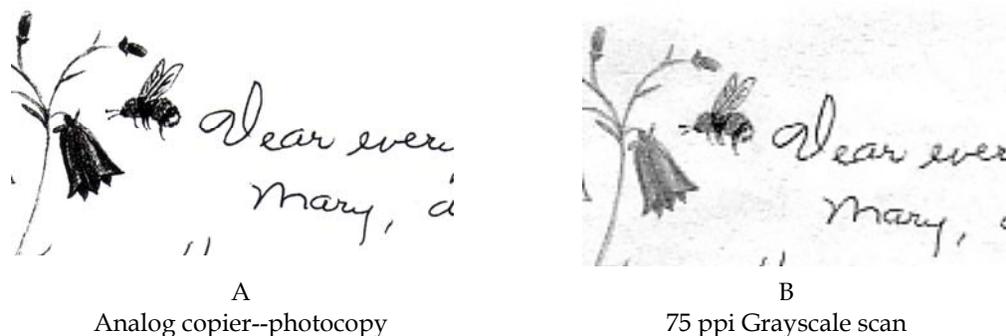


Figure 4

Depending on the quality of the copy and its generation, the accuracy of the reproduction of characteristics, qualities, and features, on that copy can vary extensively. Photocopies can be first, second, third, fourth, or more generations from the original document. A first generation copy is one made directly from the original. The second generation copy is the one made using the first generation copy as the source document when copying. The third generation copy is a copy of the second generation copy, etc. With each succeeding generation, the original material decreases in quality. Therefore, depending on the quality of the copy, regardless of its generation, it may not be possible to conduct a truly meaningful examination and comparison of the writing on that copy.

In some cases, the line quality found on a first, second, or third generation copy may be very good, marginal, or poor. One of the factors that can affect the accurate copying of line quality is the color of the ink on the original. Experience has shown that some blue inks do not copy as well as others. When the original writing is in one of these blue inks, even the first generation copy can appear to be poor. Black ink original writing tends to reproduce better.

Great improvements have been made in copier technology and the copies they make. Many times features, such as line quality, are copied relatively accurately; however, some equally delicate features of the writing, such as changes in pen direction, details in capping of letters, delicate retouching, etc., are not always recorded on the copy.

The only writing that absolutely and unequivocally contains all of the characteristics, qualities, and features important for identification or elimination of a writer is the original writing, pen on paper. The assumption is that the original writing has sufficient individuality to arrive at either one of these conclusion. Anything less than the evidence present in the original writing, meaning any type of copy, must be evaluated on an individual basis.

As a general principle, when examining any copy, the FDE must consider the probability that the submitted copy could be a fabricated document, notwithstanding good line quality and apparent clarity of the writing on the copy. Any opinion, unqualified or qualified, rendered concerning the identity of the writer of a copy, regardless of how good the copy quality, is based on the observable evidence on the copy and only applies to the examined copy, **not** the original. At no time can the examination and resulting opinion concerning a copy be inferred or attributed to the original that copy purports to represent without conducting an examination and comparison of the original and the copy.

This precaution is necessary, because evidence of added material, altered material, a tracing, a simulation, fabrication of a signature, or the use of a computer and scanner to store and manipulate writing or other material, may not be present on the copy. One of the side effects of improved photocopiers and computer technology is that the evidence of document fabrication using these technologies is not as easy to determine.

If a computer generated document consists of several pages of text, it is possible to change elements of one or more of the pages and substitute the modified page in the package. Substitution of pages in a multiple page document is not unheard of. Evidence of page substitution can sometimes be found in the examination of a multiple page document. Occasionally, it is not possible to determine that a page substitution has occurred. This is another reason for having the original document for examination and comparison.

Summary

There are numerous reasons for reaching a qualified conclusion concerning the authorship of the writing. Some of them have been discussed above. When the evidence is less than conclusive, as it frequently is, the competent, qualified, ethical, and conservative examiner will reach a qualified conclusion. If one or more of the examined documents is a photocopy or computer generated document, the FDE has a responsibility to advise his client that the fabrication of documents is extremely easy. He must also advise him that any opinion rendered based on the examined copy only applies to the copy, not to the original the copy purports to represent. Because photocopying, and most other copying processes do not reproduce all the evidence on the original document the FDE must, if possible, examine the original. If the evidence on both the original and copy are in complete agreement the opinion rendered based on the observable evidence on the copy may not change. In those situations where evidence is found on the original document that is not present on the copy then the FDE reserves the right to render a new opinion based on the examination of the original document. At no time does the opinion rendered, based on the examination of a copy, authenticate the original document the copy purports to represent. That can only be accomplished by an examination of the original.

All examination and comparison procedures and the language used to report the results of that work should conform to the appropriate ASTM standards for the forensic examination of documents.