

Robert G. Foley,<sup>1</sup> M.S., M.A., J.D.

## Characteristics of Synchronous Sequential Signatures

---

**REFERENCE:** Foley, R. G., "Characteristics of Synchronous Sequential Signatures," *Journal of Forensic Sciences*, JFSCA, Vol. 32, No. 1, Jan. 1987, pp. 121-129.

**ABSTRACT:** A comprehensive look at some common handwriting characteristics and telltale signs that would assist questioned document examiners in attempting reasonably to predict whether or not two or more signatures were signed at the same time or at different times.

**KEYWORDS:** questioned documents, signatures, synchronism, sequence

The question as to whether or not a group or series of signatures signed by the same person were signed on one or more documents in a continuous and uninterrupted manner often arises. In these cases, more often than not, the genuineness of said signatures is not disputed. Generally, the question is whether one or more of the group signatures were signed at or about the same time the other member signatures were signed or at some other time.

Most examiners, whether because of the lack of experience or the lack of published reference literature, find they know neither how to approach such problems nor how to develop or interpret the value of possible latent evidence. The problem, as stated, cannot always be answered in a satisfactory fashion, even by examiners with extensive experience. A good bit of valuable information dealing with such problems, most of which is unpublished and unrecorded, has been exchanged. In many instances, the information formulated has been a direct result of case examination. However, none of this valuable information has heretofore been compiled, verified experimentally, and documented.

Thus, the purpose of this work was to examine groups or series of known nonspurious signatures that were signed in a continuous, uninterrupted manner with the intention of formulating characteristic trends, generalities, or telltale signs. Once documented, these identifiable characteristics could then be used as reference observations to resolve future similar cases.

Webster's dictionary defines synchronous as "concerned with the complex of events existing in a limited time period, contemporaneous or occurring at the same time." It further defines sequential as "in a sequence." It defines sequence as "a continuous or connected series."

For the purposes of this investigation, it is deemed that the synchronic sequential period ends whenever there is a change in the external and internal influences on the signer which is also generally coupled with a complete change in writing position.

The following are examples of typical cases where one would expect to encounter the ques-

Presented at the 38th Annual Meeting of the American Academy of Forensic Sciences, New Orleans, LA, 10-15 Feb. 1986. Received for publication 21 Feb. 1986; accepted for publication 18 March 1986.

<sup>1</sup>Forensic document examiner, West Monroe, LA.

tion as to whether a series of signatures were all signed at the same time as opposed to signatures signed noncontemporaneously, that is, not all at the same time, without interruption.

1. Testaments in statutory form where the law requires that the testator sign each and every page one right after the other without interruption.

2. Medical records, diaries, taxes, monitoring, and ship's logs are documents that, when prepared during the normal course of business, are generally signed or written over a number of different occasions. In some cases, however, said records and logs are spuriously fabricated or signed or both all at one time for self-serving purposes.

3. With contracts, the question will occasionally arise whether or not various stipulations or provisions contained therein were approved all at the same time or not, such as:

(a) whether or not an uninsured motorist's waiver or selection of lower limits form was signed at the same time the main application and other forms of insurance were signed and

(b) whether or not an endorsement and maker signature of a promissory note were executed at the same time or over different times. This becomes important when the maker or endorser of said note asserts that he endorsed the note at a different time under conditions of duress. Holder of note contends that said note was issued and endorsed at the same time. This type case often arises when there is an attempt made to bump a foreclosure matter out of executory proceedings into ordinary proceedings as a result of lack of proper formality.

4. Initialing of time cards. The time cards were offered to substantiate overtime reported to have been performed by employee. It was determined through a great degree of consistency and unnatural regularity of position, pressure, size, and very low degree of variation between said initials that the questioned initials were perfected all at the same time rather than over different dates as so stated.

5. Stock certificates—where there was no issue as to whether or not one signed their signature on a stock transfer certificate, but rather, when the signing occurred. The stockholder contended that he did not knowingly sign the questioned stock certificate. But the stockholder did admit if the signature was genuine that the signing of the questioned stock certificate must have occurred at the same time he signed a stack of other stock certificates concerning transfer of stock in a different corporation.

6. Prescriptions—a doctor contends he did not sign, all at the same time, a number of blank prescriptions, but rather, individually, over numerous, different occasions. This became important in a case alleging said doctor was negligent and his conduct dropped below the standard of care expected for his profession in a malpractice action.

7. Another similar case as cited in Case 6 existed; however, this involved a criminal matter where a doctor was charged with issuing prescriptions to a female companion (alleged patient) for the purposes of drug abuse.

8. A number of cases contained the situation where the cause of action was based on negligence and breach of care on the part of the particular company or individual being sued. These cases involved the signing of a number of blank reports and later, pertinent information filled in: insider fraud involving the signing of drawer signatures on numerous checks in blank without the appropriate information filled in. Documents were supposed to have been thoroughly scrutinized before signing. These cases arise against banking institutions for return of funds, and the bank raises the defense of negligence on the part of the depositor and ratification of forgery or fraudulent alteration.

9. Banking and negotiable instrument type problems—specifically: an embezzlement case where the company president authorized to sign company checks claimed it was his routine practice to sign as many as 30 to 40 checks at 1 time without interruption and without reading payee names typed on said checks by his bookkeeper. Usually such claim for recovery of funds is against the bond company who raises the defense of negligence, while the victim company raises the basis for claim was loss as a result of misrepresentation.

The above example cases are not intended to be all exclusive but merely illustrative.

As one can readily see, the question as to whether or not several signatures of the same person were signed in a continuous, uninterrupted manner (series) can become very important and often the very essence of a litigation.

Problems such as these initiated the following work in an attempt to determine:

1. Are there common characteristics shared among signatures that are signed in a continuous, uninterrupted manner, that is, a series fashion?
2. If so, what are they?
3. Can these characteristics be used as reliable parameters that forensic document examiners can utilize to resolve future similar cases?

By way of background consider the following. When one begins the writing act, there are both external and internal influences that can affect the nature of the writing itself. When making reference to that nature of the writing, one envisions the characteristics of the writing that are unique to it, such as, the beginning and terminating strokes; the speed of execution of the particular writing; the letter forms; alignment, both vertically and horizontally; the height ratios of the various letters; the crowding of the letters with respect to one another; the line quality of the writing; overall size; flourishings; and other identifying characteristics associated with the particular writing hand. All these characteristics are dynamic in the sense that they are constantly changing or vary with one another, but, in their natural state, fall within a constant range that is unique to a particular person. This is why in considering or trying to determine the genuineness of a particular signature, a document examiner will attempt to conduct an examination using as his basis for comparison a number of known signatures that are contemporaneous in time and of similar import to the questioned material to be examined. The purpose of examining a number of known signatures is to determine the range of variation that a writer may possess or is capable of. If the examiner were to pluck out one of these known signatures and use it alone to compare with the questioned signature, he would generally see in most cases a number of differences that could not be accounted for in the questioned signature that appear or do not appear in the known signature. The term "differences" in this text means "deviating from or not exactly the same." The signature, being one of the most automatic expressions of one's writing, would be expected to manifest a lesser degree of variation than would be expected for one's extended writing. This again is all dependent, of course, upon the particular writer. If one looks at variation, one would expect a greater degree of occurrence when writing has been performed under conditions where the external or internal influences or both change. And in a similar sense, one would expect variation to be of a lesser degree, when the external and internal influences upon the writer is constant or does not change from one signature to the next.

What are some of these external and internal influences that can have a bearing or effect upon one's degree of variation and, in turn, on the nature of his signature? External influences can be objects, such as the particular writing instrument itself. The size of the writing instrument can have a bearing on the way the instrument is held or positioned in one's hand, the feel of the writing instrument, the smoothness of the way the instrument glides across the paper, and whether the instrument feels awkward or comfortable. The writer's position will also have a bearing upon the degree of variation that can be seen in one's signature, that is, whether or not the writer is standing, sitting comfortably or awkwardly, or leaning over or lying down and whether the hand, wrist, arm, and elbow are in a normal writing position or not. The type of writing media that is being used can also create some problems, whether it is smooth or rough. The paper position with relationship to the writer's position is important. Is the writer cramped or does he have adequate space of freedom to execute the writing act? The physical condition of the writer: is the writer afflicted with some infirmity or physical disability? These, among other external influences, will have some bearing upon the degree of variation that occurs in one's signature.

Internal influences may be the state of one's mind. This is reflected in the degree of seriousness attached to the particular documents to be signed. Is the signature a formal or informal act? Has the writer experienced or is experiencing a traumatic or pleasurable experience. Examples of this nature are often seen in handwriting exemplars taken from individuals at the request of their accuser, or an irate individual writing a threatening, harrassing, or emotional letter or one writing a love letter or signing one's name to a check to buy something that they have always wanted. Other influences are intoxication or psychosis. Is one in a state of suicidal ideation? One's state of mind can have a great influence upon the degree of variation that would appear in that writer's overall expression.

Where does all this lead? Ostensively, if one executes one or more signatures while these external and internal influences are constant or unchanged in the writing act, one would expect a greater degree of similarity among those signatures signed all at that time, that is, continuously and uninterrupted, than one would expect when such signing acts occur when the external and internal influences are changed between each signing.

A survey of the published and unpublished literature, provided, however, few papers specifically addressing this narrow issue, and then at best, in an indirect manner. A few papers gave specific telltale signs that indicated whether signatures, marks, or writings were written at the same time or at different times. A paper by Harris and Mills dealt with medical records [1]. Keeler [2] related characteristics of connecting marks and unnatural regularity of fraudulent tally marks in an election fraud case. Hilton [3] discussed unnatural regularity of tally marks in ballot frauds. Harrison [4] related regularity seen in fraudulent diary and notebook entries. Doud [5] described details for the evaluation of natural letter form variations as opposed to unnatural uniformity in calendar and diary entries. Beck [6] also addressed natural and unnatural entry variations. Foley's research [7] into handwritten entries cited both literature and actual case results and summarized objective characteristics that may be used in determining whether or not entries into record logs or a continuous body of writing were made all at one time or over numerous, different occasions as they were held out to be. Two unpublished papers by Foley [8,9] addressed the concept of nearly identical signatures via exegetical and syntactical analysis.

These two papers articulated and summarized a concept touched upon by authors, such as Osborn [10], Hilton [11], and Baker [12]. These authors independently arrived at the conclusion that there can exist two or more genuine signatures of the same writer that are "nearly" (approximately) identical, that is, a slightly lower plateau than "sameness in all that constitutes the objective reality of a thing," and that the reason that no two signatures prepared by anyone are identical in every detail is because variation is an integral part of natural writing.

Writing variation is often stated as the use of more than one form or style of a letter or letter combinations or changes that may occur in the elements that make up handwriting, that is,

those of form such as details of design of the writing as a whole or of a particular letter, slant, proportions, retracings, loops, angles, sharpness of turns, angularity or roundness, ornamentation, legibility, and those movements including speed, uniformity, alignment, smoothness or tremor, emphasis and shading, skill, interruptions and stops, and movement at the beginning and ending of words as well as within words [13].

Hilton further describes handwriting variation and the factors influencing it:

The amount and kind of variation differs among writers and in its way forms an important element in the identification. With some it is slight and occurs only in details, with others it covers a rather wide range. Variation is due principally to the lack of machinelike precision in the human body, but it is also accentuated by external factors, such as writing position, writing instrument, and care of execution. Writing variation is also influenced by physical and mental conditions,

such as fatigue, intoxication, drug use, illness, nervousness, and stress. These several factors produce a varying degree of deterioration in the quality of writing, commensurable in its degree with the intensity of the cause [11].

As logic would have it, these factors affecting variation would seem to have a greater degree and diversity of effects or influences on signatures that were signed at different times and occasions, that is, not continuous, sequential, or uninterrupted, as opposed to signatures that were not signed under such conditions. Indeed, a recent research and literature survey on handwritten entries in logs and diaries supports this proposition [7]. It was observed that single entries written over different times or occasions exhibited greater changes in handwriting variation as opposed to the multiple handwritten entries written during a single setting. In fact, this difference in increased handwriting variation was often a telltale sign used to distinguish the two types of entries.

Variation comes from the inability to reproduce exactly any given neuromuscular act. Normally, one finds only slight amounts of variation in the writing of a skilled author, and greater variations in the writing of an unskilled author. However, the skilled writer by virtue of his skill is also capable of willfully introducing more changes in his writing style than the unskilled.<sup>2</sup>

A formal detailed discussion of causes of variation would include such factors as: the impossibility of the human hand reproducing all the qualities and elements found in one pencilled line drawn across a piece of blank paper; the position of the writer; the writing instrument used; the space available; the purpose of the writing; the writing surface; and the physical, mental, and emotional condition of the writer. However, since the prerequisite for knowing what is unusual is to know what is usual, we should observe that the process of writing is so fixed that in most instances even those writings executed under the most unusual of circumstances show little variation.<sup>2</sup>

A number of works have dealt with approximating the date of a writing, or the time frame in which a writing was executed by determining and comparing the particular identifying features of the questioned signature with numerous exemplars covering many years which date before, during, and after the questioned writing. The known writing is examined in chronological order to determine the changing characteristics of the writing. The changing characteristics might be modified letter designs, such as including new or omitting old letter designs, mixing of cursive writing with printing, the addition of flourishes and extraneous marks, and the use and frequency of use of alternate letter designs. Once a determination is made of what characteristics of the questioned writing are consistent with a period of time, based upon the standards, an approximate date of execution is possible [14].

Source materials used in this research consisted of more than 400 known exemplars of signatures of various persons signing groups or series of signatures where the circumstances and the very nature of the documents themselves dictated that the signatures appearing on said documents were signed in a continuous, uninterrupted, and generally sequential manner. Many of these documents were collected exemplars signed in the routine course of business, such as testaments in statutory form; payroll checks signed in a sequential manner where it was verified that 20 to 30 of the checks were all signed at the same time, 1 right after the other; and stock certificates where the issuer signed 50 stock certificates at 1 time.

A number of these exemplars were request exemplars, where the signers were specifically instructed to sign their names between three to ten times, one signature per page, on lined pages stapled together simulating the signing of a multipage will. These same writers were asked to sign drawer signatures on ten blank checks. Also, they were asked to sign a single sheet of paper five times.

<sup>2</sup>J. F. McCarthy, "Unusual Variations in Handwriting of One Writer," unpublished paper.

These collected multisignature exemplars were compared with signatures from the same individuals signed about the same time where it was either known or reliably presumed that the said signatures were signed in a single, interrupted manner. Sex, age, educational, or professional backgrounds were not considered to be pertinent to this research.

There are obviously numerous forms and formats in which a group or series of signatures signed by the same person in a continuous uninterrupted manner can occur. Most of the multiple signatures examined in this work consisted of testaments, stock certificates, and checks.

Two basic types of signatures were examined.

1. Single signatures executed on documents and under conditions that would only require one signature to be signed at one time and no more. After each signature was signed there was a complete interruption in the signer's writing position and probably a change in the external and internal influences upon him.

2. Multiple series signatures executed on documents or under conditions that would require a number of signatures to be signed by the same person all at one time in a continuous, uninterrupted, and generally sequential manner. Under these circumstances, the signer does not completely alter his hand, wrist, arm, or writing position between each individual signature of the series, but maintains the same general writing position without interruption until the entire series of signatures has been signed.

### **Common Characteristics Observed**

#### *Alignment and Size*

With single signatures, because of the realignment of the writing position, it follows that the body, arm, wrist, elbow, and hand had to be repositioned each time a document was signed. Consequently, when comparing a number of single signatures with one another, there was no noticeable correlation between the single signatures such as regularity or consistency in alignment either horizontally or vertically or size that could be observed. This observation does consider the fact that some individuals will habitually sign their name with a characteristic right, center, left or ascending, straight or descending alignment. The distinction drawn here is that in such habitual malalignments, there exists a greater degree of variance and less regularity in said alignments and size than one observes in series signatures.

Basically, three methods of signing multiple or series signatures in a continuous, uninterrupted manner were observed.

One such method consisted of documents, such as disclosure statements, insurance forms, and affidavits where more than one signature had to be placed on the single document. These documents generally required a name to be signed at the top, middle, and bottom portions of the document. In this signing procedure, the body position of the writer basically remains unchanged; however, there is generally a repositioning of the arm, hand, wrist, and elbow as one signs the multisignatures on the single-page document. This requires the arm, hand, wrist, and elbow to move down the page while signing. Although the internal influences on the writer remain basically unchanged, there is a slight change in external conditions. This change in arm, hand, wrist, and elbow position can insert a greater degree of variance between the series signatures and therefore, can lessen the regularity and consistency observed in alignment and size of said signatures.

The greatest consistency and regularity in alignment and size was observed with series signatures signed using the stacked method of signing. In this method of signing, documents were stacked one on top of the other. In this method of signing, documents were stacked one on top of the other. Here each document as it appeared on the top of the stack was signed and then subsequently moved to the side to obtain access to the next document below it. In this method of signing, both external and internal influences on the writer basically re-

mained unchanged from one signature to the next in the series. About the only change that occurs in this method of signing is a change in the wrist position. This occurs when signed documents are being removed and set aside.

The third method consisted of a combination of the stack signing and single-page multiple signatures method, that is, a multipage document that had to be signed a number of times on each page. The observations as to alignment and size of the series of signatures were indistinguishable from the results obtained with the multisignature single-page method described above. This was expected since there is generally a repositioning of the arm, hand, wrist, and elbow after each signature was signed.

### *Signature Form and Quality*

The single document containing a single signature exhibited a slightly slower, and sometimes a more legible execution than was observed in the group or series signatures. However, this was not always observable. There were certain extremes of speed, decrease in legibility, and increase in carelessness observed in a group or series signatures that was not evident in the single signatures.

After the signing of the first signature of a group or series signature, the writing position, alignment, orientation, environmental conditions, external and internal influences, and familiarization have all been basically established. When numerous subsequent documents are signed in succession, generally speed of execution increases. Increased speed was often exemplified by increased slant, deteriorating letter construction, feathering of beginning and terminating strokes, decreased pressure, flatter and longer lengths, and decrease in legibility. There was an observation of increased variation when comparing group or series signatures with single signatures.

This was not unexpected with the general increase in speed associated with group or series signatures. It was noted, however, that the amount of variation between group or series signatures was, as a rule, less than that noted when comparing group or series signatures with single signatures. This was consistent with the circumstances under which group or series signatures are signed.

### *Letter Forms*

Doud [5] observed several cases in which letter form variations had some relevancy in determining whether or not entries were written at or about the same time rather than on separate dates. These variations were related statistically as to the frequency of occurrence in standard writings as compared to the frequency of occurrence in questioned entries. This variation is based on the premise that one or the other letter form would be more consistently used (a higher probability of occurrence) in a set of multientries than in single entries.

Doud [5] found that in one case dealing with time card entries a triangular figure 4 was used in 98% of the questioned entries whereas it occurred in only 40% of the entries in the standard time card.

Foley [7] also observed a greater occurrence of optional form usage in multiple entries versus single entries. It appears that these observations are also applicable to single signature and group or series signature problems. In the single signatures that were examined, the option or alternate letter usage was sporadic, whereas, in group or series signatures, the option or alternate letter form was either used in the entire group or series or not at all. This was not unexpected since the group or series signatures are all signed at the same time when the internal influences or state of mind of the signer generally remains unchanged throughout the series.

Experienced examiners will quickly realize that one of the most classical examples where the aforementioned common characteristics can be observed are in collecting signature ex-

emplars. Such instances occur most frequently in criminal investigations, although they are by no means confined exclusively to these type cases. In request or dictated exemplars, the suspect is requested to sign a number of signatures in a continuous manner one right after another. This type of exemplar often manifests a lesser degree of natural variation than would occur between signatures that one would observe with collected exemplars where the signatures were signed at different times. This, in fact, is the reason why request or dictated exemplars written in a synchronous sequential fashion are discouraged and are less desirable for examination or comparison purposes than request or dictated exemplars signed in a manner where the writer has to change writing position or collected type exemplars.

### *Simulated or Traced Forgeries*

CAVEAT! The possibility exists that a group or series of continuous and uninterrupted signed signatures could be mistaken as traced or simulated forgeries.

Great consistency in letter forms, baseline alignment, beginning and terminating strokes, penlifts, speed of execution, decrease in variation among a group or series of signatures, along with other characteristics are deemed to be the classical trademarks of traced or simulated forgeries. Thus, it becomes most imperative that an examiner does not misconstrue the importance or significance of being able to interpret or evaluate properly the different types and degrees of signature variation.

### **Conclusion**

In conclusion, it is feasible for an examiner, based on the principles mentioned, along with other relevant document evidence, to differentiate between a group or series of signatures or initials that were signed or written all at the same time and signatures signed at different times. The signatures done at the same time have greater regularity and consistency because the external and internal influences on handwriting variation are minimal as opposed to the signatures signed at different times where the influences on handwriting variation are greater, more pronounced, and diverse, manifesting in a lesser degree of regularity and consistency among the signatures.

### **References**

- [1] Harris, J. J. and Mills, D. H., "Medical Records and the Questioned Document Examiner," *Journal of Forensic Sciences*, Vol. 8, No. 3, July 1963, pp. 453-461.
- [2] Keeler, K., "A Study of Documentary Evidence in Election Frauds," *Journal of Criminal Law, Criminology and Police Science*, Vol. 25, No. 3, 1934-35, pp. 324-337.
- [3] Hilton, O., *Scientific Examination of Questioned Documents*, Callaghan and Co., Chicago, 1956, p. 134.
- [4] Harrison, W. R., *Suspect Documents: Their Scientific Examination*, Sweet and Maxwell Ltd., London, 1966, pp. 60-61, 208.
- [5] Doud, D. B., "Letter Form Variations as Related to Suspect Calendar and Diary Entries," report presented at a meeting of the American Society of Questioned Document Examiners, San Francisco, CA, 1976.
- [6] Beck, J., "Evaluation of Handwritten Diary Entries," report presented at a meeting of the American Society of Questioned Document Examiners, Milwaukee, WI, 1974.
- [7] Foley, B. G., "Handwritten Entry Research," *Journal of Forensic Sciences*, Vol. 24, No. 2, April 1979, pp. 503-510.
- [8] Foley, R. G., "Nearly Identical Signatures," report presented at a meeting of the American Society of Questioned Document Examiners, Boston, MA, 1982.
- [9] Foley, R. G., "Nearly Identical Signatures A Supplemental Exposition," report presented at a meeting of the American Society of Questioned Document Examiners, Montreal, Canada, 1985.
- [10] Osborn, A. S., *Questioned Documents*, 2nd ed., Boyd Printing Co., New York, 1929, p. 556.
- [11] Hilton, O., *Scientific Examination of Questioned Documents*, Elsevier North Holland, Inc., New York, 1982, p. 159.



- [12] Baker, *Law of Disputed and Forged Documents*, pp. 45-46.
- [13] Hilton, O., "How Individual Are Personal Writing Habits?," *Journal of Forensic Sciences*, Vol. 28, No. 3, July 1983, pp. 683-685.
- [14] Davidson, J. M., "How Changing Individual Characteristics May Indicate Age of a Writing," paper presented at the meeting of the American Society of Questioned Document Examiners, Vancouver, B.C., Aug. 1980.

Address requests for reprints or additional information to  
Robert G. Foley  
Forensic Document Examiner  
105 Regency Place, Suite D  
West Monroe, LA 71291