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## *Editorial*

Once again, I am publishing research papers written by my students who have taken my course, the Forensic Document Examination International Training Program that I wrote originally in 1994. I require all of my students to conduct research projects as part of the training. To date, we have benefited from the research that has been conducted. And, it is important to publish these research papers to give us additional information about the field of document examination. In fact, the field of document examination has been criticized for not published enough research papers.

In this issue we have two research papers. The first paper by Lydia Moschou covers Disguised Writing and how effectively a person can disguise his or her handwriting and signature. She presented 20 samples by various people who attempted to disguise their writing.

The second research paper talks about Forgeries of Sports Memorabilia that are a major issue for sports memorabilia collectors. That could be over 50% and because the forgers are experts at forging, they are difficult to detect as you will see in examples in the article.

I presented a paper at the Annual Seminar regarding the number of exemplars needed for various types of cases. I am including an article on the subject as it is important to know that all cases do not require 20 to 25 signatures. This information can be very useful in court. Since I intend to include various types of case studies, this article includes some of the cases that I have done. I am hoping that some of you will submit case studies to me for our future articles.

Keep in mind that it is advantages to be published. The first question I am asked by other experts is, "Are you published?" I once had an attorney tell me that he wants to hire the expert who is published. If you have difficulty writing, collaborate with another document examiner. I am always available to help anyone who needs help in preparing an article. I am also available to proof-read your articles as many people assisted me by reviewing my books and making recommendations for changes.

One issue that occurs frequently concerns the definition of handwriting identification as an art, a skill or a science. As there may be some skill involved but based upon the body of knowledge and the rules to be followed when making an examination, I believe that document examination is a science although many people consider it a skill. It is a skill and a very difficult skill as opposed to other areas of forensic science. It is the only field where an exact match is indicative of a copying process. We must be able to distinguish the difference between disguise and simulation. A judge once asked me if there such a thing as a perfect forgery to which I responded, "I could not identify a perfect forgery." I myself was able to create a copy of my daughter's signature that is undesignable from her own signature so the answer is, "Yes, there is such a thing as a perfect forgery."

*Kathie Koppenhaver*

*Athens July 2022*

### General overview

The present research is focused on disguised writing and tries to give answer on the subject whether a writer could proceed with the modification of his own handwriting in a way that could be not recognized.

Disguised writing is any deliberate attempt to alter one's handwriting to prevent recognition. In other words, the purpose of the disguised writing is the production of a signature or a writing which will not be similar with the normal<sup>1</sup> writing/signature.

Writers believe that changing the general appearance of their writing is an effective disguise. However, the small and delicate changes are not contributed to a significant change into the normal writing/signature; in contrast, those changes create a style of writing/signature with no consistency. It has been observed that few people can successfully change their handwriting in a way that it cannot be identified.

Scientifically, and in particular by Klages<sup>2</sup>, it has been established that the diagnosis of writing alteration by a document examiner is generally possible. Klages said that the disguised writing is subject to three psychological laws:

- a) The law of the attention's direction ("*Gesetz der Aufmerksamkeitsrichtung*"): Pursuant to this, the writing characteristics being possible altered are those that are under writer's perception. Therefore, the writer trying to alter his writing leaves unaltered the writing characteristics that are not subject to his perception;
- b) The law of the difficult "production" of the writing characteristics ("*Gesetz der Herstellungsschwierigkeit von Schrifteigenschaften*"): According to this, the less a writing element belongs to the writer's capacity, the greater it's difficulty be "produced".
- c) The law of the consequential changes ("*Gesetz der Begleitveränderungen*"): By virtue of this, each intentional writing modification is followed by accidental side-effects.

### Purpose of the research

Despite the fact that, according to the bibliography, it has already been concluded that the disguised writing can be easily recognized, my intention through the present research is to prove that one's profession and capabilities might lead into a successful disguised writing.

Therefore, I asked 20 people to proceed with the following actions:

1. To copy a text<sup>3</sup> consisting of 12 lines with two different ways; (a) spontaneously and (b) attempting to alter their one handwriting in order to prevent its recognition; and

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<sup>1</sup> By normal writing, it is defined the writing in which any writer has become most practiced and in which he has had the greatest opportunity to become fluent.

<sup>2</sup> L. Klages: *Handschrift und Charakter*, Bonn 1956, p.g. 184

<sup>3</sup> The text is a Greek poem which includes difficult words.

**Intentional Writing Modification**  
**Research project by Lydia Moschou**

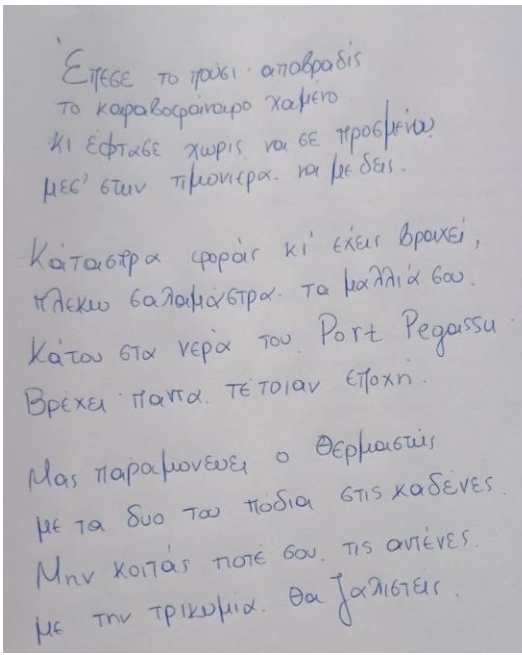
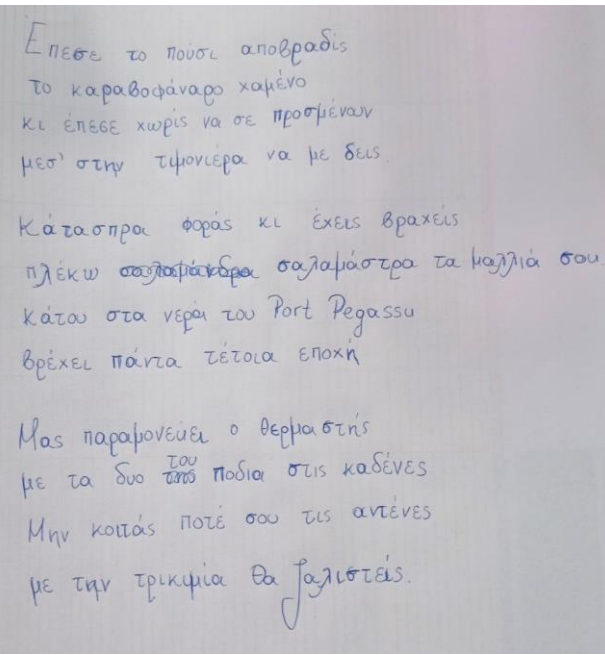

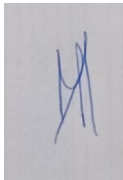
2. The same rational was followed with the signatures: To provide me with two signatures; their own/normal signature and one that could not be identified.

## II. Samples<sup>4</sup>

### Sample 1

Writer's profession: Economist

Table 1:

Normal writing	Disguised writing
	
Normal signature	Disguised signature
	
<p><u>Significant similarities (red symbols) and methods of disguised writing:</u>  <u>Text</u></p> <ul style="list-style-type: none"> <li>Utilization of space similar</li> <li>Similar pressure patterns</li> <li>Similar spacing</li> <li>Similar margins</li> <li>Moderate rhythm</li> <li>No unnatural pen lifts or blobs of ink</li> </ul>	<p><u>Significant differences</u></p> <p>The disguised signature shows differences compared to the normal one, please find below the most important differences:</p> <ul style="list-style-type: none"> <li>In style: the normal signature is more cursive and has more embellishments</li> <li>In length: the disguised signature has a narrower line; the latter is a consequential change due to the fact that the writer was more careful modifying its signature.</li> </ul>

<sup>4</sup> All the samples are photographs from the originals.

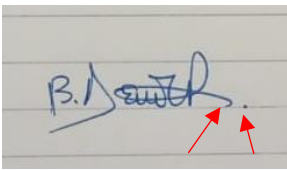
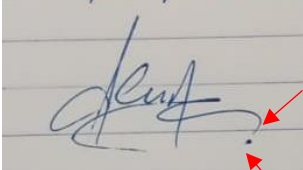
# Intentional Writing Modification

## Research project by Lydia Moschou

### Sample 2

Writer's profession: Economist

Table 2:

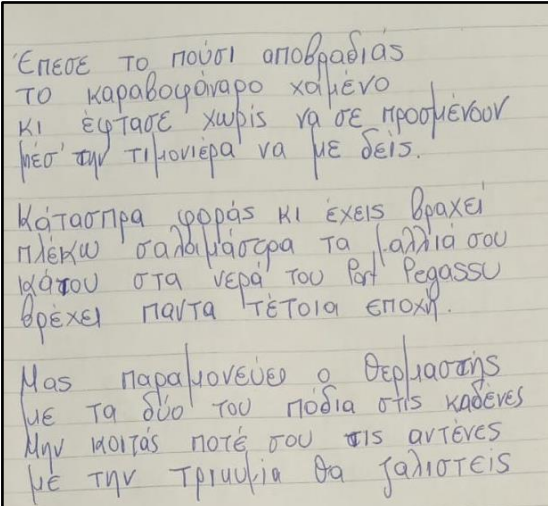
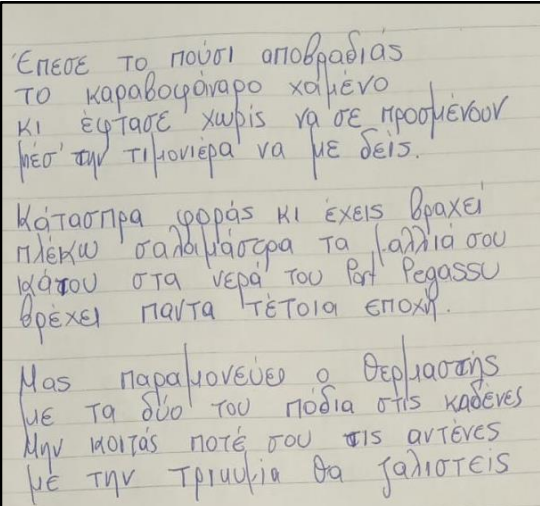
<p>Έπεσε το πούκι αποβραδὶς το παραβοράνο χαμένο κι ἔπεσε χωρὶς να σε προσμένουν μεσ' τὴν τιμονιέρα να με δεις.</p> <p>Κάτασπα φορὰ κι ἔχεις βραχὶ, πλέκω σαλαμάστρα τὰ μαλλιά σου κάτου στα νερὰ του Port Pegassou βρέχει πάντα τέτοια εποχή.</p> <p>Μας παραμονεύει ὁ θερμαστὴς με τὰ δύο τὴς πόδια σὺς καδύνες. Μὴν κοιτᾷς ποζέ σου τὴς ανένες με τὴν τρικυμία θα γαλιόζει.</p>	<p>Έπεσε το πούκι αποβραδὶς το παραβοράνο χαμένο κι ἔπεσε χωρὶς να σε προσμένουν μεσ' τὴν τιμονιέρα να με δεις.</p> <p>Κάτασπα φορὰ κι ἔχεις βραχὶ, πλέκω σαλαμάστρα τὰ μαλλιά σου κάτου στα νερὰ του Port Pegassou βρέχει πάντα τέτοια εποχή.</p> <p>Μας παραμονεύει ὁ θερμαστὴς με τὰ δύο τὴς πόδια σὺς καδύνες. Μὴν κοιτᾷς ποζέ σου τὴς ανένες με τὴν τρικυμία θα γαλιόζει.</p>
Normal signature	Disguised signature
	
<p><u>Significant similarities (red symbols) and methods of disguised writing:</u></p> <p><u>Text</u></p> <ul style="list-style-type: none"> <li>Utilization of space similar</li> <li>Similar pressure patterns</li> <li>Similar spacing</li> <li>Similar margins</li> <li>Moderate rhythm</li> <li>No unnatural pen lifts or blobs of ink</li> </ul> <p><u>*Signature</u></p> <ul style="list-style-type: none"> <li>A dot at the end of the signature</li> <li>The same terminating tail</li> </ul>	<p><u>Significant differences</u></p> <p>In the disguised writing the slant is on the right whereas in the normal there is a lack of slant. Based on the third psychological law of disguised writing (as described above within the Introduction), the said writing modification (right slant) of the disguised writing might have produced a consequential change seen by connected (cursive) strokes within some words (please refer-indicatively-to the green circles).</p>
<p><u>Observations:</u></p> <p>Unique characteristic: The lower case “ε” and the way is connected with lower case “ζ” (please refer to blue circles).</p> <p><u>Observations:</u></p> <p>In the disguised writing, the writer patched lower case “σ” in order to differentiate it from the one used in the normal writing (please refer to blue circles).</p> <p>Unique characteristic: The writer forgets to put tones<sup>5</sup> on the letters in both the normal and the disguised writing.</p>	

<sup>5</sup> Definition: Monotonic orthography (from Ancient Greek (“monos”=single) and (“tonos”=accent) is the standard system for Modern Greek.

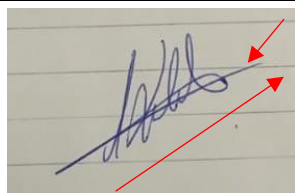
**Sample 3**

**Writer's profession:** Economist

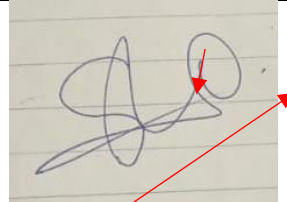
**Table 3:**

	
-----------------------------------------------------------------------------------	------------------------------------------------------------------------------------

**Normal signature**



**Disguised signature**



**Significant similarities (red symbols) and methods of disguised writing:**

**Text**

- Utilization of space similar
- Similar pressure patterns
- Similar spacing
- Similar margins
- Moderate rhythm
- No unnatural pen lifts or blobs of ink

**Signature**

- The same slant: It starts from bottom to top
- Terminating tail in disguised signature is similarly placed piercing through the signature in the same location

**Significant differences**

**Observations:**

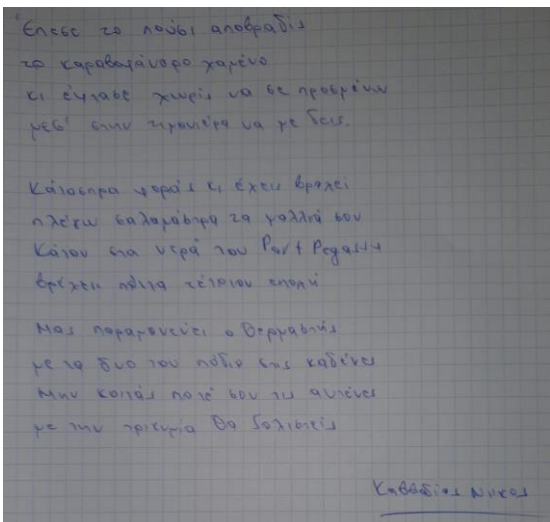
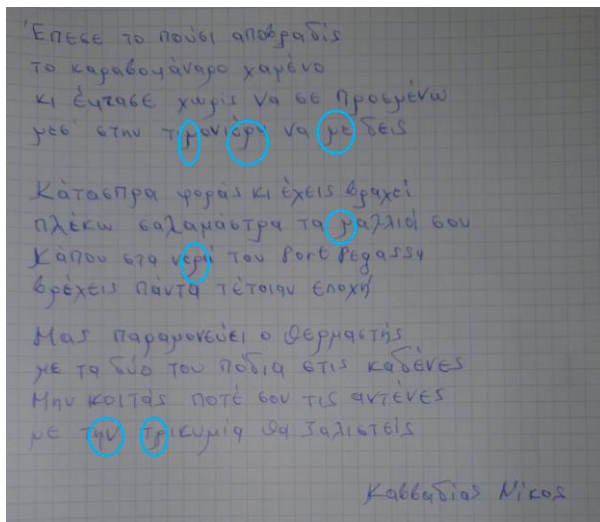
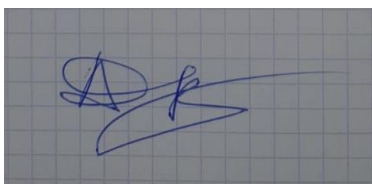
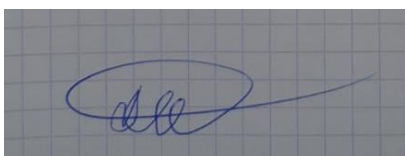
In the disguised writing, the writer patched lower case "t" in order to differentiate it from the one used in the normal writing (please refer to blue circles).



**Sample 4**

**Writer's profession:** Lawyer

**Table 4**

Normal writing	Disguised writing
	
Normal signature	Disguised signature
	

**Significant similarities (red symbols) and methods of disguised writing:**

**Text**

- Utilization of space similar
- Similar pressure patterns
- Similar spacing
- Similar margins
- Moderate rhythm
- No unnatural pen lifts or blobs of ink

**Significant differences**

The disguised signature shows differences compared to the normal one, please find below the most important differences:

- In the slant of terminating strokes: the terminating stroke in the normal signature has a slant from the bottom to top whereas in the disguised the slant of the terminating stroke is exactly the opposite
- In pictorial appearance

**Observations:**

In the disguised writing, the writer has some unusual letterforms by extending the letters strokes (please refer to blue circles). It seems that the said extension is not natural since the writer, especially in the last sentence of the text, forgets it and adds it separately/additionally.

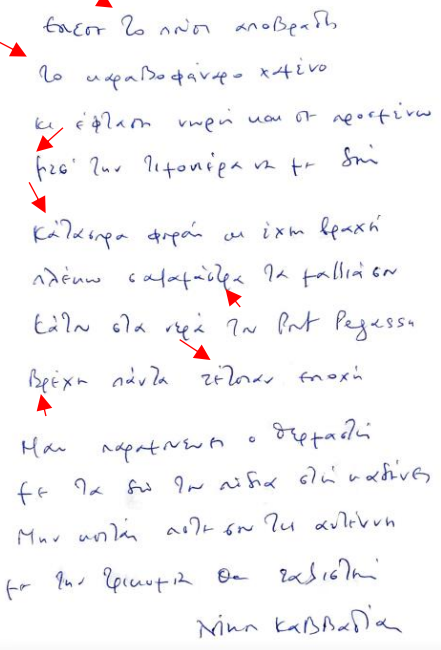
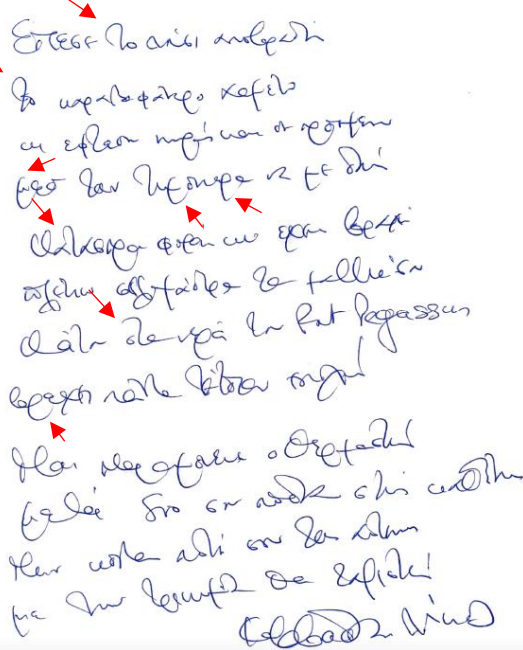
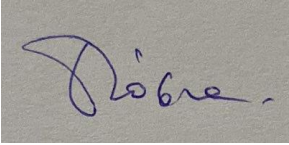
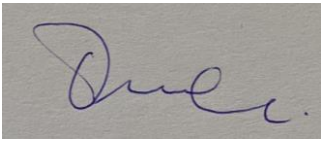


**Intentional Writing Modification**  
**Research project by Lydia Moschou**

**Sample 5**

**Writer's profession:** Document examiner

**Table 5**

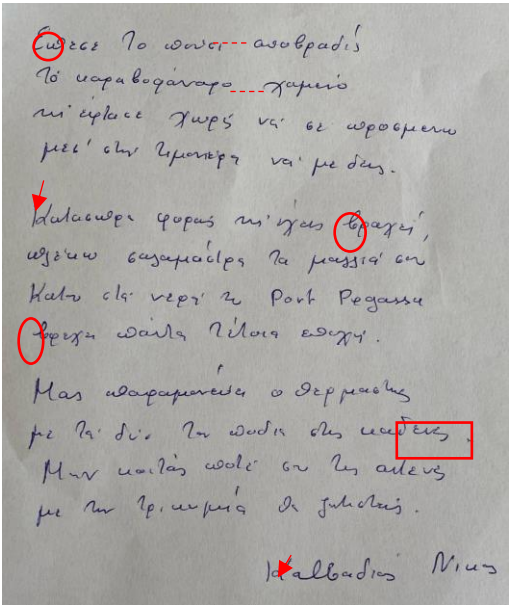
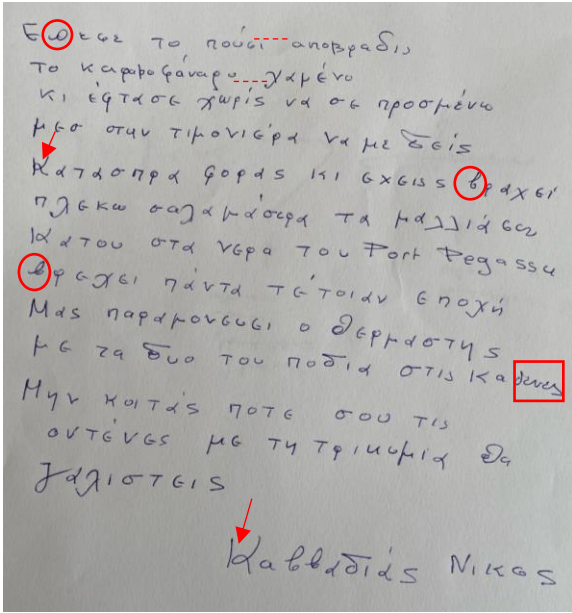
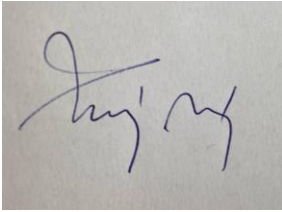
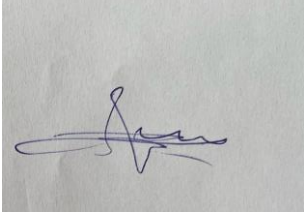
Normal writing	Disguised writing
	
Normal signature	Disguised signature
	
<p><u>Significant similarities (red symbols) and methods of disguised writing:</u></p> <p><u>Text</u></p> <ul style="list-style-type: none"> <li>• Similar pressure patterns</li> <li>• Moderate rhythm</li> <li>• No unnatural pen lifts or blobs of ink</li> <li>• More natural writing</li> <li>• Different size</li> <li>• Letter formation: with red symbols have been spotted all the letters with unique characteristics, i.e. the lower case "r" is always taller than the other letters of the word and has a hook on the left, the first stem of lower case "μ" has a hook on top and the ending of lower case "p" creates a hook on the bottom</li> </ul> <p><u>Signature</u></p> <p>A similar initial movement is observed in the first three changes of pen direction within both normal and disguised signatures (indicating habitual movement). Followed by an arcading terminal tail with an upturned taper.</p>	
<p><u>Significant differences</u></p> <p>The writer utilizes a leftward slant and a more stylized and loopy writing in the disguised written text and signature.</p>	
<p><u>Observations:</u> A unique characteristic is that the writer forgets to put tones<sup>7</sup> on the letters in both the normal and the disguised writing.</p>	

<sup>7</sup>Definition: Monotonic orthography (from Ancient Greek ("monos"=single) and ("tonos"=accent) is the standard system for Modern Greek

**Sample 6**

**Writer's profession:** Document examiner

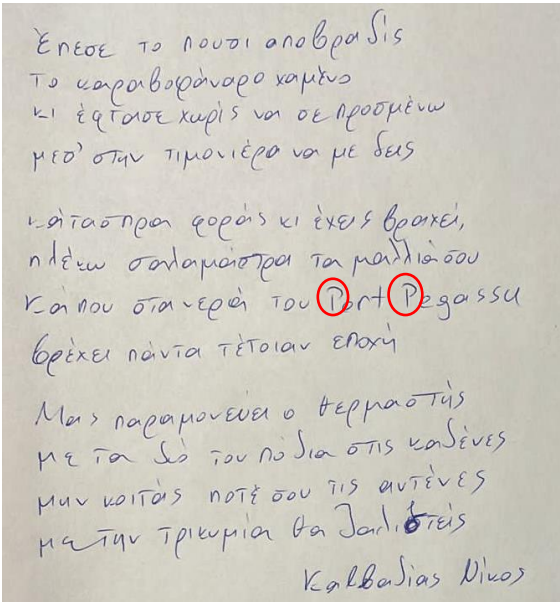
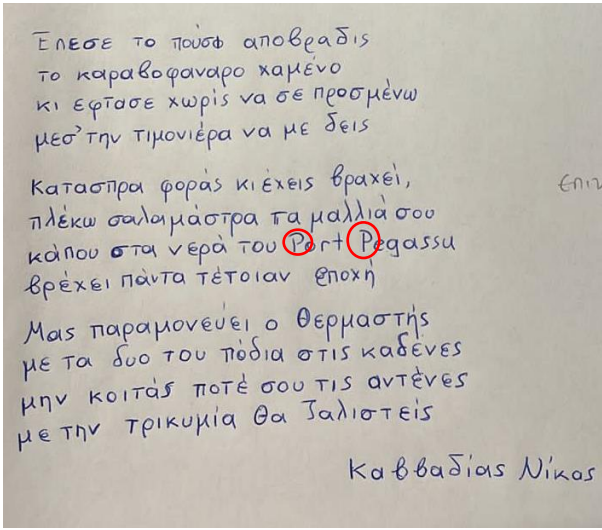
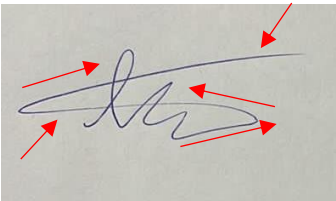
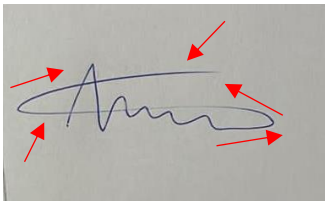
**Table 6**

Normal writing	Disguised writing
	
Normal signature	Disguised signature
	
<p><u>Significant similarities (red symbols) and methods of disguised writing:</u></p> <p><u>Text</u></p> <ul style="list-style-type: none"> <li>Utilization of space similar</li> <li>Similar pressure patterns</li> <li>Moderate rhythm</li> <li>No unnatural pen lifts or blobs of ink</li> <li>More natural writing</li> <li>Letter formation: with red symbols have been spotted all the letters with unique characteristics, i.e. the lower case "π" has 2 loops and a hook on the left, the capital "K" has a small loop in the middle and the word "καθένας" has exactly the same ending</li> </ul>	<p><u>Significant differences</u></p> <p>The disguised signature shows differences compared to the normal one, please find below the most important differences:</p> <ul style="list-style-type: none"> <li>In pictorial appearance</li> <li>In commencement</li> <li>In connections</li> <li>In fluency</li> <li>In the formation: the disguised signature has a grotesque formation</li> </ul>
<p><u>Observations:</u></p> <p>Inconsistencies: In the disguised writing the lower case "π" at the beginning of the text (and only there) is calligraphic like in the normal writing. It seems that the writer, in order to differentiate it from the one used in the normal writing, changed it in the body of the text but forgot to do it at the beginning of the text (no consistency).</p>	

## Sample 7

Writer's profession: IT Engineer

**Table 7**

Normal writing	Disguised writing
	
Normal signature	Disguised signature
	

Significant similarities (red symbols) and methods of disguised writing:

Text

- Utilization of space similar
- No unnatural pen lifts or blobs of ink

Signature

- The same slant
- The same ending
- The same loops

Significant differences

The disguised writing shows differences compared to the normal writing with regard to the speed (slower in the disguised writing), the pen-grip (tighter in the disguised writing) and the pressure (heavier in the disguised writing).

Observations:

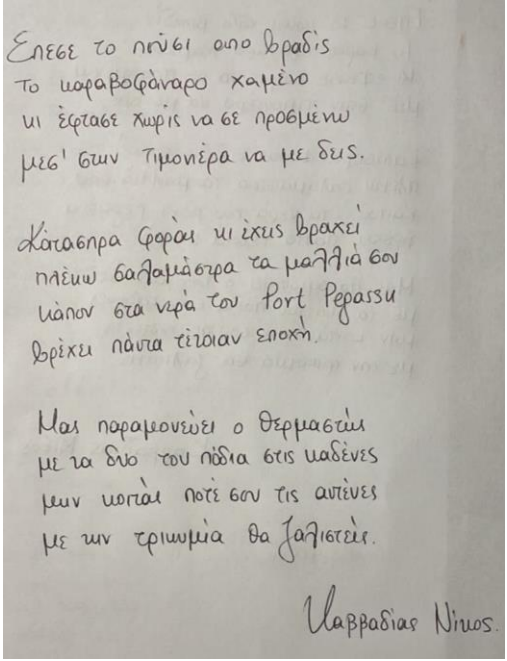
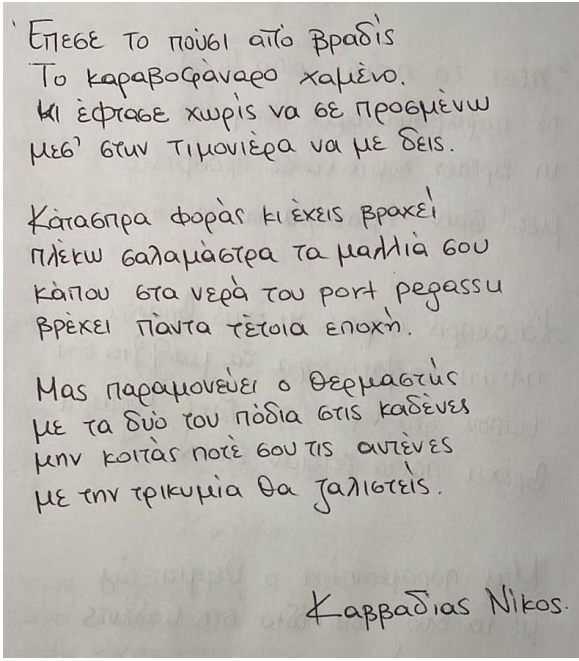
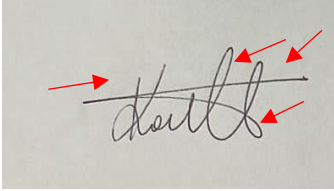
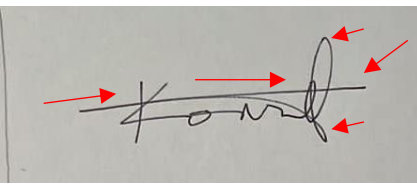
At first sight, the letter formation between the disguised and the normal writing shows differences however from a deep/close observation the formation is similar; the writer in the disguised writing was more careful.

Moreover, the difference regarding the pressure, as mentioned above, could be characterised as a consequential change of the writing modification, pursuant to the third psychological law of disguised writing (as described above within the Introduction).

**Sample 8**

**Writer's profession:** Brand Manager (Marketing)

**Table 8**

Normal writing	Disguised writing
	
Normal signature	Disguised signature
	

**Significant similarities (red symbols) and methods of disguised writing:**

**Text**

- Utilization of space similar
- No unnatural pen lifts or blobs of ink
- More natural writing
- Moderate speed
- Similar pressure pattern
- Similar margins

**Signature**

- The same slant
- The same ending
- The same loops

**Significant differences**

**Observations:**

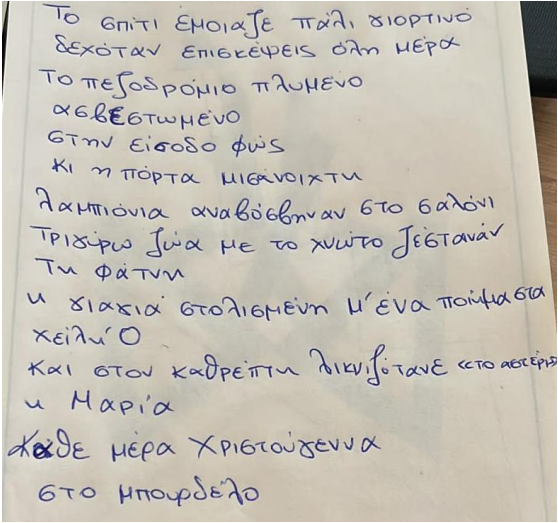
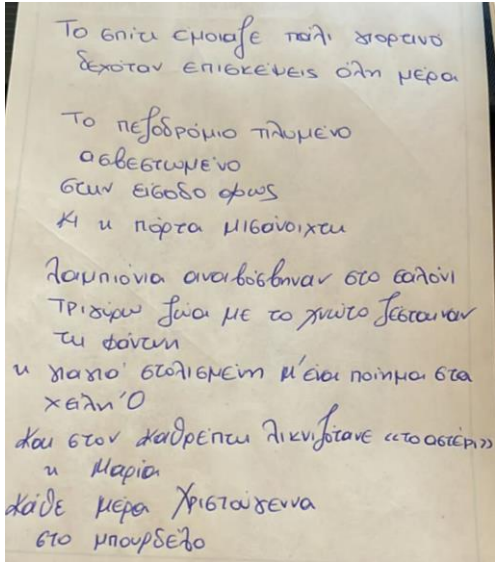
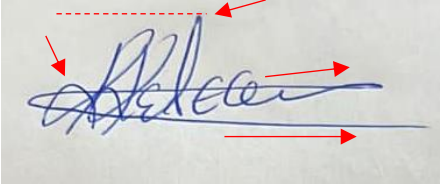
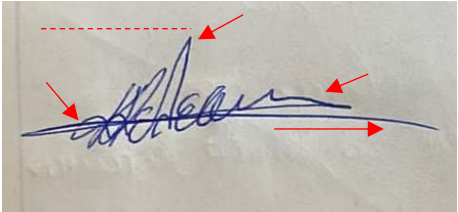
Between the disguised and the normal writing, the letter formation obviously shows similarities.



**Sample 9**

Writer's profession: Ship Engineer

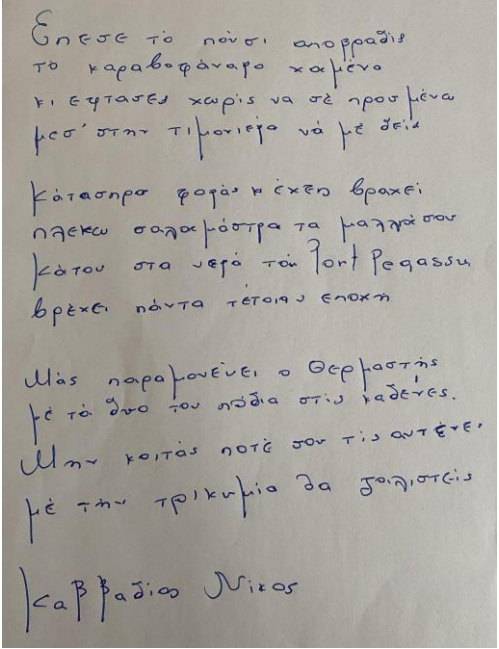
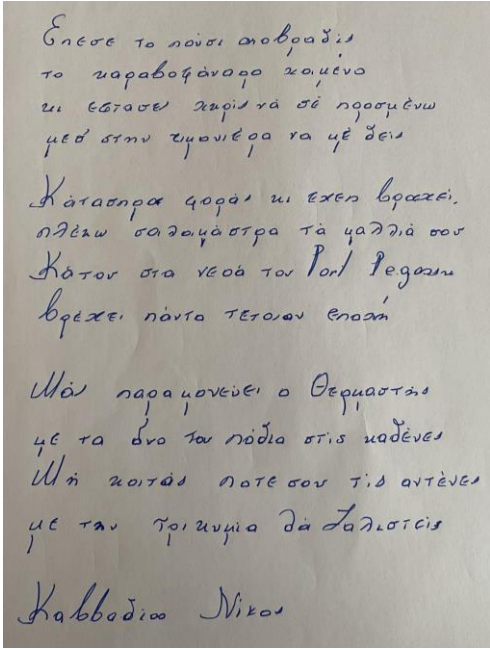
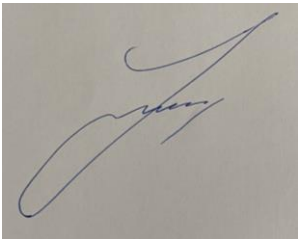
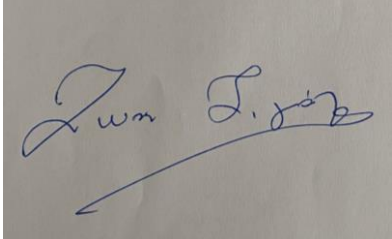
Table 9

Normal writing	Disguised writing
 <p>ΤΟ ΘΠΤΙ ΕΘΟΙΑΪΕ ΠΑΛΙ ΣΙΟΡΤΙΝΟ  ΔΕΧΟΤΑΝ ΕΠΙΣΚΕΨΕΙΣ ΟΛΗ ΜΕΡΑ  ΤΟ ΠΕΨΟΔΡΟΜΙΟ ΠΛΥΜΕΝΟ  ΑΒΕΒΕΤΩΜΕΝΟ  ΕΤΗΝ ΕΙΣΟΔΟ ΦΩΣ  ΚΙ Η ΠΟΡΤΑ ΜΙΣΑΝΟΙΧΤΗ  ΛΑΜΠΙΟΝΙΑ ΑΝΑΒΕΒΗΝΑΝ ΕΤΟ ΒΑΛΟΝΙ  ΤΡΙΣΨΩ ΓΩΑΙ ΜΕ ΤΟ ΧΥΤΟ ΓΕΒΑΝΑΝ  ΤΗ ΦΑΤΗΝ  Η ΣΙΑΣΙΟ' ΕΤΟΛΙΘΕΜΗΝ Μ'ΕΝΑ ΠΟΙΗΜΑ ΒΑ  ΧΕΛΗ'Ο  ΚΑΙ ΕΤΟΝ ΚΑΘΡΕΨΤΗ ΛΙΚΝΙΣΤΑΝΕ «ΤΟ ΑΣΤΕΡ»  Η ΜΑΡΙΑ  ΚΑΘΕ ΜΕΡΑ ΧΡΙΣΤΟΥΓΕΝΝΑ  ΕΤΟ ΜΠΟΥΡΔΕΛΟ</p>	 <p>ΤΟ ΘΠΤΙ ΕΘΟΙΑΪΕ ΠΑΛΙ ΣΙΟΡΤΙΝΟ  ΔΕΧΟΤΑΝ ΕΠΙΣΚΕΨΕΙΣ ΟΛΗ ΜΕΡΑ  ΤΟ ΠΕΨΟΔΡΟΜΙΟ ΠΛΥΜΕΝΟ  ΑΒΕΒΕΤΩΜΕΝΟ  ΕΤΗΝ ΕΙΣΟΔΟ ΦΩΣ  ΚΙ Η ΠΟΡΤΑ ΜΙΣΑΝΟΙΧΤΗ  ΛΑΜΠΙΟΝΙΑ ΑΝΑΒΕΒΗΝΑΝ ΕΤΟ ΒΑΛΟΝΙ  ΤΡΙΣΨΩ ΓΩΑΙ ΜΕ ΤΟ ΧΥΤΟ ΓΕΒΑΝΑΝ  ΤΗ ΦΑΤΗΝ  Η ΣΙΑΣΙΟ' ΕΤΟΛΙΘΕΜΗΝ Μ'ΕΝΑ ΠΟΙΗΜΑ ΒΑ  ΧΕΛΗ'Ο  ΚΑΙ ΕΤΟΝ ΚΑΘΡΕΨΤΗ ΛΙΚΝΙΣΤΑΝΕ «ΤΟ ΑΣΤΕΡ»  Η ΜΑΡΙΑ  ΚΑΘΕ ΜΕΡΑ ΧΡΙΣΤΟΥΓΕΝΝΑ  ΕΤΟ ΜΠΟΥΡΔΕΛΟ</p>
Normal signature	Disguised signature
	
<p><u>Significant similarities (red symbols) and methods of disguised writing:</u></p> <p><u>Text</u></p> <ul style="list-style-type: none"> <li>• Utilization of space similar</li> <li>• No unnatural pen lifts or blobs of ink</li> <li>• More natural writing</li> <li>• Moderate speed</li> <li>• Similar pressure pattern</li> <li>• Similar margins</li> </ul> <p><u>Signature</u></p> <ul style="list-style-type: none"> <li>• The same slant</li> <li>• The same ending</li> <li>• The same loops</li> <li>• The height (the lower case "λ" is the highest)</li> </ul>	<p><u>Significant differences</u></p>
<p><u>Observations:</u>  Between the disguised and the normal writing, the letter formation obviously shows similarities.</p>	

### Sample 10

Writer's profession: Economist (Public officer)

Table 10

Normal writing	Disguised writing
	
Normal signature	Disguised signature
	

Significant similarities (red symbols) and methods of disguised writing:

Text

- Utilization of space similar
- No unnatural pen lifts or blobs of ink
- More natural writing
- Moderate speed
- Similar pressure pattern
- Similar margins
- Same proportions

Significant differences

The writer in the normal signature signs with initials whereas in the disguised signs with the whole name/surname.

Observations:

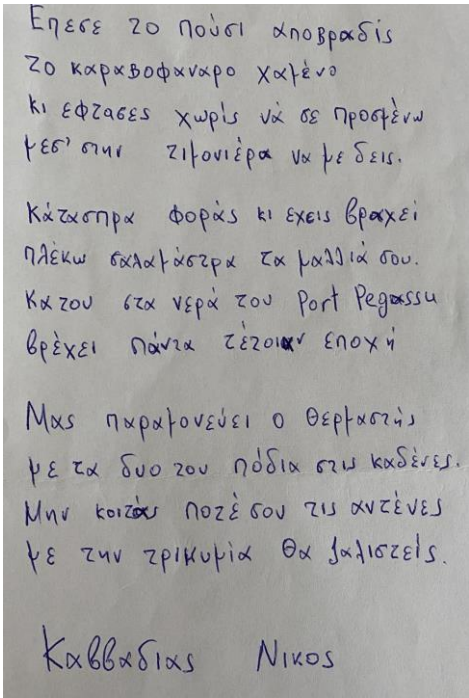
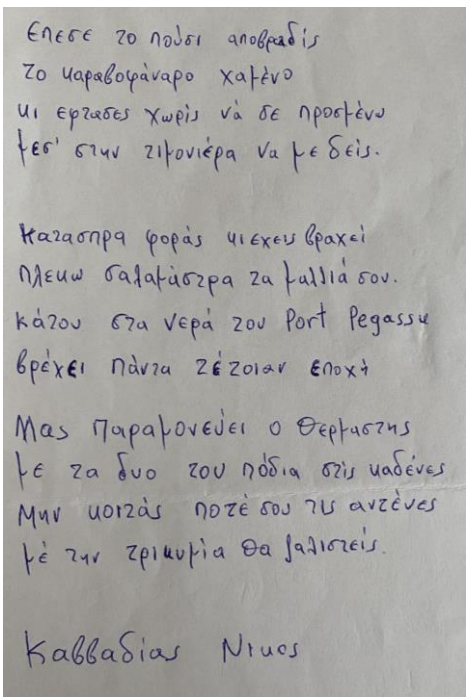
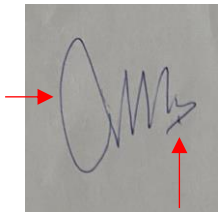
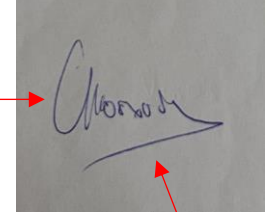
Between the disguised and the normal writing, the letter formation obviously shows similarities.



### Sample 11

Writer's profession: Mathematician

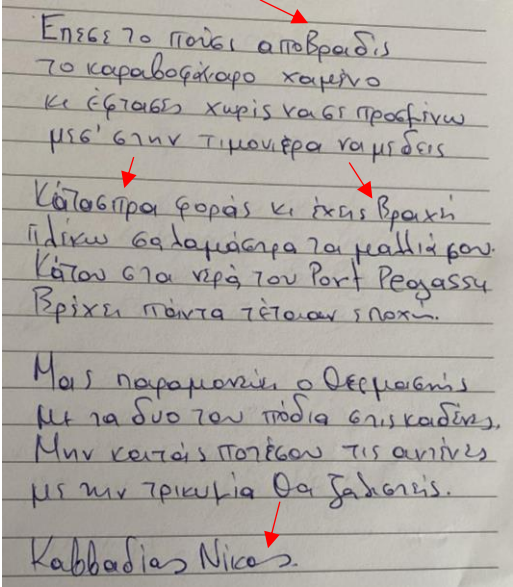
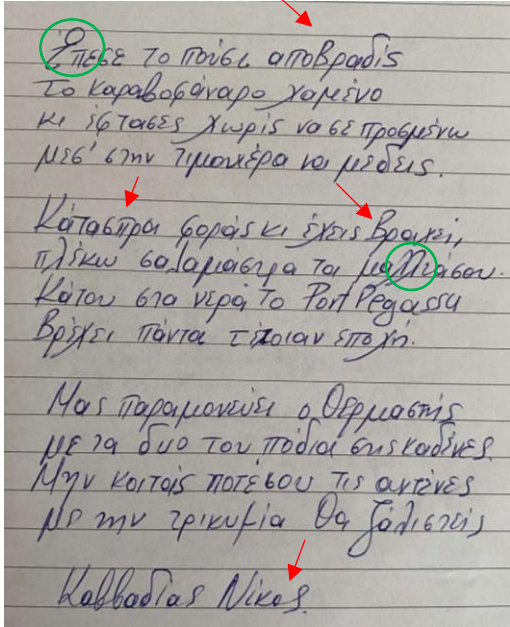
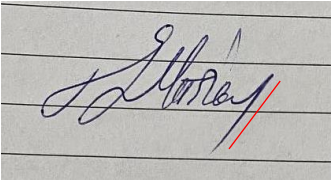
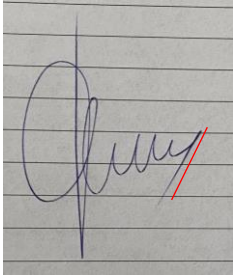
**Table 11**

Normal writing	Disguised writing
	
Normal signature	Disguised signature
	
<p><u>Significant similarities (red symbols) and methods of disguised writing:</u></p> <p><u>Text</u></p> <ul style="list-style-type: none"> <li>Utilization of space similar</li> <li>No unnatural pen lifts or blobs of ink</li> <li>More natural writing</li> <li>Moderate speed</li> <li>Similar pressure pattern</li> <li>Similar margins</li> <li>Same proportions</li> </ul> <p><u>Signature</u></p> <ul style="list-style-type: none"> <li>The same slant</li> <li>The same ending</li> <li>The same loop</li> </ul>	<p><u>Significant differences</u></p> <p>The writer in the normal signature signs with initials whereas in the disguised signs with the whole surname.</p>
<p><u>Observations:</u>  Between the disguised and the normal writing, the letter formation obviously shows similarities.</p>	

## Sample 12

Writer's profession: Economist

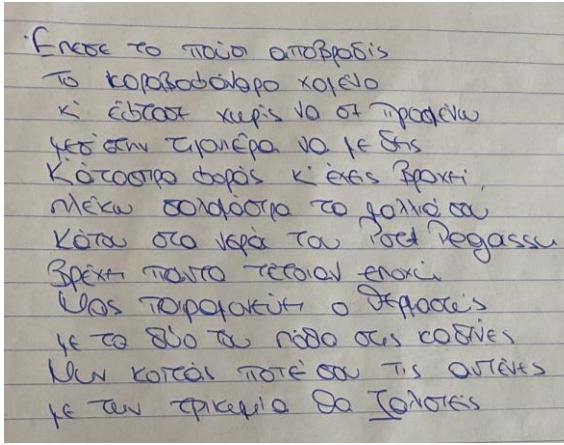
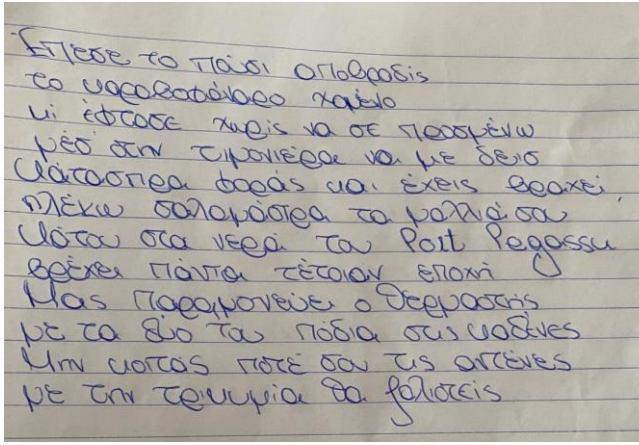
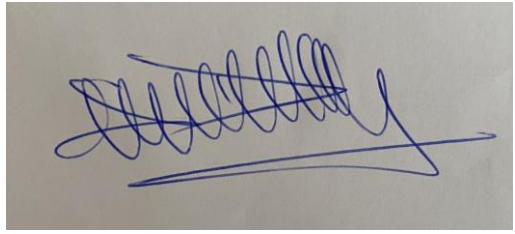
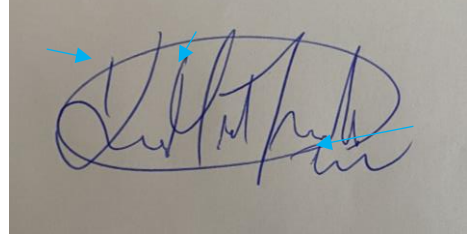
Table 12

Normal writing	Disguised writing
	
Normal signature	Disguised signature
	
<p><u>Similarities (red symbols) and methods of disguised writing:</u></p> <p><u>Text</u></p> <ul style="list-style-type: none"> <li>• Utilization of space similar</li> <li>• No unnatural pen lifts or blobs of ink</li> <li>• More natural writing</li> <li>• Moderate speed</li> <li>• Similar pressure pattern</li> <li>• Similar margins</li> <li>• Same proportions</li> </ul> <p><u>*Signature</u></p> <ul style="list-style-type: none"> <li>• The same ending</li> </ul>	<p><u>Significant differences</u></p> <p><u>Text</u></p> <p>In the disguised writing the slant is on the right whereas in the normal there is a lack of slant.</p> <p><u>Signature</u></p> <p>The disguised signature shows differences compared to the normal one, however *</p>
<p><u>Observations:</u></p> <p>Between the disguised and the normal writing, the letter formation obviously shows similarities.</p>	

**Sample 13**

Writer's profession: Lawyer

Table 13

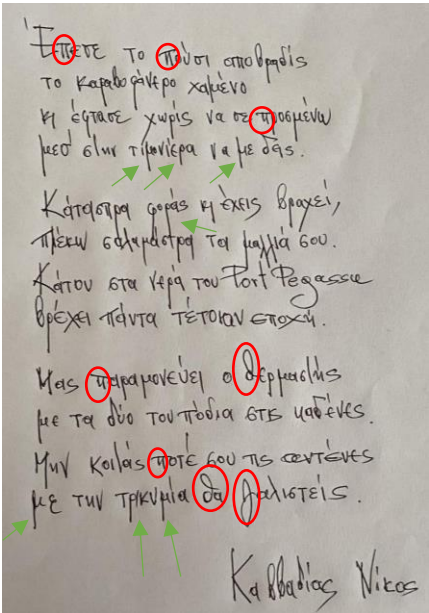
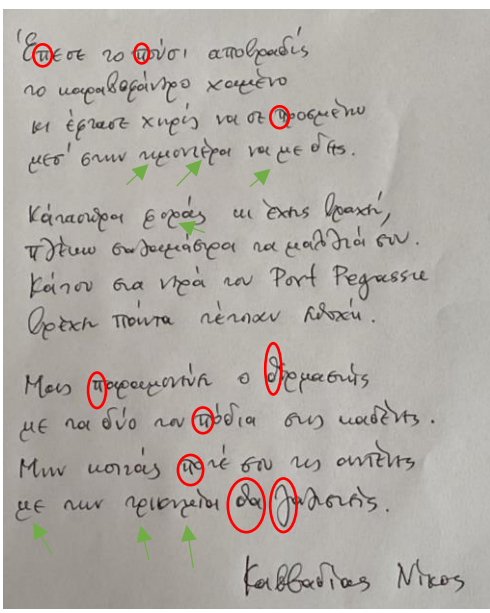
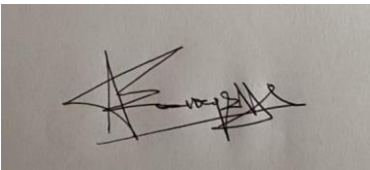
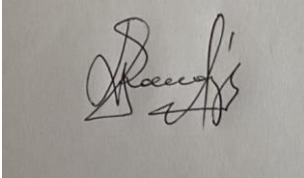
Normal writing	Disguised writing
	
Normal signature	Disguised signature
	
<p><u>Significant similarities (red symbols) and methods of disguised writing:</u></p> <p><u>Text</u></p> <ul style="list-style-type: none"> <li>• Utilization of space similar</li> <li>• No unnatural pen lifts or blobs of ink</li> <li>• More natural writing</li> <li>• Moderate speed</li> <li>• Similar pressure pattern</li> <li>• Similar margins</li> <li>• Same proportions</li> </ul>	<p><u>Significant differences</u></p> <p>The disguised signature shows differences compared to the normal one, please find below the most important differences:</p> <ul style="list-style-type: none"> <li>• In pictorial appearance</li> <li>• In speed: the disguised signature is slower</li> <li>• In pen lifts/stops (please refer to my comment below)</li> <li>• In terminating strokes</li> </ul>
<p><u>Observations:</u></p> <p>Between the disguised and the normal writing, the letter formation obviously shows similarities. The signature is quite unusual, has a lot of unnatural pen lifts/stops and there is an unnatural flow (please refer to the blue symbols).</p>	



**Sample 14**

Writer's profession: Civil Engineer

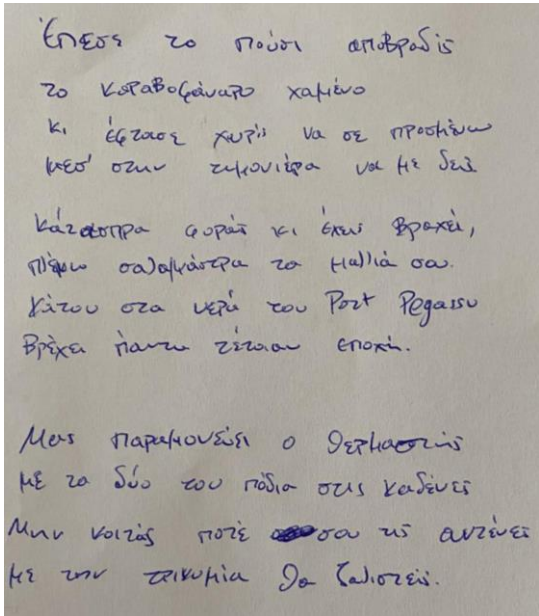
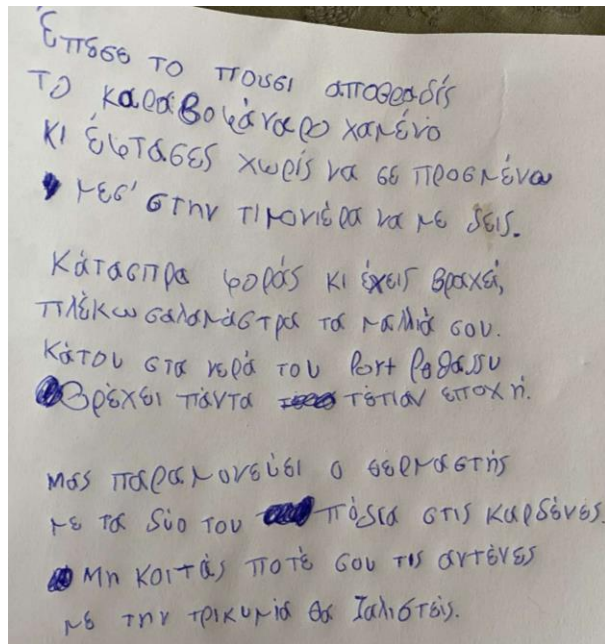
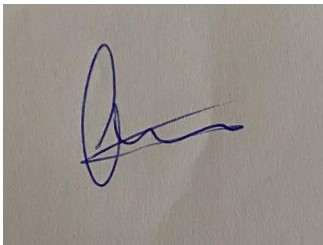
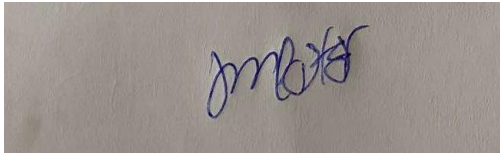
Table 14

Normal writing	Disguised writing
	
Normal signature	Disguised signature
	
<p><u>Significant similarities (red symbols) and methods of disguised writing:</u></p> <p><u>Text</u></p> <ul style="list-style-type: none"> <li>Moderate rhythm</li> <li>No unnatural pen lifts or blobs of ink</li> <li>More natural writing</li> <li>No patching</li> <li>Correct master pattern</li> <li>Similar spacing</li> </ul>	<p><u>Significant differences</u></p> <p><u>Text</u></p> <p>Deviation from model (i.e. the strokes of lower case “μ” and “π” are straight and long in normal writing, whereas in the disguised writing the strokes of lower case “μ” and “π” are stubby and curved (please refer-indicatively-to green symbols)).</p> <p><u>Signature</u></p> <p>The disguised signature shows differences compared to the normal one, please find below the most important differences:</p> <ul style="list-style-type: none"> <li>In pictorial appearance</li> <li>In speed: the disguised signature is slower</li> <li>In style: the disguised signature is more cursive</li> </ul>
<p><u>Observations:</u></p> <p>At first sight, the letter formation between the disguised and the normal writing shows differences however from a deep/close observation the letter formation shows some similarities;</p> <p>Letter formation: In the normal text the writing is more angular than the disguised one; also, there is a unique characteristic in the way where the lower case “π” is drafted. In particular, its stems are connected in the middle (please refer to the red circles).</p>	

**Sample 15**

Writer's profession: IT engineer

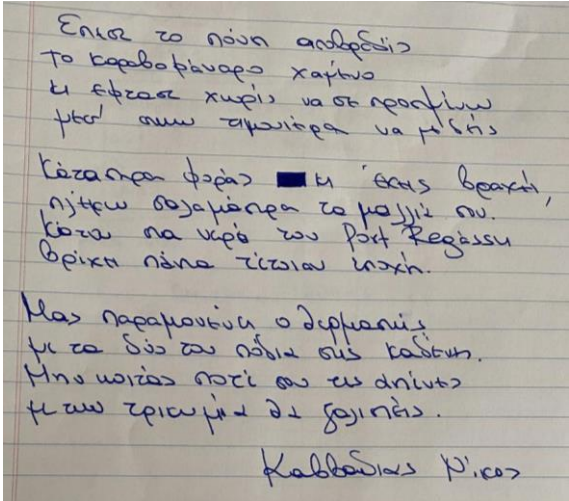
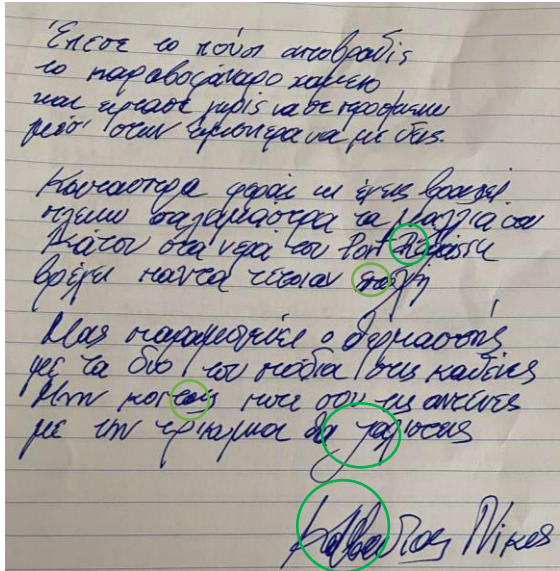
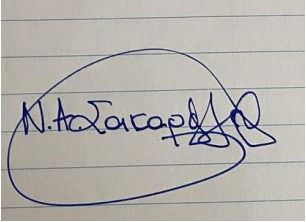
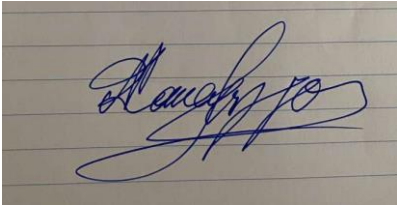
Table 15

Normal writing	Disguised writing
	
Normal signature	Disguised signature
	
<p><u>Significant similarities (red symbols) and methods of disguised writing:</u></p> <p><u>Text</u></p> <ul style="list-style-type: none"> <li>• Deviation from model</li> <li>• Change of size</li> <li>• Similar spacing</li> <li>• Change of hand</li> </ul>	<p><u>Significant differences</u></p> <p>The disguised signature shows differences compared to the normal one, please find below the most important differences:</p> <ul style="list-style-type: none"> <li>• In pictorial appearance</li> <li>• In speed: the disguised signature is slower</li> <li>• In hand used (please refer to my comment below)</li> </ul>
<p><u>Observations:</u></p> <p>The change of hand and the use of the "unaccustomed" hand is an indicator of disguised handwriting. The writers, in general, probably feel that the gross alteration in the appearance of the handwriting is sufficient disguise, and there is no need for them to complicate the already considerable difficulty of the task they are undertaking. The lack of muscular control exhibited by the unaccustomed hand will be reflected in a lack of fluency, poorer rhythm and a crudity in the formation of loops, curves and eyelets which is absent from the normal handwriting.</p>	

**Sample 16**

Writer's profession: Architect

Table 16

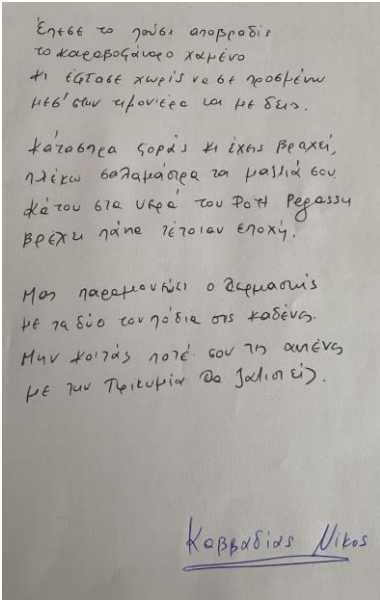
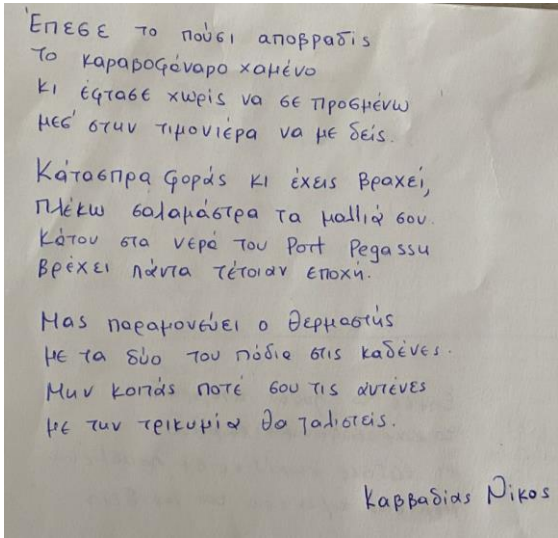

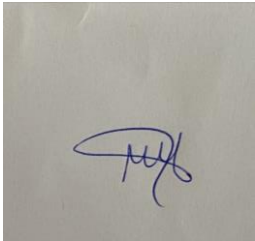
Normal writing	Disguised writing
	
Normal signature	Disguised signature
	
<p><u>Significant similarities (red symbols) and methods of disguised writing:</u></p> <p><u>Text</u></p> <ul style="list-style-type: none"> <li>• Deviation from model</li> <li>• Change of size</li> </ul>	<p><u>Significant differences</u></p> <p><u>Text</u></p> <p>The disguised writing have more connected structures and heavier pressure. Also, in the disguised writing the slant is on the right whereas in the normal there is a lack of slant. Based on the third psychological law of disguised writing (as described above within the Introduction), the said writing modification (right slant) of the disguised writing might have produced a consequential change seen by connected (cursive) strokes within some words (please refer-indicatively-to the green circles).</p> <p><u>Signature</u></p> <p>The disguised signature shows differences compared to the normal one, please find below the most important differences:</p> <ul style="list-style-type: none"> <li>• In pictorial appearance</li> <li>• In pressure: heavier pressure in the disguised signature</li> <li>• In connections: More connected structures in the disguised signature</li> </ul>
<p><u>Observations:</u> There are not many similarities between the normal and the disguised writing. It is noted that <b>the writer has the ability to write with both hands; he is both a right and left-hand writer. This type of writer is ambidextrous.</b></p>	



### Sample 17

Writer's profession: Lawyer

Table 17

Normal writing	Disguised writing
	
Normal signature	Disguised signature
	

#### Significant similarities (red symbols) and

#### methods of disguised writing:

##### Text

- Utilization of space similar
- No unnatural pen lifts or blobs of ink
- More natural writing
- Change of slant (in the normal there is a slant on the right whereas in the disguised there is not any slant)
- Moderate speed
- Similar pressure pattern
- Similar margins

#### Significant differences

The disguised signature shows differences compared to the normal one, please find below the most important differences:

- In pictorial appearance
- In speed: the disguised signature is slower
- In style: the disguised signature has flourishes, a better writing quality whereas the normal signature is more angular and careless.

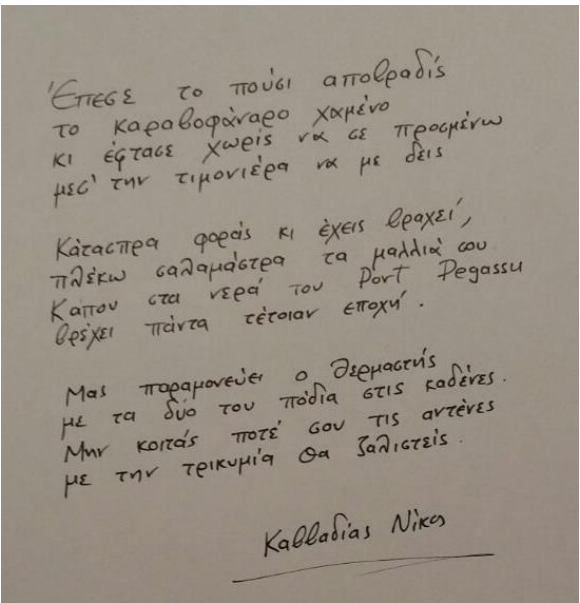
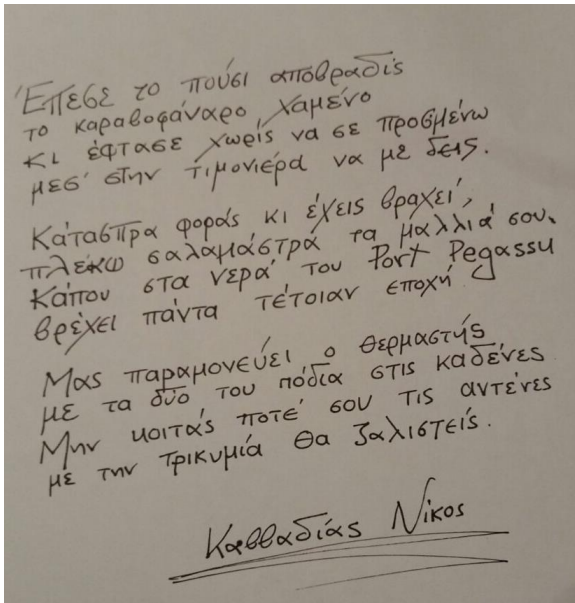
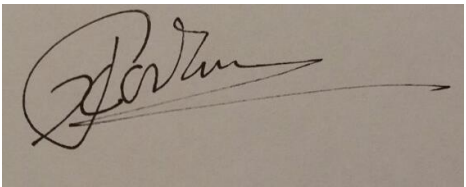
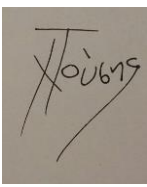
#### Observations:

Between the disguised and the normal writing, the letter formation obviously shows similarities.

**Sample 18**

Writer's profession: Painter

**Table 18**

Normal writing	Disguised writing
	
Normal signature	Disguised signature
	

Significant similarities (red symbols) and methods of disguised writing:

Text

- Utilization of space similar
- No unnatural pen lifts or blobs of ink
- More natural writing
- Moderate speed
- Similar pressure pattern
- Similar margins
- Same slant (i.e. the lines of writing ascend on both normal and disguised writing).

Significant differences

The disguised signature has disconnected writing or unnatural pen lifts.

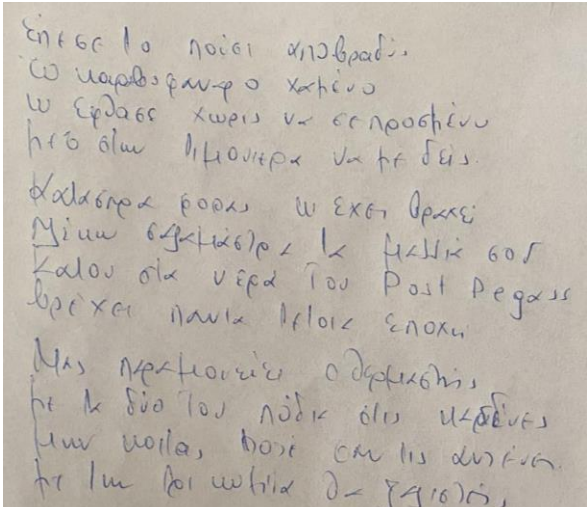
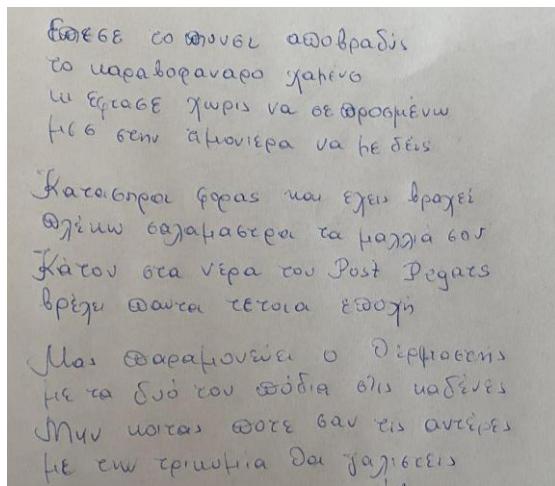
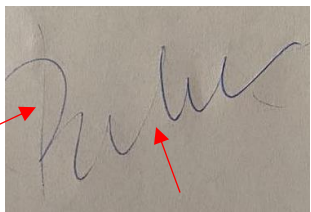
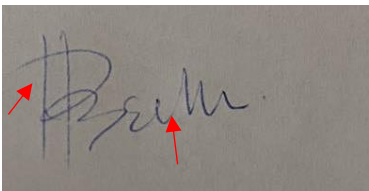
Observations:

Between the disguised and the normal writing, the letter formation obviously shows similarities.

### **Sample 19**

**Writer's profession:** Brigadier (retired)

**Table 19**

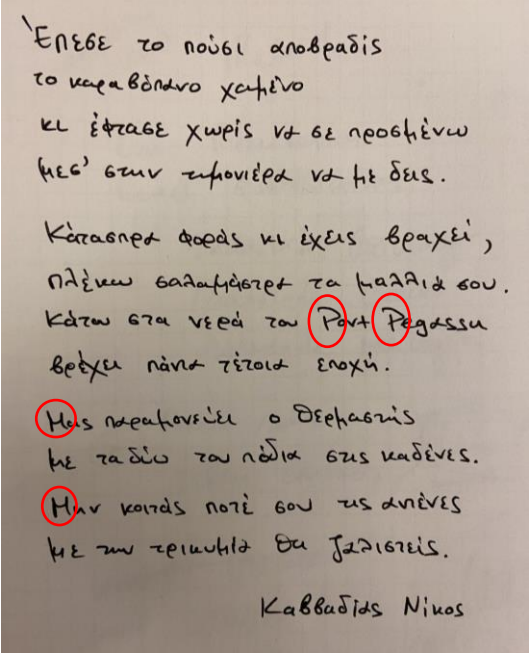
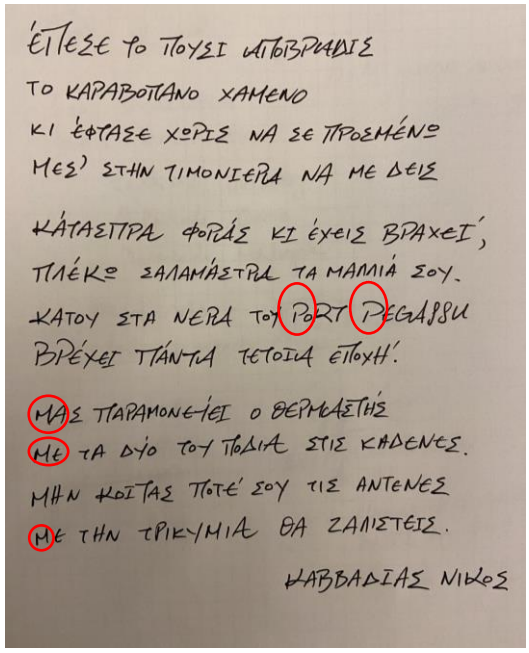

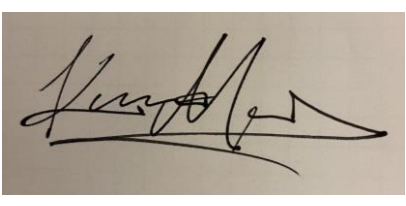
Normal writing	Disguised writing
	
Normal signature	Disguised signature
	

<p><u>Significant similarities (red symbols) and methods of disguised writing:</u></p> <p><u>Text</u></p> <ul style="list-style-type: none"> <li>• More natural writing</li> <li>• Moderate speed</li> </ul> <p><u>Signature*</u></p> <ul style="list-style-type: none"> <li>• The same pressure</li> </ul>	<p><u>Significant differences</u></p> <p>The disguised signature shows differences compared to the normal one, however*</p>
<p><u>Observations:</u></p> <p>There are not many similarities between the normal and the disguised writing.</p>	

**Sample 20**

Writer's profession: Economist

Table 20

Normal writing	Disguised writing
	
Normal signature	Disguised signature
	
<p><u>Significant similarities (red symbols) and methods of disguised writing:</u>  <u>Text</u></p> <ul style="list-style-type: none"> <li>Utilization of space similar</li> <li>No unnatural pen lifts or blobs of ink</li> <li>More natural writing</li> <li>Moderate speed</li> <li>Similar pressure pattern</li> <li>Similar margins</li> <li>Letter formation: with red symbols have been spotted all the letters with unique characteristics, i.e. the capital "P" has a small hook on the top and its loop is not connected with its initial stem in both the normal and the disguised writing; also the capital "M" has the same pressure on the left in both the normal and the disguised writing.</li> </ul> <p><u>Signature*</u> The same pressure</p>	<p><u>Significant differences</u></p> <p>The disguised signature shows differences compared to the normal one, however*</p>
<p><u>Observations:</u>  The basic change in the said sample is the change from lowercase to capital letters, one of the most common disguised methods.</p>	

### **III. Conclusion**

#### **1. General remark**

Taking into consideration the above 20 specimens of handwriting provided, I conclude that in the majority, the disguised handwriting could be successful in small signatures (without letters) or in small texts (1 or two lines) and not in big texts (more than 8-10 lines).

The subtle characteristics of writing are still present and most attempts to disguise handwriting are ineffective. In particular, in a big text the writer faces difficulties trying to be consistent with all the abnormal/unnatural and intentional characteristics. The intense concentration, which is essential for the maintenance of any complicated scheme of disguise, is beyond the capability of the average person. The latter is reinforced from the fact that the structure of the writing is a "product" of the habit and thus can hardly be changed and oppressed.

#### **2. Common methods observed**

A writer who wants to disguise his signature usually makes superficial changes in his handwriting. According to the samples, the most common methods of disguise observed are the following:

- Change of slant;
- Altered letter forms;
- Change of size of the letters;
- Change of speed;
- Use of the unaccustomed hand; and
- Change from lowercases to capital letters.

#### **3. General observations**

##### **3.1. *Signature***

As mentioned above, it has been observed that small signatures (not including letters) can be disguised with greater success. In particular, the writes in the samples 5, 6, 7, 14, 15, 16, 17, 18, 19 were proceeded with a successful disguised signature. On the other hand, in the samples 8, 9 and 11, where there are some letters in the disguised signatures, similarities with the normal signatures can be easier identified.

##### **3.2. *Text***

While the majority of the samples showed that indeed the disguised handwriting cannot be performed with success, there are a couple of writers (especially those in samples 5, 16, and 19) who due to their abilities are able to change their handwriting in a way that it cannot be identified.

In particular, the writer in the sample 5 is an experienced document examiner, which means that he is aware of the disguised methods, he can avoid drafting in a way that his handwriting can be identified and thus he can produce a disguised handwriting with success. Also, the writer in the sample 16 is an architect with the ability to write with both hands and due to his high innate artistic ability is probably able to change his handwriting in a way that it cannot be identified. Bearing in mind the latter, it is obvious that the profession and the abilities of a writer can play a crucial role to the production of a disguised handwriting.

Fortunately, these people are in a small minority, and the number who use their talents illicitly even smaller, so that their existence has little practical effect on the application of the principles concerning the effect of the disguise on the rhythm and fluency of handwriting in general<sup>6</sup>.

### **3.3. The power of the repetition**

Apart from the above, I strongly believe that even if there are some people that could proceed with a successful disguised writing, as the writers in the above-mentioned samples, on repeated occasions they will not be able to keep a consistency. To be more specific, if those people will be requested to produce the same disguised text or the same disguised signature for multiple times, I am sure that they will not be able to give the same result and the disguised texts/signatures will show inconsistencies and differences.

In light of the above, I would conclude that the safest diagnosis of a disguised handwriting requires the following (if possible):

A sufficient number of formal specimens of handwriting (both text and signature) drafted multiple times;

The samples written in an unsuspected time and in “timely closed” date to the date when the questioned writing/signature was drafted.

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- *Lydia Moshcou was admitted to the Athens Bar of Association in 2013 and I had been admitted to practice in Luxembourg, under her Greek professional title, for the period 2020-2021.*
- *Since 2019, I am practicing as a forensic document examiner in Mrs. Christina Tousi’s office, who is a forensic document examiner based in Athens, graduated from University of Gratz (Criminology Institute), being also a member of GESELLSCHAFT FÜR FORENSISCHE SCHRIFTUNTERSUCHUNG (GFS) e.V.*

<sup>1</sup> *“Suspect Documents”*, Second Impression with Supplement 1966, Wilson R. Harrison, Sweet & Maxwell Limited, pg. 353



The sports memorabilia and autograph industry has been viewed a profitable business since the 1800's. Unlike some other trends, sports collectibles and autographs was not merely a fad. There has been an ever-increasing demand for sports memorabilia and autographs by young and old collectors worldwide. Because of the popularity and profitability of these autographs, the industry has become plagued by a series of forgery scams. The Federal Bureau of Investigation (FBI) has said that the fraud/forgery sports industry epidemic may account for upwards of five hundred million (\$500,000,000.00) dollars in losses annually.

In the mid 1990's, the FBI Chicago Division initiated "Operation Bullpen". This investigation targeted a sports memorabilia forgery group. The investigation revealed that this network of forgers was not only composed of expert autograph "fakers" but also trusted sports memorabilia dealers, distributors, and sports authenticators. The autograph forgery ring documented sales of approximately one hundred million (\$100,000,000.00) dollars for forged sports autographs and other collectibles sold through the internet, auctions and sports shops. During the investigation, evaluations were made by the top sports authenticators in the industry of the more popular sports autographs on the market. It was determined that among ten thousand (10,000) autographs of Tiger Woods and Michael Jordan, only thirty-three (33%) percent were authentic. The process used by the forgers was complex and well thought out. One example involved autographs on a baseball. In this case, the forger would purchase ordinary baseballs from a store with no distinguishable marks or labels. They would then wash the balls with soap and water. The balls were then provided to the "Master Forger" who would sign the balls using a fountain pen from Babe Ruth's era, 1930s to late 1940s. The balls would not look antique so they would dip the balls into a gallon of orange-rust shellac varnish to make them appear aged. It has been said that many Babe Ruth autographs were shellacked during his time to preserve the autograph. The process was nearly finished but the balls not only needed to look old, they needed to smell old. The balls were then put in bags of dog food for days then left in the sun to give them a "vintage" odor. Many of the participants of this fraudulent group were prosecuted and incarcerated. Although a significant number of forged autographs were confiscated throughout the investigation, a large number of forged items were never recovered and are believed to be actively bought and sold throughout the marketplace today.

The most talented counterfeiter forgers use vintage paper, ink and other authentic supplies. These master forgers have been so successful with perfecting their craft, they not only deceive experts but even fool the athlete themselves. At a national sports card collectors show in Atlanta, Ga in February 1997, Joe Montana (SF 49ers Hall of Fame Quarterback) was handed a forgery of his own signature. After studying the signature, Montana confidently stated that the autograph was authentic. When Montana was told the autograph was a forgery, he could not believe it. According to PSA/DNA Authentication Services, they reject an astounding fifty percent (50%) of all autographs sent to them for authentication based on forgery. Due to the well documented forgeries being sold throughout the marketplace, sports figures have been able to capitalize on this opportunity by charging an excessive fee for in-person autographs at the various sports shows and arenas throughout the country.

Although the FBI and other federal, state and local law enforcement agencies have vowed to make investigating and prosecuting forgers of sports memorabilia a priority, the reality is it still remains low on their list of priorities. In the rare instance when a forger of memorabilia is prosecuted, they rarely receive a prison sentence that exceeds one (1) year.

Legitimate sports memorabilia dealers have become adversely affected by these fraudulent sellers and forgers. Reputable dealers are attempting to combat this issue by coming up with different ways to deter forgeries while building assurance in consumers regarding the sports memorabilia market. Some methods being deployed include added steps to the authentication process, tamper proof holographic seals, notarized letters from the athletes, life-time guarantees of authenticity and online registry of items that purchased or sold through the dealer to confirm authenticity of the autograph.

Detecting forgeries of sports memorabilia must be performed by skilled investigators due to the various methods used by forgers. The following are the types of known fake/forged sports autographs:

**Forged** – these are accomplished through copying an athlete's signature, the stroke such as, the pen used. A forger hand signs the sports memorabilia using their expertise and they must know the science of how sports stars make their signature. Expert forger, Greg Marino, said that in order for him to master Joe DiMaggio's autographs on baseball bats, he repeatedly watched video showing DiMaggio himself signing bats at the Louisville Slugger factory. Marino stated that he and DiMaggio had very similar handwriting characteristics. Marino forged sports autographs from 1994 – 1999.

**Autopen** – this machine signs autographs following a designated signature installed on a template. This machine is capable of recreating signatures. Some of the characteristics to look for when attempting to detect autopen signatures is a consistent thickness or thinness through the entire signature. Also, take note of dots of the letter i or at the end of a signature that are the identical size or thickness.

**Secretarials** – these are signature forgeries that are authorized by the athlete but still do not pass as authentic sports autographs. The signers could be a secretary or another individual hired to do the job.

**Sports autograph reprints** – are merely printed copies of signatures. These reprints are easy to detect by simply touching the signature. If it feels the same as the texture of the entire surface of the item, it is likely a reprint. Another method to confirm the autograph is a reprint is to see the back of the autographed picture or card under light. If you find no signature impression on the back, it is likely a reprint.

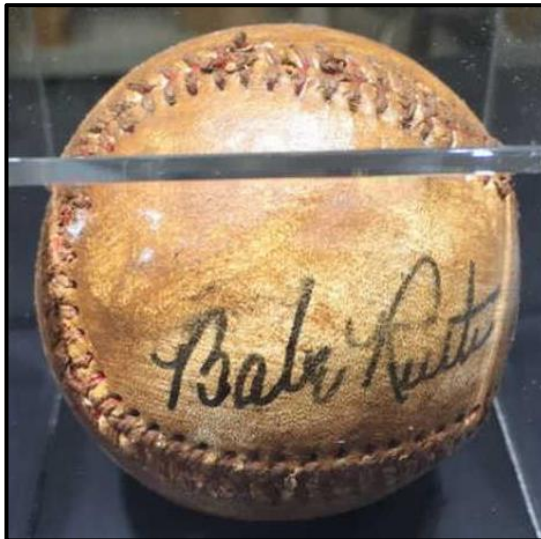
**Stamped Autograph** – are very easily detectable because of the ink quality. A review of the ink in these types of circumstances typically reveal a smudgy appearance.

The best defense against being scammed by a forged sports autograph is to educate yourself and think like a forger. If you study the various sports figure's signatures closely, you will become

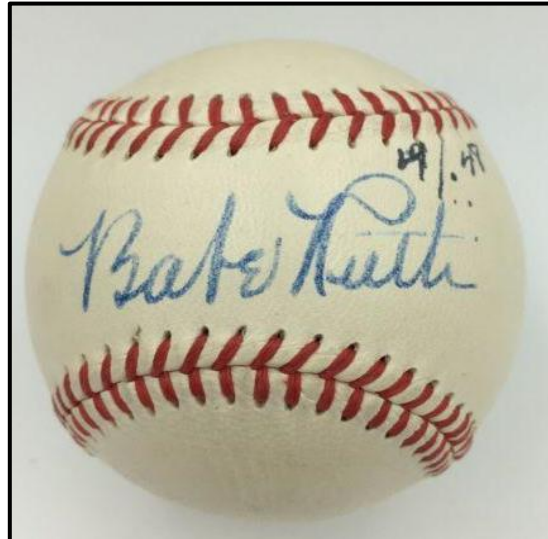
familiar with the strokes, rounds, lines, dots and overall characteristics of the signature. If you intend to invest in a sports autograph, it is highly recommended that you secure the services of an expert who is trained to investigate the signature and make an educated finding as to the authenticity of the item.

In closing, the forgery of the signatures of infamous athletes has become an extremely profitable industry with very little legal oversight and minimal criminal penalties. The ever-demanding responsibilities of law enforcement with public safety duties will continue to diminish the resources available to investigate and prosecute forgers in the industry. Unfortunately, the fraudulent activity of these individuals may eventually lead to the end of a long enjoyed and respectable hobby enjoyed by so many, young and old. Case Study: Babe Ruth Forgery

**Forged**



**Authentic**



Case Study: Michael Jordan Forgery

Babe Ruth:

This forgery appears to be skilled and has many similar characteristics as the genuine autograph. Upon comparing the two, the following are my observations:

The serif in B is very different between the two

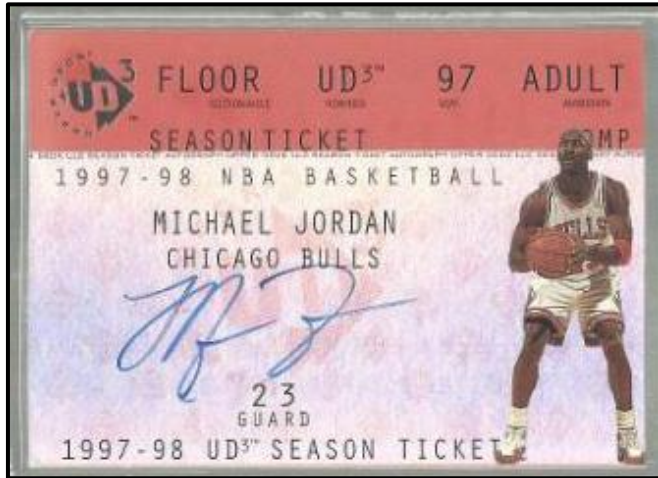
The top loop of "R" is smaller in genuine than the forgery

The cross bar of "t" is much longer in the genuine autograph

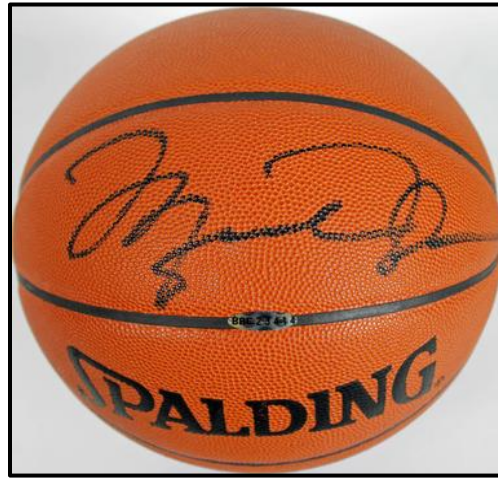
There is a connector stroke from "B" to "a" in genuine but none visible in forgery

There is a much heavier pen pressure in the forgery

**Forged**



**Authentic**



Michael Jordan:

This forgery is easier to detect. Upon comparing the two, the following are my observations:

The overall letter structure of both the "M" and "J" are vastly different between the genuine and forged autographs.

The unique lower stroke of the "M" on the genuine autograph is completely different in structure than the forgery

The overall spacing is consistently greater in the genuine autograph

I believe my observations identify the major differences between the genuine and forged autographs

Richard Cope has completed the Forensic Document Examination International Training Program and this is his research paper. He has testified on numerous occasions in federal, State and Municipal court.

He is a twenty-five-year member of an award-winning Federal Law Enforcement agency

## How Many Signatures Do You Really Need?

Katherine Koppenhaver

Once a writer has mastered the art of handwriting, his signature is executed smoothly and easily without conscious awareness of the characteristics of writing. Since your signature is the most frequently executed handwriting, habits become ingrained.

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.

One known signature would be acceptable in cases where the writer who denies his signature is very consistent and his identifying characteristics are obvious in both the known and the questioned when the questioned document is genuine.

In the State versus Jeffrey Lee Greenspan one known signature was compared to three signatures that the defendant denied writing. As illustrated In Figure 1 there is sufficient agreement in all of the questioned signatures when compared with the known signature. The document examiner had no trouble convincing the trier of fact that the questioned signature was genuine.

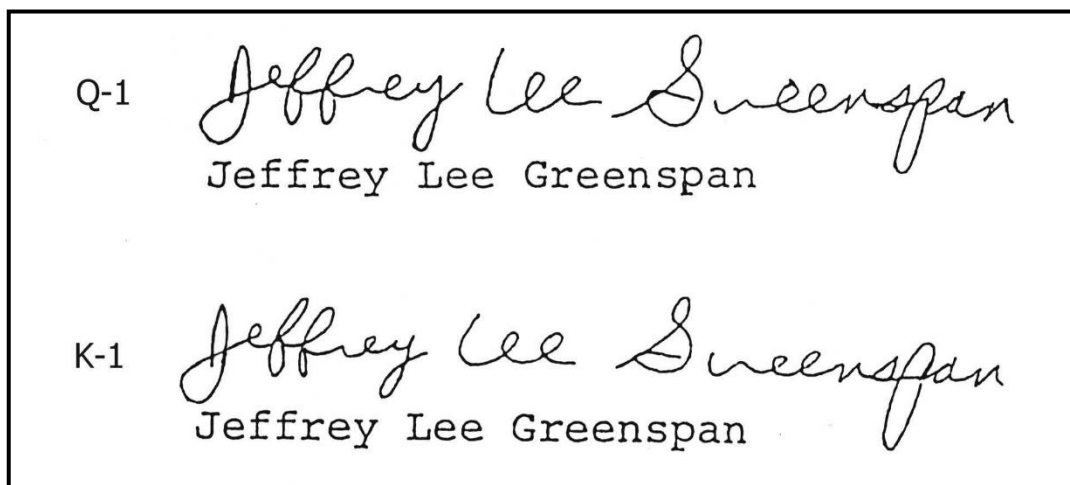


Figure 1

In the case of The Federal Office Supply versus David Thomas AKA David Anthony, only one signature of David Thomas was available for comparison with a signature of David Anthony.

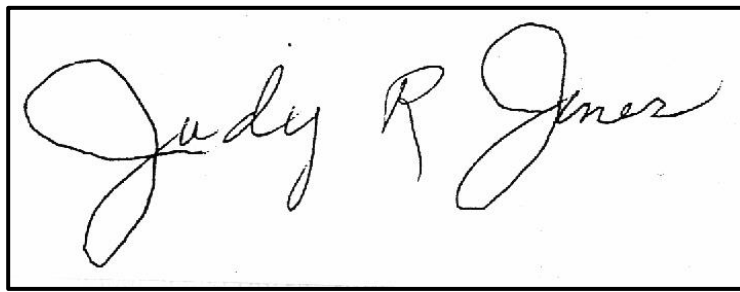
How Many Signatures Do You Really Need?  
Katherine Koppenhaver

The signatures contained enough similarities even though the last names differed. Before the expert

witness could be sworn into court, the defendant admitted that he had signed the questioned document.

When a fraudulent signature is a simple forgery, one exemplar should be sufficient to demonstrate the differences between the known and the questioned. 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 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.

A handwritten signature in cursive script, reading "Judy R Jones". The signature is enclosed within a thin black rectangular border. The ink appears to be black on a white background. The letters are connected in a fluid, cursive manner, with some variations in line thickness and a few small pen lifts.

**Figure 2**

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."

When a questioned signature is written with a higher skill level than the known writer could not execute, a single signature would be sufficient to determine the facts.

There are several types of cases in which it is possible to identify fraudulent signatures without any exemplars.

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 at the wrong direction indicating that it was written backward is not 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

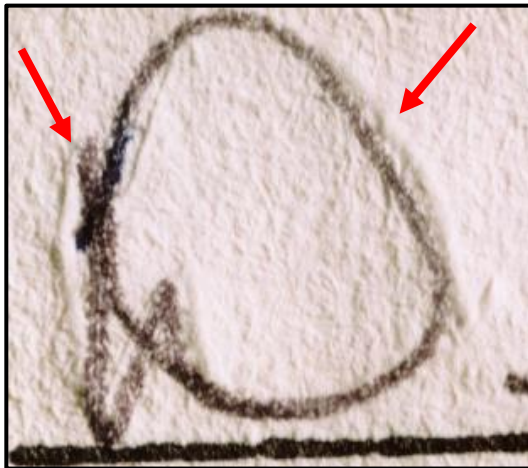


example, the signature of a blind person was in question. The signature block on a form was very small and contained some printed letters. The signature not only stayed within the very small box, it curved around the printed letters, something a blind person could not do.

Since no one can write his signature exactly the same way twice, identical signatures are always evidence of non-genuineness. This would include traced forgeries, scanned signatures or even free-hand simulations as well as cut and paste signatures.

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.

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. (See Figure 3).



**Figure 3**

Forgers are scanning genuine signatures into a computer and printing them on their colored ink jet printers in order to pass them as genuine signatures. A magnifying glass is sufficient to reveal 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.

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.

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.

The signatures used for comparison purposes should not be request writing taken after the fact. Documents should be gathered that are similar in nature to the questioned signatures dated around the same time as the questioned document. 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 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.

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.

## How Many Signatures Do You Really Need?

Katherine Koppenhaver

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 used 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 his client.

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 present, the document examiner can give an opinion of spuriousness.

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

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