

## **FORENSIC COMPARISON OF FULL SIGNATURES WITH INITIALS**

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### **ABSTRACT**

Signatures are the written illustration of someone's full name or nickname which usually become a part of the automatic writing habits because of its frequent use by some individuals in daily routine and thus have forensic implications. Present study has been conducted on the inter-se comparison of full signatures and initials with an aim to determine, if full signatures of an individual can be compared with his corresponding initials or not.

The present study is based on a sample of 50 individuals from schools, colleges, universities, police stations, and cantonment areas, who were working as army officers, police officers, teachers, and research scholars. Two types of signature specimens, including full signatures and initials, were collected on A4 size paper side by side, from each individual who had given their written consent. The full signatures and initials of every participant were qualitatively analysed and compared inter-se with regard to handwriting characteristics, such as pen lifts, retouching, speed, letter forms, formation of characters, embellishment, simplification of strokes, size, and slant. It is concluded that full signatures and corresponding initials of the majority of participants have presented significant similarity in the observations of characteristics, such as speed, letter form, formation (direction of strokes), and slant. However, full signatures and initials of some participants have revealed significant differences in characteristics, such as pen-lifts, retouching, formation (number of movement impulses), embellishment, and size. In addition, the initials of these participants have revealed completely different characteristics and styles in their initials, which have presented difficulty in identification of common characteristics with respect to their corresponding full signatures. Therefore, it is imperative for forensic document examiners to collect similar standards, that is, known signature and initials specimens for comparison with the signature and initials specimen in question.

### **INTRODUCTION**

Signatures are the written illustration of someone's full name or nickname. These are a special class of handwriting which includes flourishes and special

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characteristics. Signatures usually become a part of the automatic writing habits because of its frequent use by some individuals in daily routine. Every signature of an individual varies to some degree with respect to the master pattern. Individuals tend to simplify their signatures and use some marks instead, while signing multiple documents in succession. In addition, initials are used by many individuals on a regular basis for signing certain official documents, files, attendance or entry registers, etc. Initials are short signatures that mostly involve the first two letters of the name or a word. These are acceptable like full signatures in official or important documents. Some professionals like doctors, professors, engineers, teachers etc. execute initials on the documents for either saving time or using short forms for their names (mostly those having a very long name).

Some writers may incorporate abbreviations of their rank (or designation) or certain distinctive styles during the execution of initials, which may help in their identification (Huber and Headrick, 1999).

Controversies may be raised over the genuineness of important legal documents, such as contracts, wills, receipts, etc., due to the execution of initials on these documents instead of signatures. In addition, it may get difficult for the forensic document examiners to compare the disputed signatures with the initials (short signatures) of an individual and vice versa, in case of the unavailability of contemporary and similar types of standards. Sharma *et al.* (2019) have suggested that it becomes difficult to prove the genuineness of signatures, when the subject uses completely different writing characters in full signature and initials.

Previous research workers have reported studies on similarities and differences in characteristics between full signatures and initials (Galbraith, 1981; Hilton, 1982; Widla *et al.*, 1990; Totty *et al.*, 1996; McClary *et al.*, 1997; Huber and Headrick, 1999; Chattopadhyay *et al.*, 1999; Lewis *et al.*, 2017; Sharma *et al.*, 2019; Genc *et al.*, 2020). From the review of literature, it has been demonstrated that every person has his own personal style of writing their initials and it is very difficult to authenticate the initials if it is written as a single entity and moreover in an individual way. However, all these studies lack extensive research on the comparative analysis of characteristics in signatures and initials.

Thus, the present study has been conducted on the inter-se comparison of full signatures and initials with an aim to determine, if full signatures of an individual can be compared with his corresponding initials or not.

## **MATERIALS AND METHODS**

### **Collection of full signature samples and initials**

The present study involved participation of 50 individuals. Specimens were collected from all the participants by visiting various schools, colleges, universities, police

stations, and cantonment areas. Individuals who were working as army officers, police officers, teachers, and research scholars were included in this study. Individuals who agreed to participate in the study were asked to read and sign the consent form. Socio-demographic details of all those individuals were then obtained and tabulated, which included name, gender, age, occupation, and educational qualification (Table-1). In addition, information regarding the regular or occasional use of full signatures and initials was obtained from all the participants and a total count related to the same was tabulated (Table-2).

**Table-1: Socio-demographic details of all participants**

Information	Category	Total Count of Participants	Percentage (%)
<b>Age</b>	Below 40	37	74%
	41-50	5	10%
	51-60	8	16%
<b>Gender</b>	Male	36	72%
	Female	14	28%
<b>Educational Qualifications</b>	Graduation	22	44%
	Postgraduation	20	40%
	PhD	8	16%
<b>Occupation</b>	Teachers	23	46%
	Police and army officers	7	14%
	Students/Research Scholars	20	40%

**Table-2: Total count of participants using initials and full signatures on regular or occasional basis**

Category	Total Count of Participants			
	Initials used on regular basis	Initials used occasionally	Full signatures used on regular basis	Full signatures used occasionally
Teachers	21	2	23	0
Police/Army officers	7	0	7	0
Students/Research scholars	8	12	4	16

In order to achieve the objective of the study, two types of signature specimens were collected, which included full signatures and initials. All the participants were requested to provide 50 samples each of full signatures and initials, executed side by side on the given A-4 size paper.

### Analysis

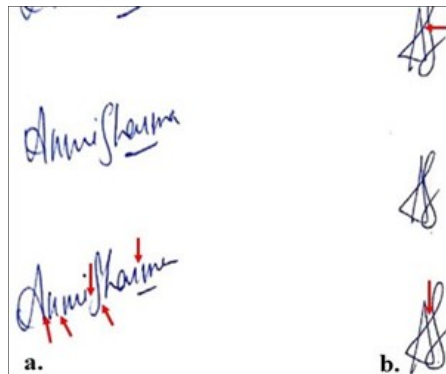
All the collected full signatures and initials of every participant were qualitatively analysed and compared inter-se with regard to handwriting characteristics, such as pen lifts, retouching, speed, letter forms, formation of characters, embellishment, simplification of strokes, size, and slant.

### RESULTS

The following observations were made during the analysis and inter-se comparison of characteristics in full signatures and initials of all the participants:

### Pen lifts

The presence of pen lifts was observed in the full signatures of 31 out of 50 participants. Full signatures of these participants showed the presence of pen lifts at mostly starting positions and between the individual letters of signatures. However, initials showed the presence of pen lifts in the initials of only 8 participants as in their corresponding full signatures. Initials of the remaining 42 participants showed no pen lifts as compared to their corresponding full signatures (Figure-1).



**Figure-1: (a) Showing pen lifts in full signatures of a participant; (b) Showing no pen lifts in initial of the same participant**

### Retouching of strokes

Retouching of strokes was observed in full signatures of only 1 participant. However, 15 participants revealed retouching of strokes during execution of initials at starting positions specifically as compared to their corresponding full signatures, showing no retouched strokes at those places.

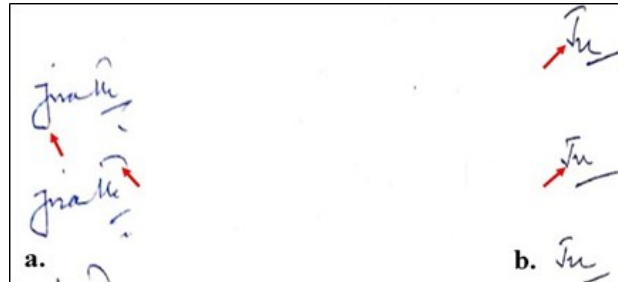
### Speed

Full signatures and initials of 48 participants showed rapid speed, as indicated by the presence of smooth strokes. However, signatures and initials of the remaining 2 participants showed medium speed, as indicated by the presence of both smooth and unsmooth strokes. Thus, no change in the speed of execution of initials was indicated in case of all the participants with respect to their corresponding full signatures.

### Letter forms

Inter-se comparison of full signatures and initials revealed differences in the letter forms or designs of initials of 24 participants with respect to the letter forms observed in their corresponding full signatures. Letter forms of initials executed by 16 out of these 24 participants showed complete change in the designs of letters with respect to their corresponding full signatures (Figure-2).

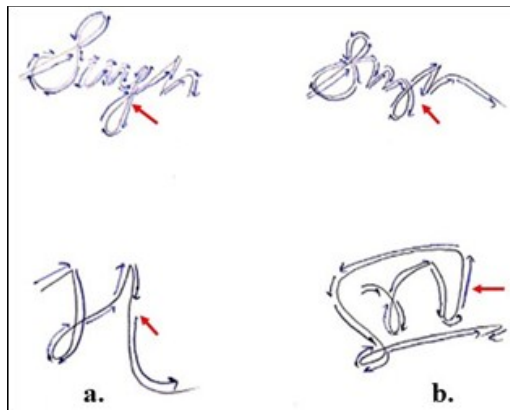
However, initials of the remaining 8 participants revealed partial change in the letter designs with respect to their corresponding full signatures.



**Figure- 2: (a) Showing letter of 'J' in full signature of a participant; (b) Showing change in letter form of 'j' in initial of the same participant**

### Letter formation

Formation of letters was observed on the basis of overall number of movement impulses and direction of execution of strokes while forming letters. The results revealed an increase in the number of movement impulses of letters in the initials of 20 participants and decrease in the case of 11 participants with respect to the number of movement impulses of letters observed in their corresponding full signatures. However, the remaining 19 participants showed no change in the number of movement impulses of letters of the initials with respect to their corresponding full signatures. Change in the direction of letter strokes was observed in the initials of only 19 participants with respect to their corresponding full signatures (Figure-3).

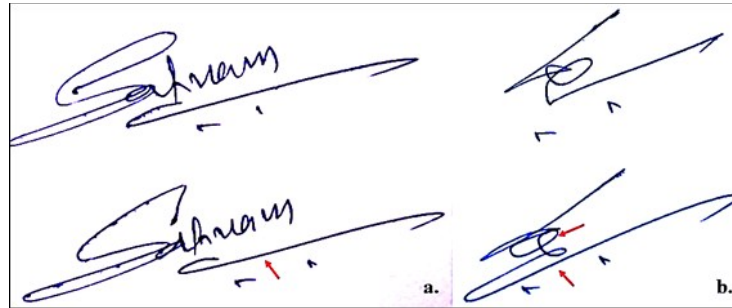


**Figure-3: (a) Showing direction of strokes in formation of letter in full signature of a participant; (b) Showing change in the direction of strokes in formation of letters in initial of the same participant**

### Embellishment

Embellishment of strokes in full signatures and initials was observed in the form of circular loops, extended strokes, flourishes at the starting and ending

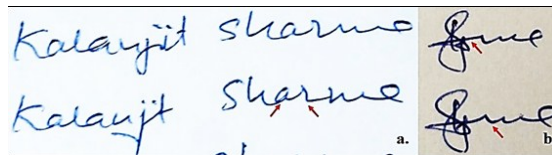
strokes, diacritics, and underlines under the whole full and short signatures. Embellishment was observed in full signatures of 18 participants. However, initials of 43 participants revealed embellishment of strokes as compared to their corresponding full signatures (Figure-4).



**Figure-4: (a) Showing embellishments in full signatures of a participant; (b) Showing embellishment in initial of the same participant**

### Simplification of strokes

Simplification of strokes was observed in full signatures of only 8 participants. However, simplification of strokes was observed in the initials of 42 participants as compared to their corresponding full signatures (Figure-5). Thus, simplification of strokes was observed to be more in case of initials of the majority of participants as compared to their corresponding full signatures.



**Figure-5: (a) Showing formation of strokes in full signatures of a participant; (b) Showing simplification of strokes of the same letters in initials of the same participant**

### Size

Overall range of size of all the letters was measured in full signatures. The observations of full signatures were kept in the 'No change' category, which were then compared inter-se with the overall size observed in their corresponding initials. The results revealed a decrease in the range of size in the initials of 31 participants and increase in the overall size of initials of 15 participants as compared to their corresponding full signatures. However, 4 participants showed similarity in the overall size of full signatures and their corresponding initials.

### Slant

Type of slant was determined in the full signatures of all the participants. The observations of full signatures were kept in the 'No change' category, which

were then compared inter-se with the type of slant observed in their corresponding initials. which was then compared inter-se with the type of slant observed in their corresponding initials. Initials of 12 participants showed complete change in the slant of letters with respect to their corresponding full signatures. However, the remaining 38 participants showed similarity in the type of slant observed in full signatures and their corresponding initials.

## DISCUSSION

Pen lifts have been significantly observed in the full signature specimens of the majority of participants. This is evident from the presence of pen lifts or no connections between individual letters of full signatures. This may be because of the long names of those participants and less frequent use of full signatures in their daily routine. However, pen lifts were not observed in the corresponding initials of the majority of participants, which may be due to the concise size or regular/frequent use of initials in their official documents on a regular basis.

Retouching of strokes has been majorly observed in the initials of some participants. The presence of retouched strokes has been mostly observed at the places of incomplete or illegible letters, which may have been done to complete the form of the letters, to make flourished strokes, or to increase the legibility of strokes. Similar observations have been reported in the previous research studies (Osborn, 1929; Hilton, 1982).

Majority of the full signatures and initials have been executed at rapid speed, as indicated by flying and simplified strokes. This may have been done to finish the task at the earliest. Genc (2020) has also reported that individuals may simplify the strokes during the execution of full signatures as well as initials, while signing multiple pages.

Forms of letters in full signatures and initials of some participants have been found to be completely different, which has been very difficult to compare. In this context, Sharma (2019) has suggested that it may become difficult for the experts to identify similarities or differences between signatures and initials, to prove or disprove the authenticity of signature specimens. In addition, initials of the majority of participants have revealed significant changes in the number of movement impulses with respect to their corresponding full signatures, which may be due to the stylistic formation of letters in the initials executed by those participants.

Initials of most of the participants have revealed the presence of embellished strokes in the form of circular loops, extended strokes, swirls, flourished entry/exit strokes, and diacritics, which may be attributed to the participants' own unique and stylistic characteristics to the initials. In this regard, Genc (2020) demonstrated that signatures may consist of only loops, simple figures or lines as embellishment, but not the characters extracted from the name or surname of the writer. However, Choudhary (2018) mentioned that initials may sometimes show elaborated embellishment, but sometimes they may present hastily

embellished strokes. In addition, the majority of the initials have been observed as only simplified and shortened forms of full signatures.

In the present study, it has also been observed that the participants, who use initials on a regular basis, have presented very unique and completely different letter forms in their initials. However, the participants using initials on an occasional basis have presented maximum characteristics like those of their corresponding full signatures, giving the impression that they are exact shortened copies of the full signatures.

### CONCLUSIONS

It has been concluded that full signatures and corresponding initials of the majority of participants have presented significant similarity in the observations of characteristics, such as speed, letter form, formation (direction of strokes), and slant. This has caused these initials to be exactly duplicate, but shortened forms of full signatures, indicating no marked difficulty in comparing signatures and initials of those participants.

However, full signatures and initials of some participants have revealed significant differences in characteristics, such as pen-lifts, retouching, formation (number of movement impulses), embellishment, and size. In addition, the initials of these participants have revealed completely different characteristics and styles in their initials, which have presented difficulty in identification of common characteristics with respect to their corresponding full signatures.

So, it is imperative for the forensic document examiners to collect similar standards, that is, known signature specimens for comparison with the signature specimen in question. The same is true for the examination and comparison of initial specimens. Sometimes, it may be difficult to get proper standards, if the suspect is not available to provide the requested specimen or his standard specimens are not available. The results of the study will hopefully assist the document examiners in solving such cases, where they are presented with the comparison of full signatures with initials of a person, due to unavailability of similar standards.

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