

Sequential Preferences of Selected Individual Characters in Simulated Forgery

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ARTICLE INFO

Article History:

Accepted : 20 April 2025

Published: 25 April 2025

Publication Issue :

Volume 12, Issue 2

March-April-2025

Page Number :

1152-1155

ABSTRACT

Questioned documents play a vital role as primary evidence in most cases. Graphology refers to the study of handwriting. Signature refers to the unique characters or symbols written by individuals over time which is impossible to be duplicated by others perfectly. Imitation of others' signatures is known as signature forgery. Simulated forgery is when a person tries to imitate a signature by seeing the original signature. In this study 450 samples were collected from 45 subjects with every 10 samples of simulated forgery and four individual characteristics namely loop, hook, cusp, and retrace were analyzed using a stereomicroscope. In this study, the result seems that the curved characters are difficult to execute by the subjects whereas the other types of characters were easily executed. This gives a chronological order, in which the individual character such as the hook goes first followed by the cusp, loop, and retrace.

Keywords – forensic graphology, questioned documents, simulated forgery, signature imitation, individual characters.

I. INTRODUCTION

Graphology is the study of handwriting. Forensic graphology refers to the study of handwriting especially found in ransom notes, suicide notes, blackmail demands, and legal papers. Forensic handwriting analysis is done by comparing the suspected document with one or more original documents determining within a reasonable degree of certainty whether the document is written by the

same person or a different person. A document refers to any materials that have marks, signs, or symbols that convey messages to someone. The majority of the writing instruments are pens, pencils, or any typewriting machines and the material is paper in majority. The term questioned document was coined by the father of the questioned document Dr. Albert S. Osborn which refers to the document that is suspected of its authenticity. Handwriting examination enables the examiner to differentiate the forged document

from the original one. The class characteristics in handwriting refer to the characters that are common to a group of people including spacing, alignment, size, shape, etc., and the individual characters refer to the characters that are unique to an individual which may include loop, hook, cusp, retrace, etc.,. A signature is any mark or sign made by an individual to signify their approval or obligation. The different types of signatures include wet signatures, signatures, and digital signatures. An alteration or modification made physically, chemically, or mechanical means to the signature is known as the signature forgery or imitation of one's signature. The alteration may include additions, erasures, and obliterations. Three major types of forgery include traced, simulated, and freehand. In forgery, the writer does not write his natural way of writing and tries to imitate the characteristics of the original copy. Traced forgery is done by placing a carbon paper using a transmitted light. The forgery is said to be freehand when the person imitates through the photographic memory of the person who imitates the original copy. A simulated forgery is when a person tries to imitate the signature by seeing the original copy while forging. It requires repeated practice and this kind is harder to detect compared to other types. In this type of forgery, the tapered starts and ends will be seen along with changes in pen pressure and much less tremors in the moving line.

II. METHODS AND MATERIALS

Sample population

Samples were collected from 45 participants with each 10 samples total constitute 450 samples. The subjects were all forensic science students who were aware of how forgery is been done. They were well aware of the project carried out.

Collection of samples

The subjects were asked to practice the original copy before giving their samples. The samples were collected in the A4 sheets which have been parted

into 8 sheets with exact dimensions of 10.5*7.4 centimeters. The subjects were asked to imitate the original copy using the method of simulated forgery. The subjects forged the 10 samples in a single period without any interval.

Sample analysis

The samples were analyzed under the stereomicroscope to get a 3d view for better character analysis. It is used for stroke analysis and curved character analysis. Then the samples were compared with the standard sample for better results.

FIG 1: Figure showing standard signature

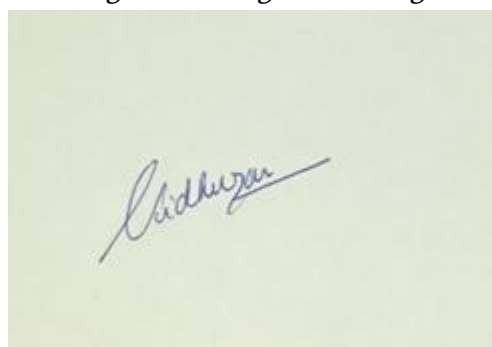
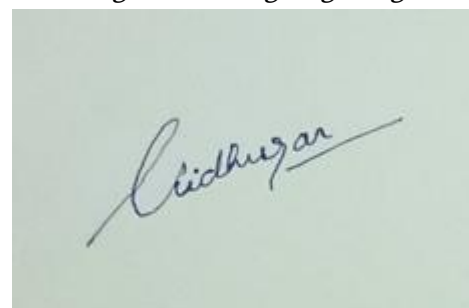


FIG 2: Figure showing forged signature



III.RESULT AND DISCUSSION

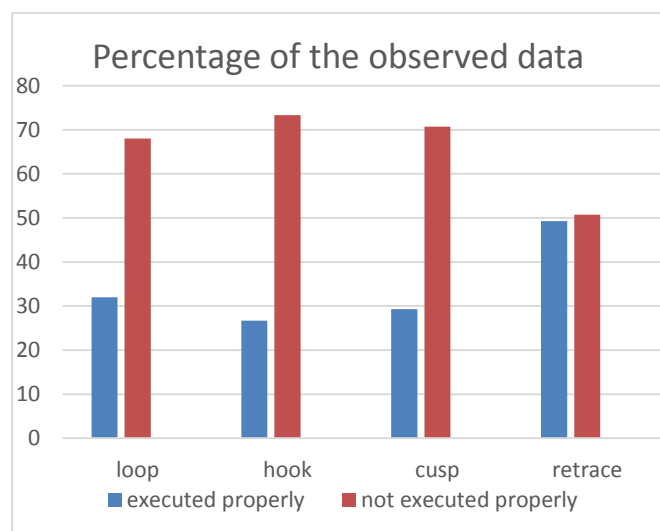
As this study deals with the execution of individual characteristics while doing forgery, the 4 characteristics such as loop, hook, cusp, and retrace were analyzed under the stereomicroscope, and the data were collected. The collected data is been tabulated below:

S.No	Character	Executed Properly	Not Executed Properly
1	Loop	144	306

S.No	Character	Executed Properly	Not Executed Properly
2	Hook	120	330
3	Cusp	132	318
4	Retrace	222	228

Table 1: Representing the observed data during the sample analysis

The graph showcases the percentage of the data observed from the samples during the analysis. The graph is made to showcase the percentage of the samples in which the characters are not properly executed in the forged sample. The visual representation is done for a better understanding of the data.



Graph1: Representing the percentage of the observed data of the samples

The graphical representation, clearly indicates that the subjects have found difficulty in executing the curved characters like hook, cusp, and loop whereas they have executed the retrace a little easily. It was clear that loop was executed correctly in 32% of the samples where the remaining 68% were not executed correctly, Hook was executed in 26.7% of samples where the remaining 73.3% samples were not executed properly, Cup was executed properly in 29.3% of the samples and remaining 70.7 was not executed properly, while in the case of Retrace 49.3% of

samples were executed correctly and remaining 50.7% of the samples were not properly executed. From this study the chronology order in which the rate of difficulty found by the subjects is given in the order of hook, cusp, loop and retrace. This study may help us to give preference to certain characters which can lead to less time consuming for analysis. In my opinion, it may also reduce the subjectivity nature hanging over questioned documents as facts may tend to reduce subjectivity.

IV.CONCLUSION

This study is conducted to identify the most flawed character while attempting forgery. This study is conducted by taking 4 individual characters into account which are loop, hook, cusp, and retrace. This study demonstrates that the curved strokes are difficult to execute whereas the straight strokes and retrace seem easy to execute compared to them. The majority of the curved characters were executed way differently than the original sample. The analysis is carried out as microscopic analysis using the stereomicroscope as the microscope gives a 3d view of the letter which is suitable for better character analysis. In the majority of the cases, this study can be applied to manage time by looking into easily traceable characters instead of these curved characters. This study implies that even though retracing as a type of individual character should also be considered, looking into curved characters makes the work easier for analysis.

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