A Preliminary Study To Determine The Source Of Writer In Two Different Scripts Kannada And Telugu

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Abstract:

Signature Analysis helps in identification of an individuals and is accepted under the court of law. Signature in India is found in various scripts based on this region. Kannada and Telugu are two prominent scripts of Southern India belonging to Karnataka, Telangana, and Andhra Pradesh. The current study aims at identifying the source of writer by comparing signatures made in Kannada and Telugu language. Handwriting characteristics are analysed and an opinion is framed based on the 50 Samples, Collected within the age group of 18-50 years. This approach provides an insight into the examination of multi-lingual scripts and helps in understanding the importance of scripts in Signature Analysis.

Keywords: Handwriting Analysis, Multi-lingual, Signature Analysis, Forensic Linguistics, Questioned signature

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Introduction

Handwriting and signatures play a pivotal role in establishing identity, confirming document attribution, and authenticating purpose. A signature, often described as a handwritten representation of an individual's name, holds significant value as evidence in forensic investigations. Handwriting, a complex neuromuscular skill, exhibits substantial variations among individuals, reflecting its uniqueness and authenticity **(Thakre and Kumawam, 2024)**. The uniqueness of signatures is emphasized by their individuality; even when the same person reproduces multiple signatures, subtle variations are consistently present. This variability is an inherent aspect of handwriting, which defines variation as the imprecision in the execution of a writer's habitual patterns. These variations manifest in various attributes such as speed, pressure, slope, and spacing.

The intrinsic variability of handwriting elements, including style, slant, alignment, and spacing, is essential for personalizing and identifying writing. Understanding these primary elements and their variations forms the foundation of accurate handwriting analysis. Moreover, the study of scripts, or the writing systems representing the alphabets of languages, is critical for forensic handwriting analysis. Each script is a symbolic representation of linguistic sounds and may exhibit distinct characteristics **(Pal and Rohatgi, 2023)** In India, a linguistically diverse country with 22 official languages, script analysis becomes particularly significant. The Brahmi script, one of the oldest known writing systems in ancient India, dates to the first millennium BCE. Modern Indian scripts such as Kannada, predominantly used in Karnataka, and Telugu, the official language of Andhra Pradesh and Telangana, have evolved from ancient systems like Brahmi and share unique linguistic features.

Kannada and Telugu scripts share commonalities, such as being written from left to right and favouring symmetrical shapes within squared outlines. At the same time, each script retains distinctive characteristics **(Sharma _et al._, 2019)**. These similarities and differences are vital in forensic examinations, particularly in differentiating handwriting characteristics and authenticating signatures. The study aims to identify class characteristics among these scripts, which is crucial for forensic document examiners in a multilingual and culturally rich country like India. By analysing and comparing scripts with shared origins, forensic experts can enhance the effectiveness of signature and handwriting analysis **(Kaurkanewal and Malhotra, 2017)**.

This research seeks to contribute to the growing field of forensic handwriting analysis by offering insights into script differentiation and their unique characteristics **(Kaur _et al._, 2017)**. The findings are intended to serve as a foundational resource for forensic document examiners, particularly in the context of India's linguistic diversity. Such understanding is instrumental in supporting informed conclusions about handwriting and signature authenticity, advancing the precision and reliability of forensic document analysis.

Materials and Methods

For this research, the 25 samples were collected from border of Karnataka and Andhra Pradesh. The region was particularly chosen to understand the importance of multilingual nature in India. An 80 GSM paper was cut into 8 pieces with the dimensions of length 10cm and width 7.5cm. Reynolds blue ball pen was used to collect the samples. The subjects were seated comfortably avoiding the mechanical factors affecting the signature. The subject was asked to sign in both Kannada and Telugu scripts. A total of 12 samples were collected for each script from each subject

Result

Table No. 1: The analysis of class characteristics of the samples

Sl. no	Characteristics according to ENFSI	Clearly similar	Similar	Clearly different	Different	Missing
1	Style and Legibility	44% of samples were observed to be clearly similar	48% of samples were observed to be similar		8% of samples were observed to be different	

2	General layout	84% of samples were observed to be clearly similar	12% of samples were observed to be similar		4% of samples were observed to be different	
3	Detailed layout feature	64% of samples were observed to be clearly similar	36% of samples were observed to be similar			
4	Detailed baseline	28% of samples were observed to be clearly similar	36% of samples were observed to be similar	36% of samples were observed to be clearly different		

5	Relative size and proportion	72% of samples were observed to be clearly similar	2% of samples were observed to be similar		8% of samples were observed to be different	
6	Relative spacing and slant	92% of samples were observed to be clearly similar	4% of samples were observed to be similar		4%of samples were observed to be different	
7	Detailed features	6% of samples were observed to be clearly similar			4% of samples were observed to be different	

Discussion

Style refers to the overall presentation of an individual and legibility refers to distinguish between letter from another in a particular space. When both were considered to know the variations among the samples collected. Among 25 samples, 23 samples were observed to be similar and 2 samples were different (figure no. 1).
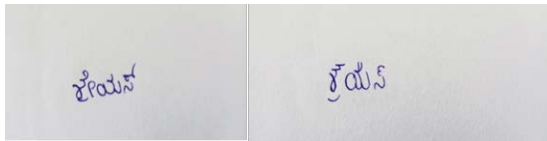
Figure No. 1

Figure No. 2

Detailed layout feature refers to the analysis of the consistency maintained in letters while during signature and speed of the writing was considered. Among 25 samples, all the samples were observed to be similar (figure no. 3).

Figure No. 3

Detailed baseline refers to the way of writing of the individual i.e the maintaining the line quality while writing or while doing signature. Among the 25 samples, it was observed that 16 samples were similar and 9 samples were different (figure no. 4).

Figure No. 4

Relative size and proportion refer to the size of the letters of an individual and the proportion is the maintaining the consistency of the same. Among the 25 samples it was observed that 23 samples were similar and 2 samples were different (figure no. 5).
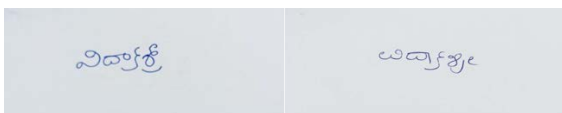

Figure No. 5

Relative spacing and slant refers to the spacing between letter to letter or word to word. Slant refers to the way of writing the letters or words. Among 25 samples it was observed that 24 samples were similar and 1 sample was different (figure no. 6).
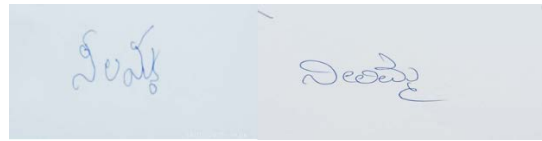

Figure No. 6

In detailed features it was considered that the pen pressure, speed, path length, fluency etc, were considered for analysis. During the analysis it was observed that 15 samples were similar and 10 samples were different (figure no. 7).

Figure No. 7

Conclusion

The sample collections and analysis ensure that the study addresses the challenges of multilingual handwritten signature recognition in Dravidian Scripts. The analysis and result of this study provides valuable insights into the relationship between multilingual and handwriting characteristics. The above results aids in understanding the difference in individual class characteristics. This analysis also helps in understanding the significance of the languages and the culture and the similarities between the words or letters.

Based on the result observed it can be concluded that multi-script examination is possible under Questioned Document, but it poses a challenge that the forensic document examiner should be familiar with a script to understand the pattern of writing, letter and stroke formation.

Acknowledgement

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