

A Preliminary Study on Kannada Handwriting Characteristics Amongst Karnataka Population

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Abstract:

Handwriting examination is one of the key types of evidence in solving both criminal and civil cases. India is known for its diverse languages with vast scripts across the country. One among the languages is Kannada which is mother language of the state Karnataka with 49 letters and 10 vowels. The study aims to determine the natural variations in Kannada writings by analysing the handwriting characteristics such as letter formations, spacing, pen pressure, slant, and rhythm. A total of 50 samples were collected within the age group of 18-25 from both male and female. A set of 3 writings were collected in different speeds to understand the factor affecting the handwriting. This study sheds light on fostering the differences and similarities in Kannada writings in determining the source of the writing. The study aims at bridging the gap in analysing handwriting by understanding the relationship between language and educational background of individuals.

Keywords: Handwriting, Linguistic, Kannada, Natural Variations, Handwriting Characteristics.

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Introduction

All the writings contain natural variations; hence no writer can exactly write alike in an extended handwriting sample. This principle of handwriting is one of the key understandings of the forensic document examiner in examining the disputed writings. This study aims at understanding the natural variations of a Dravidian script, Kannada, a prominent language in Karnataka, Southern India (**Ewell and Osborn, 1910**).

Kannada is a unity of southern Dravidian languages. It comprises of 49 letters and 10 vowels. It is a predominant language in Karnataka with Kodagu. This language identifies its origin from Kadamba script, an abugida of the Brahmi family. The numbers in Kannada language from 0-9 are represented using distinct glyphs differing it from Hindu Arabic numerals. These letters and numerals are used in daily life in Karnataka. Prabhu Kannada letters contain (ಒತ್ತಾಕ್ಷರ) adjacent letters for their dialects. These characters are mostly rounded letters and are devoid of connecting strokes.

The examination and comparison of an unknown script and producing an authorship opinion by the Forensic Document Examiner is debatable. Natural variations, formations of strokes, letter formations, master pattern variations of an unfamiliar script are difficult to be understood by the FDE and this cannot be denied (**Prabhu, 2025**). This paper aims at bridging this gap by shedding light in examining the natural variations of the Kannada scripts with the help of the general characters as stated by the ENFSI standards.

ENFSI general features include general layout, style and legibility, detailed layout features, detailed baseline, relative size and proportion, relative spacing and slant, detailed features, fluency and pressure.

1. Style and legibility – the readable appearance and angularity of the character is noted.
2. General layout – left margin of the writing is noted.
3. Detailed layout features – relationship between the size of the characters and the writing lines are observed.
4. Detailed baseline – positioning of lower characters in relation to adjacent characters.
5. Relative size and proportions – relative size of letters within words.

6. Relative spacing and slope – spacing between individual characters, within words and the variable slant of the writing.

7. Detailed features – pen path and character construction.

8. Fluency and pen pressure – skilful or poor production of the writing or any hesitation in pen line. Variable pen pressure of the writing is observed

Materials and Methods

A total of 50 samples were collected for the study. A purposive sampling technique was utilised for the collection of samples within the age group of 18-25. A blue ball point and 70 gsm A4 sheets were provided to the subjects to avoid any factors affecting the handwriting. The subjects were seated comfortably and the paragraph of the Kannada writing was dictated to the subject in three different **speeds (Gao and Wang, 2017)**. The first sample was collected by dictating the script in slow speed, the second was collected by dictating the script in medium speed and the last sample was collected by dictating the script fast. The samples were examined for the general features as stated in ENFSI standards.

Result

The examination of the samples revealed the importance of natural variations in handwriting and sheds light on the importance of familiarity of the language to understand the stroke formation, letter formations and master patterns of writing. Based on the examination it was found that relative spacing and slant are the features that portray highest natural variation when the speed of the writing increases.

ಭಾರತದ ದಕ್ಷಿಣ ಭಾಗದಲ್ಲಿರುವ ಕರ್ನಾಟಕ ರಾಜ್ಯದ ಸಂಸ್ಕೃತಿ, ಪ್ರಕೃತಿ ಮತ್ತು ಐತಿಹಾಸಿಕ ಪರಂಪರೆಯು ಕರ್ನಾಟಕವನ್ನು ವಿಭಿನ್ನ ರಾಜ್ಯವನ್ನಾಗಿ ಮಾಡುತ್ತದೆ. ಸ್ವಾತಂತ್ರ್ಯ ಪೂರ್ವದಲ್ಲಿ ಈ ರಾಜ್ಯದ ಹೆಸರು ಮೈಸೂರು ಎಂದಾಗಿತ್ತು. ಆದರೆ ರಾಜ್ಯವನ್ನು ಹೆಸರಿಸಿದ ನಂತರ, 1973 ರಲ್ಲಿ ಅದರ ಹೆಸರನ್ನು ಮೈಸೂರಿನಿಂದ ಕರ್ನಾಟಕ ಎಂದು ಮರು ನಾಮಕರಣ ಮಾಡಲಾಯಿತು. ಕರ್ನಾಟಕವು 1 ನವೆಂಬರ್ 1956 ರಂದು ಭಾರತದ ರಾಜ್ಯವಾಯಿತು. ಬೆಂಗಳೂರನ್ನು ರಾಜಧಾನಿ ಮಾಡಲಾಯಿತು. ಇಲ್ಲಿನ ಜಾನಪದ ನೃತ್ಯಗಳೆಂದರೆ 'ಯಕ್ಷಗಾನ' ಮತ್ತು 'ಡೊಳ್ಳು ಕುಣಿತ', ಇವುಗಳನ್ನು ಇಲ್ಲಿ ನಡೆಯುವ ಕಾರ್ಯಕ್ರಮಗಳಲ್ಲಿ ಅಥವಾ ಮದುವೆಗಳಲ್ಲಿ ಬಹಳ ಸಡಗರದಿಂದ ಪ್ರದರ್ಶಿಸಲಾಗುತ್ತದೆ.

Figure No. 1: Script used for dictating the samples

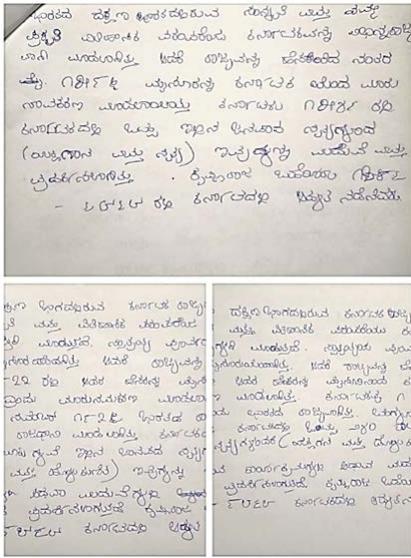


Figure No. 2: Representing the samples collected in three different speeds

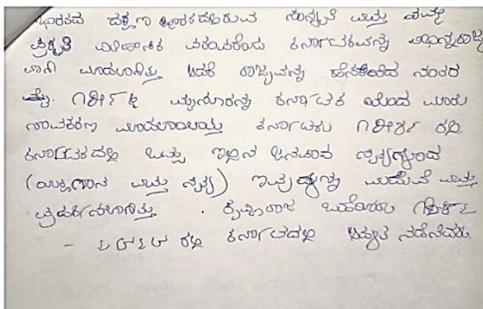


Figure No. 3: Increased relative spacing and slant between the words.

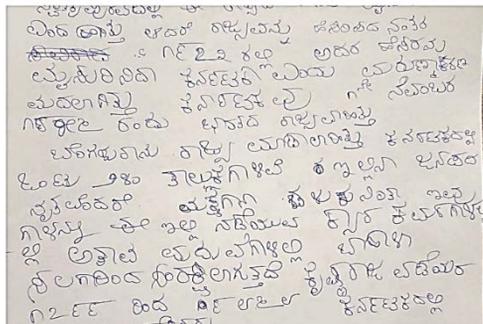


Figure No. 4: Increased relative spacing and poor pen path and character construction

Discussion

The samples were examined for the natural variations in Kannada scripts using the ENFSI general features.

The samples were compared within the sample set. It was observed that 90% of the samples were observed to be similar for style and legibility while 10% of the samples were observed to appear different. General layout of the samples was examined and was found that 90% of sample were similar while 10% of the samples appeared different. 90% of the samples appeared similar in detailed features examination while 10% samples were found to be different. The detailed baseline of 90% samples were observed to be similar and the 10% samples were observed to be different. The samples were examined for relative size and proportion and was observed that 90% of the samples appeared similar. Relative spacing and slant of the samples were observed and was found that only 20% of the samples were observed to be similar. The relative spacing of the samples was found to be increased within and among the words. 80% of the samples appeared different due to the increase in spacing. The pen path and the character construction of the samples appeared similar in 90% of the samples and only 10% appeared different. The samples were observed for fluency and pen pressures and found that 90% of the writings were fluent and variable pen pressure was persistent throughout the three speeds of writing while 10% of the samples appeared different. The most common feature to show a significant variation when the speed of writing increased was found to relative speed and slanting. Few samples projected variation in pen path and construction, when the speed of the writing increased. The natural variations in Kannada scripts within the samples were examined to understand the letter formation and character formation.

Conclusion

Based on the examination it can be concluded that the general features of writing are not affected largely though the speed of writing was increased. A difference in the relative spacing and the slant was observed in the increased speed writing. The difference was observed in pen path and character construction. A poor pen path and character construction was produced in the writings due to the increase of the speed. The examination indicates the importance of familiarity of the scripts in understanding the stroke formation, letter, and master pattern to determine the authorship of the writing (Kaur et al., 2017). The study sheds light on the dictation of samples to the subject in retrieving the natural variations in writing avoiding any chances of disguise. This study is a preliminary study and has further scope in examination of Dravidian languages.



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