A Preliminary Study of Examination and Comparison of Handwriting Characteristics of Hindi and Marathi Subject

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Abstract

When Comparing preliminary examination of handwriting of different medium, the method is used to compare the class characteristics. Handwriting is visible speech which express by writing with the help of writing instrument on the writing surface. The Present work focuses on investigating this assumption only by collecting the sample from the Marathi writers whose first language is Marathi and second Hindi. Handwriting is generally learned by watching another person write when you are young, but you latter develop your own style of writing, which latter express your personality. The objective of the study was to compare the handwriting of an individual in Hindi as well as Marathi. Samples ratio was equally divided i.e, 50 Samples from each category were collected and analysed.

Keywords: Class Characteristic; Hindi Handwriting; Marathi; Skills; Personality.

INTRODUCTION

The topic of questioned documents, or documents whose authenticity or source is questioned, is covered in the document. It mentions the contributions of Ordway Hilton, who is regarded as the father of handwriting examination, and Albert Osborn, who produced books in 1956 and 1910, respectively, on the scientific inspection of questioned documents and characteristics of handwriting that can be utilised for examination. The article also discusses William Harrison's study from 1996, which illustrates how handwriting analysis and questioned document scrutiny have advanced recently.[1,2]

The paragraph emphasizes how writing is a deliberate action that is frequently automatic and affected by ingrained patterns and subconscious factors. It says that conducting a handwriting examination involves comparing the questioned writing to samples of known writing, following particular procedures, like denying the subject get to the questioned document, and using a similar writing equipment. Analyzing, examining, and evaluating handwriting are all steps in the examination process.

Pen pressure, slant, skill, movement, alignment, rhythm, connecting strokes, line quality, proportion of letters and word spacing are only a few of the characteristics of good handwriting that are discussed. The document makes a distinction

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between individual and group handwriting characteristics. Individual characteristics are strong identifying tools that vary from the writing that has been taught. Dot formation, loop formation, staff, cross strokes, letter formation, and finish are a few examples of individual characteristics. On the other hand, class characteristics are shared by groups rather of being unique to individuals.[3]

An automated system for handwriting analysis was developed by Vikram Kamath and colleagues utilising image processing in MATLAB. To determine the writer's personality, they took eight unique characteristics from their handwriting. The technology might be used to identify cancer, Parkinson's disease, the authenticity of documents, and frauds. Shaista bin-ti-Nazir *et al.* examined 100 people's handwriting samples to determine their thoughts and moods using the SSGBSAT algorithm. The goal of the study was to identify the presence of seven different emotions in writing, including disdain, wrath, covert joy, grief, tears, and surprise. Aim objective of the study was to anticipate bad behaviour and offer early counselling.[4]

In a study on determining mental workload by handwriting analysis, G. Luria *et al.* using a device called a digitizer, participants generated three arithmetic progressions of varied difficulty. In order to evaluate low and high mental workload, differences in temporal, spatial, and angular spacing were found.[5]

The relationship between clinical diagnosis and graphological analysis in children's handwriting was examined by Mahesh Ramanina *et al.* They examined how personality characteristics appeared in handwriting using the Children's Personality Questionnaire. The study discovered no discernible differences between questionnaire-based psychodiagnostic evaluations and handwriting analysis.

The study was done to to compare the two scripts i.e. Marathi and Hindi by Preliminary Examination on the basis of variations in the size, slant, and spacing of characters, legibility and readability aspects of handwriting in both scripts, any unique or distinguishing features specific to Hindi and Marathi handwriting, influence of regional and cultural factors on the handwriting characteristics, consistency and uniformity of handwriting within each script and compare it across the two scripts.[6]

METHODOLOGY

In the vast majority of questions, a proper answer is quite likely if the norms of research are diligently observed and followed by the inquirer. The examples examined in this article serve as examples of how to examine and observe handwritten Hindi and Marathi script. For a comprehensive study, fifty samples were gathered from each category in both languages.

Several writers provided the handwritten examples. The fifty authors who were proficient in the aforementioned languages were chosen to provide examples in their native tongues for evaluation. They were instructed to rewrite a text written in Basic Hindi and Marathi language. Although the topic of this regular writing varied among languages, the writers in each language used the same format. In order to guarantee the authenticity, accuracy, and coherence of the report, care was taken to verify that the individuals whose handwriting samples were being gathered were proficient in the relevant language. After that, the collected samples were examined and evaluated utilizing the handwriting analysis.

RESULTS AND DISCUSSIONS

The following tables were used to identify the writing habits i.e. alignment (Ascending, Descending, Horizontal), Skills (Inferior, Medium, Superior), Speed (Slow, Medium, Fast), Slant
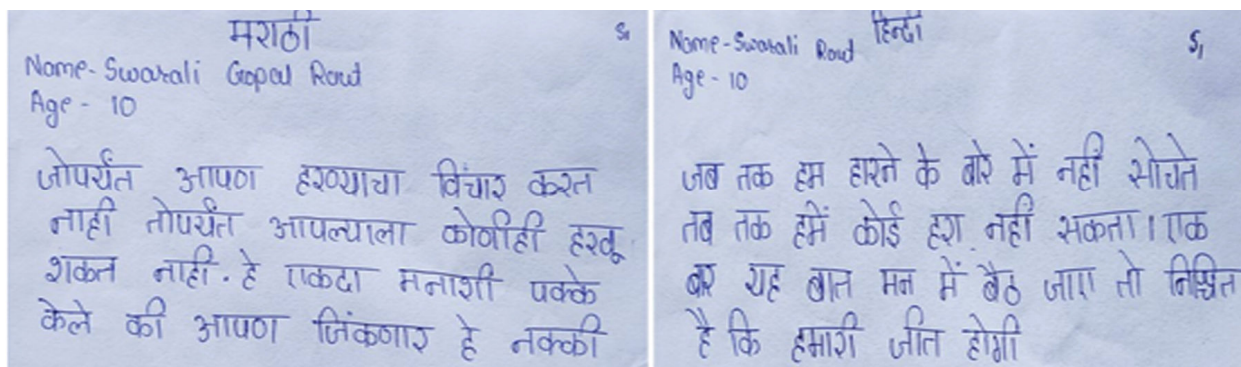

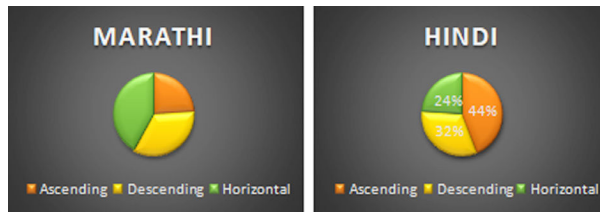**Fig. 1:** Reference Samples of Marathi and Hindi Scripts

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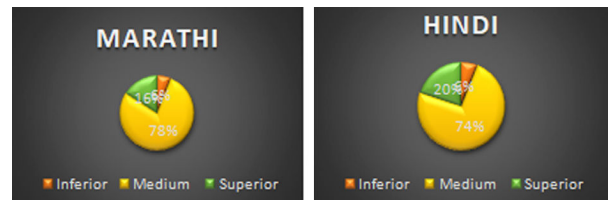**Fig. 2:** Alignment Marathi and Hindi

Fig. 3: Skill Marathi and Hindi
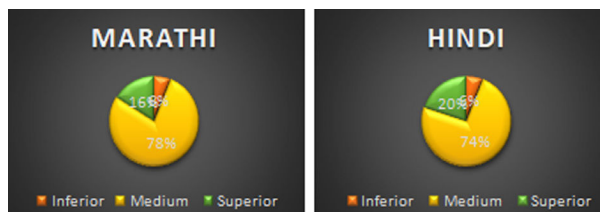

Fig. 4: Speed Marathi and Hindi
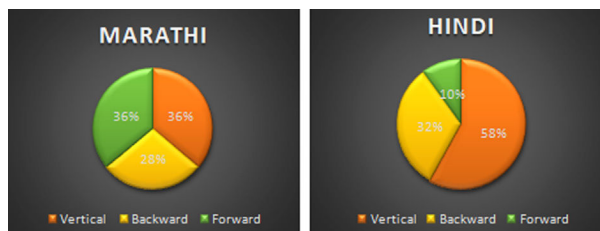

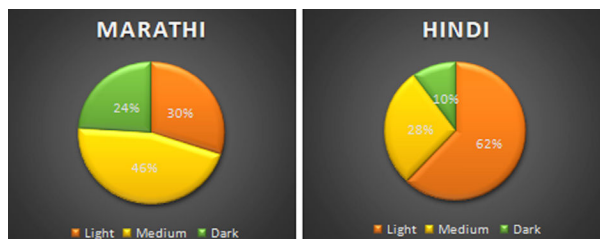**Fig. 5:** Slant Marathi and Hindi

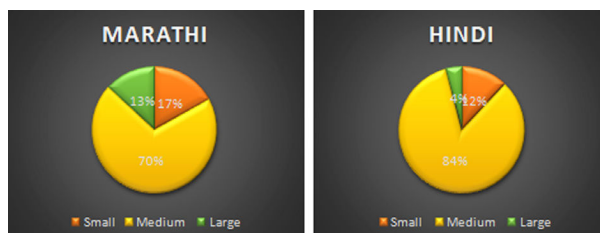
Fig. 6: Pen Pressure Marathi and Hindi
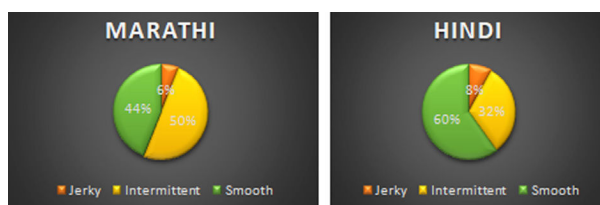

Fig. 7: Relative Size Marathi and Hindi

Fig. 8: Rhythm Marathi and Hindi

(Vertical, Backward, Forward), Pen pressure (Light, Medium, Dark), Relative Size (Small, Medium, Large), Rhythm (Jerky, Intermittent, Smooth), Spacing (Narrow, Medium, Wide), Movement (Fingers Combined With Wrist, Wrist Combined With Forearm), Proportion of Letter: Same, Different.

The study examined handwriting characteristics in Hindi and Marathi scripts using samples from 100 individuals (50 from each script). The analysis revealed that 24% of Marathi participants had ascending alignment, 34% had descending alignment, and 42% had horizontal alignment. In contrast, 44% of Hindi participants showed ascending alignment, 24% had horizontal alignment, and the remaining 32% had descending alignment. Regarding skills, 78% of Marathi participants demonstrated medium skills, while 6% had inferior skills and 16% had higher skills. Among Hindi participants, 20% exhibited higher skills, 6% had inferior skills, and 74% had medium skills.

In terms of pen pressure, 46% of Marathi participants applied medium pressure, 24% had heavy pen pressure, and 30% exerted light pen pressure. Among Hindi participants, 62% used light pen pressure, 10% applied heavy pen pressure, and 28% had medium pen pressure.

Regarding writing rhythm, 50% of Marathi participants had intermittent rhythm, 44% had smooth rhythm, and 6% exhibited jerky rhythm. Among Hindi participants, 60% showed smooth rhythm, 32% had intermittent rhythm, and 8% had jerky rhythm. Regarding slant, Marathi participants showed variations, with 36% having a vertical slant, 28% a backward slant, and 36% a forward slant. Among Hindi participants, 58% had a vertical slant, 32% a backward slant, and 10% a forward slant. Regarding speed, 80% of Marathi participants wrote at a medium speed, 14% were fast writers, and 6% were slow writers. Among Hindi participants, 82% wrote at a medium speed, 12% were fast writers, and 6% were slow writers. Lastly, the relative size of words differed. In Marathi, 70% of words were medium sized, 17% were small, and 13% were large. In Hindi, 84% of words were medium sized, 4% were large, and 12% were small.

CONCLUSION

The study examined handwriting characteristics in Hindi and Marathi scripts, focusing on class and individual traits. The findings indicate that Marathi individuals tend to exhibit more horizontal and descending alignment, while Hindi individuals lean towards ascending alignment. Marathi participants generally apply medium pen pressure, whereas Hindi participants exert light pen pressure. Marathi individuals commonly use vertical and forward slants, while Hindi individuals favor forward slants and to a lesser extent, backward slants. In terms of skills, both Marathi and Hindi individuals show a preference for medium handwriting abilities. Hindi individuals demonstrate a higher inclination towards smooth rhythm, while Marathi individuals tend to have an intermittent rhythm. The writing movement appears similar for both groups based on the sample analysis.

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