



DISCRIMINATION OF HAND WRITING BETWEEN BILINGUAL WRITER IN REGIONAL LANGUAGE AND ENGLISH

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Abstract - Handwriting plays an important role in personal identification and forensic document examination. The study of discrimination of handwriting between bilingual writers in regional language and English focuses on identifying the differences and similarities in writing patterns produced by the same individual in two different languages. Bilingual writers often use distinct writing styles, letter formations, spacing patterns, slant, pressure, and stroke movements depending on the language being written. These variations may occur due to differences in script structure, writing habits, educational background, and language familiarity. This research aims to analyze the characteristic features of handwriting in both English and a regional language to determine whether the writer maintains consistent individual traits across languages. The study also examines how natural variations influence handwriting identification and the challenges faced in forensic comparison when multiple scripts are involved. Samples collected from bilingual writers are carefully observed using parameters such as alignment, pen pressure, connecting strokes, speed, size of letters, and rhythm of writing. The findings of the study help in understanding the uniqueness of bilingual handwriting and its application in forensic science, criminal investigations, signature verification, and document authentication. The research concludes that although handwriting may vary between languages, certain individual characteristics remain consistent and can assist experts in identifying the writer accurately.

KEYWORDS: Bilingual Writer, Handwriting Analysis, Regional Language, English Handwriting, Forensic Document Examination, Handwriting Discrimination, Writer Identification, Script Comparison, Handwriting Characteristics, Document Authentication.

INTRODUCTION

Handwriting is considered a unique form of personal expression that reflects an individual's writing habits, motor skills, and linguistic background. In forensic science, handwriting examination is widely used for identifying writers and verifying documents. With the

increase in bilingual communication, many individuals commonly write in both English and their regional language. The handwriting characteristics shown in these two languages may differ because of variations in script structure, writing style, and familiarity with each language. The study of discrimination of handwriting between bilingual writers in regional language and English is important in forensic document examination. A bilingual writer may use different stroke patterns, spacing, slant, pressure, and letter formations while writing in different scripts. However, some natural writing habits remain consistent irrespective of language. By examining these similarities and differences, experts can better understand writer individuality and improve the accuracy of handwriting identification. This study focuses on comparing handwriting features of bilingual writers in English and a regional language to identify distinguishing characteristics and analyze their forensic significance.

STATEMENT OF THE PROBLEM

In forensic investigations, identifying the author of handwritten documents becomes difficult when the writer uses more than one language. Bilingual writers often show noticeable variations in handwriting while writing in English and regional languages due to differences in script style, educational influence, and writing practice. These variations may create confusion during document examination and writer identification. There is limited awareness and research regarding the consistent and variable handwriting characteristics of bilingual writers. Therefore, there is a need to study the discrimination of handwriting between regional language and English to understand whether the same writer maintains identifiable features across both languages. This study attempts to analyze these differences and determine their value in forensic handwriting examination.

OBJECTIVES OF THE STUDY

1. To study the handwriting characteristics of bilingual writers in English and a regional

language.

2. To identify similarities and differences in handwriting patterns between the two languages.
3. To examine the influence of script variation on writer identification.
4. To analyze individual handwriting traits such as slant, spacing, pressure, and letter formation.
5. To understand the forensic importance of bilingual handwriting examination in document analysis.

SCOPE OF THE STUDY

The scope of this study is limited to the examination and comparison of handwriting samples collected from bilingual writers who write in English and a regional language. The study focuses on analyzing observable handwriting features such as alignment, slant, spacing, pen pressure, speed, and stroke formation. This research is useful in the field of forensic document examination, especially in cases involving multilingual handwritten documents. The findings may help forensic experts, researchers, and investigators in improving writer identification methods and understanding natural handwriting variations among bilingual individuals. The study also contributes to academic research related to handwriting analysis and forensic science.

REVIEW OF LIERARURE

Handwriting examination has been an important area of study in forensic science for many years. Researchers have examined the uniqueness of handwriting and its role in personal identification and document verification. Various studies explain that handwriting is influenced by factors such as education, language, writing habits, psychological condition, and muscular coordination. These factors create individual characteristics that help experts distinguish one writer from another. Several researchers have focused on the identification of handwriting characteristics such as slant, alignment, spacing, pen pressure, size of letters, and connecting strokes. These features are considered significant in forensic document examination because they remain relatively stable even with natural variations in writing. Studies also show that no two individuals possess exactly identical handwriting patterns. Research on bilingual handwriting has gained attention due to the increasing use of multiple languages in daily communication. Bilingual writers often write in English as well as regional languages, which involve different scripts and writing structures. Earlier studies

observed that handwriting may change depending on the language used because each script requires different stroke movements and writing techniques. For example, English handwriting is alphabet-based, while many regional languages use complex curves and connected characters.

Some studies suggest that bilingual writers maintain certain consistent personal habits across languages, such as writing rhythm, pen pressure, spacing style, and movement patterns.

Other researchers found that differences in script formation and writing speed may lead to variations that create challenges during forensic comparison. These findings highlight the importance of studying bilingual handwriting separately from monolingual handwriting.

RESEARCH METHODOLOGY



Research methodology refers to the organized procedure used to conduct a study and achieve its objectives through systematic collection and examination of information. In this study, the methodology was designed to compare the handwriting characteristics of bilingual writers in English and a regional language. The research mainly focused on identifying individual writing patterns, similarities, and variations present in both scripts. A descriptive and comparative approach was adopted for the study. Handwriting samples were collected from bilingual individuals who regularly write in both English and a regional language. The participants were selected from different educational and social backgrounds to obtain a variety of handwriting styles.

Researchers in forensic document examination have also emphasized the role of comparative analysis in identifying writers. By examining both similarities and differences between handwriting samples, experts can determine the probability of common authorship.

Studies related to multilingual and bilingual handwriting contribute to improving the reliability of forensic analysis in criminal and civil investigations.

The existing literature indicates that although handwriting differs between English and regional languages, individual writing habits continue to appear in both scripts. Therefore,

further research on discrimination of handwriting between bilingual writers in regional language and English is necessary to strengthen forensic identification methods and reduce errors in document examination.

Research Design

The study is based on a descriptive and comparative research design. It aims to identify similarities and differences in handwriting patterns produced by bilingual writers in two different languages.

Sources of Data

The study mainly uses primary data collected directly from bilingual writers. Secondary data is also referred from books, journals, forensic science articles, and previous research studies related to handwriting examination and forensic document analysis.

Sample Selection

The handwriting samples are collected from a selected group of bilingual individuals who are capable of writing fluently in both English and a regional language. The participants belong to different age groups and educational backgrounds to ensure variation in handwriting patterns.

Data Collection Method

Data collection refers to the process of gathering handwriting samples required for the research study. In this research, primary data was collected directly from bilingual writers. The participants were asked to write the same content in English and in their regional language under similar writing conditions. To maintain uniformity, all writers used similar paper and writing instruments during sample collection. The handwriting samples were collected carefully to avoid external influences such as copying, tracing, or guided writing. Natural handwriting was encouraged so that original writing habits could be observed clearly.

Parameters Used for Analysis

The collected handwriting samples are examined based on the following characteristics:

1. Slant of writing
2. Alignment and baseline habits

3. Letter and word spacing
4. Pen pressure
5. Size and proportion of letters
6. Stroke formation and connecting patterns
7. Speed and rhythm of writing
8. Margins and overall arrangement

Method of Analysis

The handwriting samples are compared visually and analytically to identify both individual characteristics and natural variations. Similarities and dissimilarities between English handwriting and regional language handwriting are carefully observed to determine whether consistent personal traits are maintained across both scripts.

Tools and Techniques

Magnifying lenses, handwriting comparison charts, and forensic observation methods are used during the examination process. Standard forensic handwriting analysis techniques are applied for accurate comparison.

Ethical Considerations

The handwriting samples are collected with the consent of the participants. Personal information of the writers is kept confidential, and the collected data is used only for academic and research purposes.

DATA ANALYSIS AND INTERPRETATION



The collected handwriting samples of bilingual writers were carefully analyzed to identify similarities and differences between English handwriting and regional language handwriting.

The examination was carried out using various handwriting characteristics such as slant, spacing, alignment, pen pressure, size of letters, and stroke formation. The analysis helped in understanding whether the same writer maintained consistent writing habits across both languages.

Analysis of Slant

It was observed that most writers maintained a similar slant in both English and regional language writing. Some writers showed a rightward slant in both scripts, indicating consistent hand movement and writing habit. However, slight variations were noticed in a few samples due to differences in script structure.

Interpretation:

The consistency of slant in both languages suggests that slant is an individual characteristic that may remain stable irrespective of the language used.

Analysis of Spacing

Word spacing and letter spacing varied among writers. In English handwriting, spacing was generally more uniform, while in regional language writing, spacing appeared comparatively closer because of connected characters and script complexity.

Interpretation:

The variation in spacing was mainly influenced by the structural nature of the script used by the writer. However, personal habits related to text arrangement, paragraph flow, and writing balance continued to appear in both languages. This shows that spacing characteristics can still support writer comparison in bilingual handwriting examination.

Analysis of Pen Pressure

During the examination of handwriting samples, differences in writing pressure were noticed among bilingual writers. Some writers produced dark and deeply marked strokes in both English and regional language writing, while others used lighter pressure with smoother strokes. In a few samples, regional language writing showed slightly stronger pressure because the script required more continuous and curved movements.

Interpretation:

The variation in writing pressure reflects the natural hand control and writing behavior of each individual. Although minor changes may occur between scripts, many writers continue to show a recognizable pressure pattern in both languages, which can support handwriting comparison and writer examination.

Analysis of Letter Formation

The structure and formation of letters differed significantly between English and regional language scripts because both languages follow different writing systems. However, certain habits such as stroke direction, beginning and ending strokes, and writing rhythm remained similar.

Interpretation:

Even though script patterns change between languages, individual writing habits continue to appear in handwriting samples.

Analysis of Alignment and Baseline

The handwriting samples displayed different styles of alignment and baseline movement. Certain writers maintained straight and balanced writing in both English and regional language scripts, whereas others showed upward or uneven movement across the writing line. Similar alignment habits were visible in many samples despite the difference in script style.

Interpretation:

Baseline and alignment patterns represent the natural flow and coordination of handwriting. Even when bilingual writers use different scripts, their habitual writing movement often remains visible, making alignment an important factor in identifying similarities between handwriting samples.

Overall Interpretation

The overall analysis revealed that bilingual writers show both variations and similarities while writing in English and a regional language. Variations mainly occur because of script differences, writing practice, and language familiarity. At the same time, certain personal handwriting characteristics such as slant, pressure, rhythm, and stroke habits remain consistent across both languages. The findings indicate that bilingual handwriting examination can be useful in forensic document analysis and writer identification. Even when different scripts are used, individual handwriting characteristics help forensic experts determine the identity of the writer with greater accuracy.

FINDINGS OF THE STUDY

The study on discrimination of handwriting between bilingual writers in regional language and English revealed several important observations related to handwriting characteristics and writer identification.

1. Most bilingual writers showed certain consistent handwriting habits in both English and regional language writing.
2. Features such as slant, writing rhythm, pen pressure, and baseline alignment remained comparatively stable across both scripts.
3. Noticeable differences were identified in letter formation and spacing due to variations in script structure and writing style.
4. Regional language handwriting appeared more connected and curved when compared to English handwriting.
5. English handwriting generally showed clearer spacing and simpler stroke patterns than regional language writing.
6. Individual writing habits continued to appear even when writers switched from one language to another.

SUGGESTIONS

1. Further studies may be conducted using a larger number of bilingual handwriting samples for more detailed analysis.
2. Researchers can include different regional languages to understand script-based handwriting variations more effectively.
3. Forensic document examiners should focus on individual writing habits rather than only script differences during handwriting comparison.
4. Modern digital tools and handwriting analysis software may be used to improve the accuracy of bilingual handwriting examination.
5. Training programs related to multilingual handwriting analysis should be encouraged in forensic science education.
6. Future research may study the effect of age, education, writing speed, and emotional condition on bilingual handwriting patterns.
7. Standard guidelines may be developed for the examination of bilingual handwritten documents in forensic investigations.

CONCLUSION

The study on discrimination of handwriting between bilingual writers in regional language and English highlights the importance of handwriting examination in forensic document analysis. The research identified that bilingual writers display both similarities and variations while writing in different languages. Differences mainly occur because of script structure, writing style, and language familiarity, whereas certain personal handwriting habits remain consistent in both forms of writing. Characteristics such as slant, pen pressure, alignment, writing rhythm, and stroke movement were found to be useful in identifying common authorship. Although letter formation and spacing varied between English and regional language scripts, the individual writing style of the writer continued to appear in the handwriting samples. This proves that bilingual handwriting analysis can support accurate writer

identification when examined carefully. The study also emphasizes the value of comparative handwriting examination in forensic science. Understanding bilingual handwriting patterns can help forensic experts improve document verification methods and reduce errors during writer identification. Overall, the research confirms that personal handwriting characteristics remain an important factor even when a writer uses multiple languages.

LIMITATIONS OF THE STUDY

1. The study was limited to a small number of bilingual writers, which may not represent all handwriting patterns.
2. The research focused only on English and one regional language, so the findings may differ with other scripts and languages.
3. Handwriting samples were collected under controlled conditions, which may not fully reflect natural day-to-day writing variations.
4. Factors such as emotional condition, health issues, writing speed, and fatigue were not deeply analyzed in the study.
5. The research mainly relied on visual and comparative examination methods without advanced technological tools.
6. Variations caused by different writing materials and surfaces were not included in the analysis.
7. The study concentrated only on handwriting discrimination and not on signature analysis or disguised writing.

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