

Research Article

LINGUISTIC STUDIES OF MONGOLIAN TRADITIONAL SCRIPT: THEORY AND METHODOLOGY

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ABSTRACT

Mongolian traditional script (Mongol bichig) is regarded as one of the world's most distinguished literary traditions, carrying an intellectual heritage that spans several centuries. One of its oldest surviving examples is the Chinggis Khan stone inscription, dated to 1224–1225. Manuscripts and archival documents written in Mongolian script are held in libraries around the world, including in Russia, China, the United States, the United Kingdom, Japan, Germany, Sweden, Hungary, and France, and the majority of Mongolia's own archival holdings are recorded in this script; the National Library of Mongolia alone catalogues more than two million historical items written in Mongolian script. In recent years, the Government of Mongolia has pursued a public policy of reviving the national script, culminating in the 2015 Law on the Mongolian Language, which mandates that government organizations use a combination of Cyrillic and Mongolian script beginning in 2025. Against this backdrop, the forensic examination of Mongolian script has taken on renewed importance — not only for authenticating historically significant *sudurshastir* (canonical texts) written in Mongolian script, but also for identifying the author of an original text or manuscript. This paper examines the theoretical and methodological issues involved in the forensic examination of Mongolian script and, on that basis, proposes solutions to the problems identified.

Keywords: Mongolian traditional script; forensic examination; forensic identification.

INTRODUCTION: THE ALTAIC LANGUAGE FAMILY AND THE PLACE OF MONGOLIAN

According to historical records, the Altaic language family was first proposed by the Swedish linguist Philip Johan von Strahlenberg (1676–1747), who studied the dialects of the Ural, Siberian, and Caucasus regions and grouped the Turkic-Uyghur, Tatar-Samoyedic, Mongolic, Manchu-Tungusic, and Black Sea peoples' languages together under a shared origin, which he termed "Tatar." This was the first attempt to determine the origin of the Altaic languages.

The first scholar to examine the origins of the Altaic languages from a strictly linguistic standpoint was M. A. Castrén (1813–1852), who analyzed numerous Asian and European languages on the basis of fundamental features such as word structure, grammatical form, and other distinguishing characteristics.

Building on this comparative work, Finno-Ugric, Turkic, Mongolic, and Manchu-Tungusic came to be identified as related but independent language groups, collectively termed "Altaic." The Finnish scholar Gustaf John Ramstedt (1873–1950) further researched the Mongolic, Manchu, and Tungusic languages, providing evidence of shared phonetic systems, historical development, and similarities in word structure and vocabulary.

It was later established, on linguistic grounds, that these languages share a common ancestor within the Altaic family. According to Kotwicz's early theory of the relationship between Turkic, Mongolic, and Tungusic, these languages are not genetically related (homologous) but are formally similar as a result of prolonged contact.

The prominent British Turkologist Sir Gerard Clauson identified numerous parallels in the vocabulary of ancient texts and concluded that most of these similarities stem from close contact between Turkic and Mongol peoples prior to the twelfth century, when the two groups maintained close ties and their vocabularies became closely intertwined.

A. M. Shcherbak reached a similar conclusion, explaining these lexical similarities as the product of long-term language contact rather than common descent.

Furthermore, drawing on Krewson's research, Academician Ligeti noted that "when comparing commemorative vocabulary items across Turkic, Mongolic, and Manchu texts separated by centuries, it is not possible to conclude, from a linguistic standpoint, that these languages form a single unified family." Summarizing more than a century of scholarship on the Altaic languages, the family is generally understood to comprise the Turkic, Mongolic, Tungusic, and Manchu branches.

Since the first half of the twentieth century, a further trend has emerged toward including Korean and Japanese within the broader Altaic language family. Among the Altaic languages, Turkic is the most widespread and ethnically diverse branch, encompassing Turkish, Azerbaijani, Turkmen, Uzbek, Kazakh, Kyrgyz, Bashkir, Tatar, Altai, Tuvan, and Yakut, among others, spoken across a wide geographic range extending from the Caucasus and the Volga region to Central Asia, Siberia, and Xinjiang. The second-largest branch is Mongolic.

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Figure 1: Mongolian script



Figure 2: Manchu script

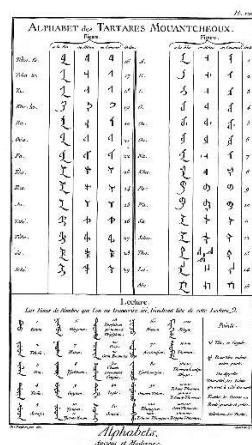


Figure 3: Old Turkic script

DISTINCTIVE FEATURES OF MONGOLIAN TRADITIONAL SCRIPT

Mongolian traditional script is one of the few writing systems in the world that is written vertically, from top to bottom, with successive columns running from left to right. This distinguishes it from most major world scripts: Latin, Cyrillic, and Sanskrit-derived scripts are written horizontally from left to right, while Arabic is written horizontally from right to left. Chinese and Japanese, by contrast, are non-alphabetic scripts that have traditionally been written vertically but can also be written horizontally.

Some scholars have further suggested that the top-to-bottom writing direction of Mongolian script parallels the physical principle by which a falling object requires no external force to move in its own direction, whereas motion along a horizontal axis requires the application of external force. On this reasoning, it has been argued that because the hand and brush move in the natural downward direction when writing Mongolian script, less muscular effort is required and the resulting strokes tend to flow smoothly, whereas horizontal writing is said to require comparatively more force from the hand and fingers.

It has also been suggested that Mongolian script's formation is linked to patterns of blood circulation in the body: when writing or reading horizontal text, the head is said to move from side to side, which some researchers argue slows blood flow to the brain and induces fatigue more quickly, whereas reading and writing Mongolian script, arranged top to bottom, involves an up-and-down movement of the head and neck said to reduce this effect. Similarly, it has been suggested that reading cursive horizontal scripts requires the eyes to move laterally between both sides of the page, which may cause greater eye fatigue than the predominantly vertical eye movement

involved in reading Mongolian script; by comparison, this difficulty is not typically reported for English. Building on this reasoning, it has further been proposed that the basic strokes of Mongolian script are drawn from left to right within each column, in a direction said to mirror the sun's daily path and to align with the body's natural circulation — thereby requiring less force, reducing hand and finger fatigue, and supporting healthy blood circulation while writing.

NATIONAL SCRIPT POLICY AND THE GROWING NEED FOR FORENSIC EXAMINATION

Mongolian characters have been in use for over a thousand years, and a great many historical, social, and literary documents have been created in Mongolian script; most of Mongolia's archival holdings are recorded in this script, and the National Library of Mongolia alone holds approximately two million volumes of Mongolian historical and classical works. In this context, the question of identifying the authors and scribes of these works is of considerable importance. The Government of Mongolia has pursued this goal through a series of national programs: "Mongolia National Plan I" (1995–2005), "Mongolian National Plan II" (2008–2015), and "Mongolian National Plan III" (from 2020).

On this basis, a policy plan was developed and approved to provide government services in a combination of Cyrillic and Mongolian script from 2025, with a planned transition to Mongolian script thereafter. In response to the growing demand for expertise in Mongolian script, the analysis of Mongolian characters is increasingly being incorporated into the field of criminalistics. It is therefore necessary to develop theories and methods that adequately define the role and importance of such analysis, and to continuously refine solutions based on the problems identified in practice.

Taking the above into account, this paper summarizes and presents research findings on determining the individual and general characteristics of Mongolian script for forensic purposes.

TYPES OF FORENSIC EXAMINATION OF MONGOLIAN SCRIPT

Writing is considered an important tool for the development and reinforcement of language. Ideas may be expressed in writing through two channels: written language proper, and drawing or pictorial (technical) language. Written language is a linguistic medium that reflects the content and ideas of a document; the visible product of written words is referred to as the hand-movement system, or writing style.

In literary analysis, the comprehensive study of complex symbols (e.g., characters) appearing in a manuscript makes it possible to identify the author on the basis of the written language and the interpretations drawn from the writing style, which develops through human thought and design. To identify the author or scribe of a manuscript, each scribe's own pictorial practices and inherited system of written language — itself a product of sustained practice — must be examined.

Forensic examination of Mongolian writings can be classified into the following three types.

1. Identification from source materials used to create characters.

The basic principle is to compare the characters and typographic features of documents and materials of unknown origin, authorship, or provenance with similar manuscripts considered possibly identical.

For example, to determine the original author of the historical work *The Secret History of the Mongols*, it is necessary to compare the characters and style against those of other historical documents of known authorship.

To identify a person from words and images, the characteristic practical features found in a person's writing are typically used first. Since authorship cannot always be determined from the writing or drawing alone, identification also requires the comparative analysis of the objects being examined.

2. Identification of general characteristics of common origin.

The various parts of any complex whole share a common origin that can be determined by their shared characteristics.¹ In other words, where materials of the same origin have, for whatever reason, been separated into parts, it is possible to reconstruct the regularities of the original whole; in forensic science this is considered a form of similarity analysis, which reconstructs the whole from its parts. With the help of specialized similarity-analysis methods and tools, it is therefore possible to determine the original text of a Mongolian document and its author. For example, when fragments of a will are recovered at a crime scene, or when physical evidence is seized from a victim's belongings, similarity analysis can be used to determine whether earlier acts had been committed against the same victim.

3. Identification through symbols in writing and painting.

If the manuscript under analysis has been destroyed or lost, identification can instead be based on the individual and general characteristics that identify the original text.

Mongolian character types are divided into three main categories: tatalgan (formal/monumental), guimel (rapid/cursive), and khicheengui (diligent/careful) script.

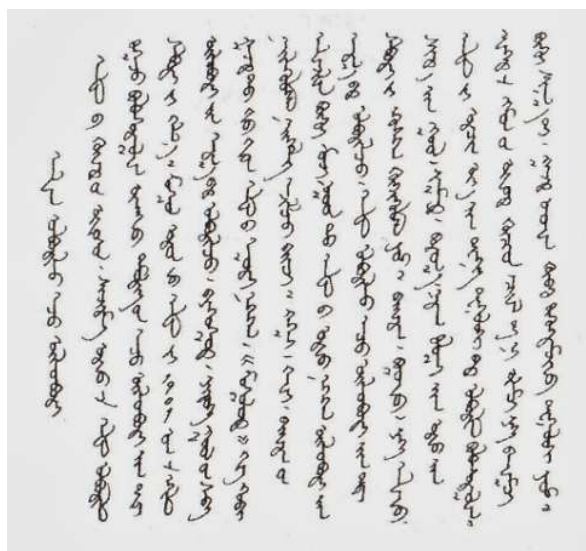


Figure 4: Tatalgan script

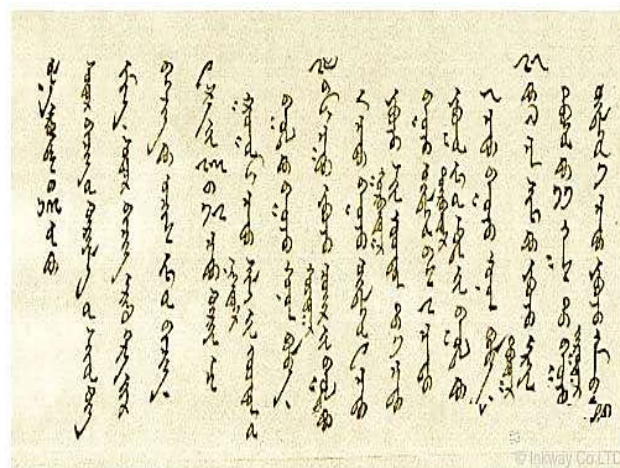


Figure 5: Guimel script

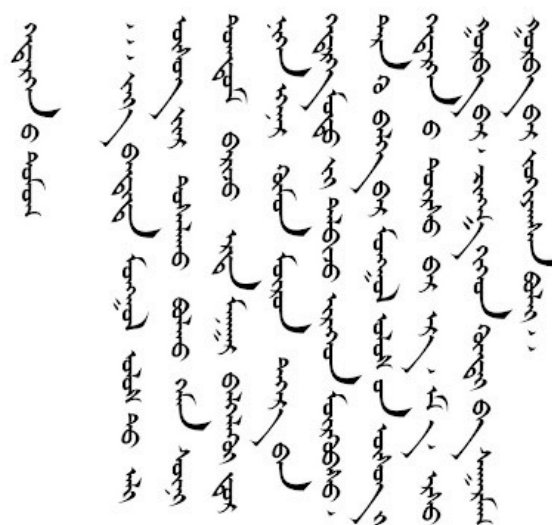


Figure 6: Khicheengui script

Determining group membership — i.e., which of these three categories a given sample belongs to — is typically the first step of examination. Classifying the type of Mongolian script in this way not only facilitates the expert's work but also narrows the search for the object and author, thereby saving time.

INDIVIDUAL AND GENERAL CHARACTERISTICS OF MONGOLIAN SCRIPT FOR FORENSIC IDENTIFICATION

Unlike Cyrillic, where the strokes and movements of each letter are relatively uniform, Mongolian script involves a mix of left- and right-hand turns and lacks a single uniform writing system, since shorthand writing tends to omit letters and simplify the drawing of certain characters. Different Mongolian scripts and their corresponding character forms therefore cannot be conflated or substituted for one another. Mongolian writing habits are individual, personal, distinctive, and relatively stable, and for that reason cannot be strictly standardized. They are characterized by features such as retracted strokes at the base of letters, the use of the vertical stem to indicate word length, and fluid hand movement that writes without lifting the pen or brush from the paper.² This is, however, a relative matter: during a retracted stroke, the pen may remain close to its normal

¹Bat-Erdene, B. *Studies in Forensic Medicine* (1st ed., p. 21). Ulaanbaatar, 2003.

²Battogtokh, D. *Wonders of Mongolian Script Writing* (p. 115). Ulaanbaatar, 2001.

position without fully lifting off the page. Although the resulting text remains clear and legible in such cases, careful writing tends to merge with the overall line and style of the passage. This occurs because one person's fixed writing habits have not yet been fully adopted by another, or the writing is at an intermediate stage of development. The level of a person's writing habits and skills reflects the effort invested in learning and mastering reading and writing; compared with newly acquired reading skills, established writing habits are relatively stable and operate at a higher level of automaticity. Indeed, the process of memorizing, reciting, and practicing Mongolian script requires sustained effort, which has a significant effect on the development of an individual's handwriting.

Above all, each profession tends to develop its own distinctive and stable style of writing; learning Mongolian script well requires serious study and regular practice in reading and writing. The basic strokes of a script carry particular importance for identification purposes, especially where a writer's distinctive flourishes and sketch-like elements create unique, individually recognizable images. In the past, when ordinary people petitioned senior government officials, the final line of the letter was sometimes intentionally reversed, serving as an external signal that the document conveyed a controversial or contested matter.

³Beyond identification, features of Mongolian manuscripts can also be used to trace specific individuals. Alongside Mongolian script, knowledge and use of Cyrillic has also been important for establishing the stability and distinctiveness of these symbols. For instance, Mongols in western China have traditionally written foreign words and Chinese loanwords using Mongolian script, whereas Mongols elsewhere have generally written foreign words using Cyrillic.

Graphology, accordingly, can be understood as the branch of knowledge concerned with the emergence, development, and evolution of writing style and language, together with the methods used for handwriting analysis and diagnostic examination.

On the basis of the foregoing, the individual and general characteristics of Mongolian script can be grouped and classified as follows.

Written language symbols. These demonstrate a writer's command of compositional practice, or reveal recurring errors.

Constituent symbols. The grammatical and lexical features of a given sample of Mongolian writing can indicate the author's age, gender, ethnicity, education level, occupation, place of residence, and, in some cases, medical condition. These features are therefore highly significant for formulating investigative hypotheses, identifying the author of a document, and establishing its provenance. In addition, the corpus of Mongolian writing extends beyond scientific articles, newspapers, and magazines to include official documents, literary works, short stories, letters, and other texts, and analysis may extend to the writer's evident purpose and psychological or emotional expression — content and information for a first phase of analysis, and identification for the next.

A sign of vocabulary proficiency. A writer with a rich vocabulary tends to show this clearly on the page. Indicators include reliance on clichés, a narrow or restricted vocabulary, the use of slang, the avoidance of terms considered obsolete in modern classical Mongolian, and the introduction of new terminology (for example, from technology or finance) associated with a particular profession. Attention should also be paid to personal or group-specific terms,

including business language, regional dialect, or other markers of social affiliation.

A sign of grammatical mastery. The grammatical characteristics of a text indicate the extent to which the author knows and applies the rules of spelling, grammar, sentence structure, and punctuation. Over time, the rules of grammatical writing have become more widely known, although variation persists in correct and simplified usage depending on native dialect, regional speech, and gaps in formal grammar instruction.

Adapting a language to a writing system requires the development of consistent rules, and the presence of many competing rules is itself an indicator of inconsistency in usage. In this connection, I. Dambajav developed teaching materials based on the spelling conventions of classical Mongolian script,⁴ comprising the following:

- Rules governing connected (ligated) letters;
- Rules of vowel harmony;
- The rule that conditional suffixes with repeating roots must be fully marked grammatically.

In writing Mongolian, a word-final consonant-or-vowel rule can be used to determine the correct suffix form: if a word ends in a vowel, the following suffix begins with a consonant, and if a word ends in a consonant, the following suffix begins with a vowel and is written as a direct continuation of the word. On the basis of such features, it is possible to draw inferences about a writer's educational background and level of education, as well as broader social, political, and professional characteristics.

Mongolian written language is several centuries old, and it can be concluded that the characteristics of the script are well suited to similarity analysis, since its spelling conventions, letterform transformations, composition, and established scribal traditions are closely aligned with a mature and well-established canon of the original text.

Mongolian characters — including individual letters, connected letters and writing conventions — possess their own distinctive properties. The concepts, terminology, and analytical approaches that Mongolian scientists and forensic investigators have developed for the analysis of Cyrillic script, together with its general and individual characteristics, cannot be applied directly to the similarity analysis of Mongolian script. Mongolian writing types are accordingly divided, independently of the Cyrillic classification, into six main styles: solid (block), flowing (fast), drawn, forced-drawing, cursive, and uran (ornamental) script; each is considered a normal, independent type of writing. The standard Mongolian Cyrillic classification does not correspond typologically to this Mongolian-script classification.

General characteristics of Mongolian traditional script. These are symbols that indicate the spatial positioning of the text — in effect, the author's compositional posture. For example:

Red line: in classical Mongolian script, a red line traditionally marked a new idea or a particularly respectful expression, in a manner distinct from present-day Cyrillic conventions; it is customarily placed in the upper corner of the page. For example, the name "Chinggis Khan" would traditionally be placed at the top of a line, set apart from the surrounding text, as a mark of respect.

³Newspaper Journal. Ulaanbaatar, no. 28, 2007.

⁴Dambajav, I. *Blue Mist of the Great Taiga* (pp. 253–259). Ulaanbaatar, 2013.

As for the positioning of lines, Mongolian script (unlike Cyrillic) is always written top to bottom rather than horizontally; the lines on the page are accordingly arranged vertically, and are sometimes highlighted in red for emphasis or rapid reference. This convention is not used consistently throughout a document. Although black lines are sometimes drawn on lower-quality or coarser paper, line spacing can vary slightly, and partial or interrupted lines of writing are comparatively rare.

In analyzing manuscripts held at the National Central Archives, we found that certain passages were written higher on the page than the surrounding lines. This feature was found to be most common in petitions submitted to princes and ministers.

In present-day Neo-Mongolian script, a space is conventionally left both above and below the red line, which can be explained as follows:

- The “red line” is set off above the top edge of the text;
- The “heel” marks are set off by grooves below the top edge; and
- Where neither feature is present, the passage can be classified as unstructured (non-paragraphed) text. The distinguishing features of Mongolian script further include:
 - markings of double strokes or lines at the top and bottom of letter stems (oblique, straight, rounded, dotted, or looped);
 - the running or stretching movement of the hand — that is, the spacing between the end of one column (the main stroke of a differentiating or generalizing element) and the beginning of the next word;
 - the connection of subsidiary strokes — flourishes written separately from the main word, and the elements connecting the corners and endings of letters such as “m” and “l”;
 - the compressibility and foldability of the script for ease of reading; and
 - differences in legibility between styles: characters in the pictorial (drawn) style tend to be denser and more difficult to read, whereas characters in the solid, flowing, and khicheengui styles are comparatively easy to read.

With respect to writing speed, it is not possible to classify Mongolian writing and drawing speed simply as fast, medium, or slow and conventional handwriting-speed indicators used for other scripts are not well suited to Mongolian. The main features that determine writing and drawing speed largely depend on the continuity of hand movement: the more letters and strokes produced without interruption, the faster the writing. A distinguishing feature of Mongolian script, relative to other writing systems, is that the pen is rarely lifted from the paper and hand movement remains continuous. For this reason, it is difficult to intentionally alter one's Mongolian handwriting style; where such changes do appear, they may result from a writer being newly literate in Mongolian script, from having long since lost the habit of writing it, or from certain physical changes in the body, such as illness or intoxication.

Stress-related pressure marks while writing are clearly visible in brush-written script, but in terms of kinematic connections, the general connection patterns used for Cyrillic script do not correspond to those of Mongolian script. Because Mongolian characters within a word are interconnected, the connections between them are not broken.

Mongolian personal writing style. A distinct concept applies here, and it is appropriate to distinguish between normal and exaggerated (embellished) forms. Since the concept of “simplified characters” does not exist as such in Mongolian script, any simplification observed

must instead be classified within the pictorial character types, which constitute an independent character category.

A further feature of Mongolian script is that highly skilled writers are able to render tails, dashes, corner strokes, and terminal letters in a markedly modern style, reflecting a high degree of personal character in the writer's hand — both in tail features and in overall design. For the purposes of identification, the principal elements of Mongolian script (terminal strokes and letterforms) can themselves be treated as independent identifying characteristics. Judging by the direction of movement, and with the exception of the letter used to form loanwords, Mongolian characters are generally written in a clockwise direction.

Continuity between letters (ligation). This refers to the shape of the letter stem, a fundamental characteristic of Mongolian script, which can be classified as round, straight, looped, or square.

The shared and individual characteristics of Mongolian writing and letterform patterns described above are considered relatively stable and, taken together, sufficiently distinctive to support the forensic similarity analysis of manuscripts written in Mongolian script.

CONCLUSIONS AND RECOMMENDATIONS

A comprehensive study of the features discussed above is necessary, and it may be concluded that such analysis is significant not only for linguistics but also for forensic science. In light of this, the following recommendations are proposed:

1. Develop and introduce the concepts and terminology of Mongolian-script forensic examination into Mongolian forensic science.
2. Develop theories and methods for applying the general and individual characteristics of Mongolian script to forensic identification and diagnostic examination, and identify practical means of implementing them.
3. Explore treating the Altaic root language of Mongolian script as a distinct branch of forensic linguistic examination, grounded in the specialized theories and methods of forensic science.

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