The Use of a Comparative Analysis of the Connection Between Ancient and Modern Chinese Languages in the Process of Teaching Students Chinese Characters

Aleksandr Egorov, Maia Egorova(✉), and Tatiana Orlova

Peoples' Friendship University of Russia (RUDN University), 6 Miklukho-Maklaya Street, Moscow 117198, Russian Federation

Mey1@list.ru

Abstract. The oldest monuments of the Chinese language are the inscriptions on the bones and tortoise shells, which were used for fortune telling, as well as inscriptions on bronze vessels. Previously, the original scientific basic work concerning some features of the archaic writing and syntax of the ancient Chinese language was made in comparison with the modern Chinese language that was made earlier. The main goal of the present paper is the usage of the obtained fundamental results of promising and relevant scientific research in the modern educational process. In this case, the following important aspects of the training process are: visibility (demonstration of the modification of hieroglyphs from pictograms, through ideograms to their modern form), connection of the theory with practice (demonstration of some theoretical assumptions implemented in the practice) and consolidation of the acquired skills (students use the acquired knowledge during practice or seminars). In this article we give the examples of the use of ancient hieroglyphs and vocabulary in the modern educational training process: in educational training courses, educational literature, in scientific works, in linguistic reference books, etc.

Keywords: Educational process · Students · Chinese · Hieroglyphic inscription · Jiaguwen · Jinwen · Chinese writing · Gadget applications

1 Introduction

In the course of the educational process, first-year students of a non-linguistic university who start to learn Chinese face a number of new problems. One of the reasons why difficulties arise is the fact that for almost two years the educational process in the 10–11 grades of senior high school was associated with a period of the spread of Covid-19 epidemic and quarantine measures with self-isolation and online learning. All this has led to the fact that over the past two years a new type of modern student who can hardly cope with an array of information and is not used to traditional paper-and-pencil formats learning has been already formed. In addition, today's students can be attributed to the Gen Z TikTokers, users of various online applications and gadget applications, who

has difficulties in accepting the old traditional ways of transmitting knowledge, such as educational texts, dialogues, large exercises, translation assignments, listening and other various traditional methods of teaching a foreign language.

For modern students, the format of short clips images (clips), presentations, short video (1–2 min), mandatory visualisation of any topics in the content of the lesson, frequent changes in activities during the lesson, educational games and the use of various online tasks and gadget applications are more understandable.

Considering these features, in the last two years we have increasingly used in our work those methods that are most suitable for this particular type of a student.

One of the main challenges for students is learning Chinese characters. In the past two years students haven't written characters and haven't read aloud enough due to a decrease in the number of classroom traditional (face-to-face (FtF)) classes and the transition to online classes, however, learning Chinese characters is impossible without regular writing and training their pronunciation.

In this regard, in the course of our work, we are paying an increasing attention to the use of applications for Smartphones, which allow memorising Chinese characters in a playful interactive form. An important feature of such applications is that they help memorise the radicals, the importance and necessity of which is not always clear to beginners. Moreover, in such apps, the history of the formation of Chinese characters from Jiaguwen to modern writing is displayed. They tell about how the characters were formed, what radicals they consist of and what meanings they acquired.

The Chinese language has more than three thousand years of history and is one of two branches of the Sino-Tibetan language family [1–11]. Initially, it was the language of the main ethnic group of China – the Han people (dominates the national composition of the PRC: more than 90% of the country's population). In its standard form, Chinese is the official language of the PRC and Taiwan, and one of the six official and working languages of the United Nations. The languages that are part of the Sino-Tibetan family are spoken in China, Taiwan, and the countries of Southeast Asia; in addition, certain dialects of the Chinese language are the main languages of communication of the Chinese ethnic diasporas around the world. The Chinese (Sinic) family consists of several Chinese languages, often referred to as dialects.

By the beginning of the XX century the Chinese language turned out to be widespread throughout China, with the exception of some northern and north-western regions, where the languages of the Altai group were spoken [2, 11]. However, by the beginning of the XXI century in the course of the implementation by the PRC government of a program for the dissemination of the official Chinese language Putonghua (Pǔtōnghuà/普通话) throughout China, the Chinese language is gradually being introduced into those areas where it was historically not widespread [1, 3, 5].

The modern Chinese language, Mandarin, was created artificially in the middle of the 20th century. It is based on the vocabulary and grammar of Mandarin Chinese and the Beijing dialect – for pronunciation, i.e. the phonetics and vocabulary of Mandarin are based on the pronunciation norm of the Beijing dialect, which belongs to the northern group of Chinese dialects. The Mandarin grammar corresponds to the norms enshrined in literary works in the modern Chinese language Baihua (Báihuà/白话), which are also

closest to the northern dialects and inherited with certain changes the writing that came from the ancient Chinese language [1–3, 5].

When studying the modern Chinese language, it is of undoubted interest to demonstrate its living connection with the ancient Chinese language, an obvious historical continuity, both in the writing of some hieroglyphs and in the grammar of the language. In our opinion, it is relevant to use these features by teachers in teaching to students of higher educational institutions the Chinese language.

2   Materials and Methods

In this article, we consider it quite legitimate to talk more about the writing of the Chinese language as the main link between the ancient Chinese, Middle Chinese and modern Chinese languages. Actually, in the development of the Chinese language, three periods are usually distinguished – Ancient Chinese, Middle Chinese, and modern. In the history of the oral language, the ancient Chinese period ends, most likely, around the 6th century AD, ancient Chinese language from the 5th century BC to the II century AD, it can be called classical, the language of earlier monuments – pre-classical, and the language of the III–VI centuries AD – late ancient Chinese [6].

Modern Western terminology uses the term "archaic Chinese" to refer to the language of the early and middle Zhou period (11th century – 221 BC), as it is reconstructed from rhymes in the Shi Jing (Book of Odes) (c. 800–600 BC), the phonetic sequence revealed by the Chinese script, and information available from Middle Chinese (6th and early 12th centuries AD) [5]. Recently, in historical phonology, the term "ancient Chinese" has replaced the term "archaic Chinese" [5, 11]. According to the periodization established by Peyraube (Peyraube 1988), "pre-archaic Chinese" refers to the language of the Shang bone inscriptions (14th–11th centuries BC), which predates Old Chinese and Middle Chinese [9]. We emphasize that the Chinese language is thus a language whose syntax can be reconstructed at an earlier stage than its phonology.

The central place in the history of the ancient Chinese language, both chronologically and in its meaning, is occupied by the period of the 5th–2nd centuries BC. It was during this period that the most important monuments of ancient Chinese philosophical and artistic thought were created. The oldest monuments of the Chinese language are the inscriptions on bones and turtle shells (Jiaguwen/甲骨文 jiǎgǔwén, XIV–XI centuries BC), which were used for fortune telling (XIII–XI centuries BC), as well as on bronze vessels (Jinwen/金文 jīnwén) (the earliest of them date back to the end of the 2nd millennium BC), although Sinologists have certain doubts about these dates [6]. The language of these texts is usually called "archaic".

The archaic ancient Chinese language is most fully represented in the fortune-telling inscriptions of the period of King Wu Ding (武丁 Wǔ Dīng) reign: they are distinguished by the greatest completeness and numerous series (the fortune-telling inscriptions were serial, i.e. a series of questions of the fortuneteller, different in form, but the same in content). One of the main features of the inscriptions of King Wu Ding period was that they lack a special question form (a question to any of the members of the sentence) through interrogative words expressed by pronouns and adverbs [6].

Another feature of the archaic ancient Chinese language is that some functional words are found only in a certain group of monuments, or the same functional words are used

differently in different works. On this basis, at least two dialects can be distinguished. It should be noted that in the III century BC dialectal differences between individual sites almost disappear. All texts of this time contain, in general, the same functional words [6].

Visually, fortune-telling inscriptions differ from other types of inscriptions (marks on bones and shells for their inventory; records of accidental incidents that took place during fortune-telling) in that special cracks were made on them with a hot rod: vertical and lateral, and by their nature they recognized the answer of the Supreme deities. The question was asked by a fortune-teller, fixing it several times in various forms next to the corresponding crack, the answer of the deity was read by the ruler (king) and he himself determined the result of the fortune-telling [4–6].

The history of the grammar of the ancient Chinese language is presented as a process of its gradual complication. The archaic ancient Chinese language is distinguished by a very limited set of official words (mainly, this is the preposition 于 yú 'in, on'), grammatical constructions and models of verb control, which is partly explained by the standard form of fortune-telling inscriptions (meaningfully, the inscriptions consist of two parts: the question of the fortuneteller/reason for fortune-telling is the result of fortune-telling) and the situation. The inscriptions on bronze, although connected predominantly with the same donation situation, are already more voluminous texts, including information about who, when, to whom and in connection with what presented this bronze vessel. The main set of grammatical means of expression appeared only in the early classical and classical periods. In subsequent eras, the ancient Chinese language was constantly enriched with lexical and grammatical borrowings from colloquial dialects and Baihua.

In Chinese, grammatical relations between words in a sentence are expressed by the order of their arrangement, as well as by special function words (functors), for example, prepositions, but not by changing the form of words. In the ancient Chinese language, as in the modern Chinese language, there are no forms of declension and conjugation [6]. Old Chinese does not know agglutinative inflectional affixes, such as those that in modern Chinese form the temporal forms of the verb; the tense and voice of the verb in Old Chinese are also expressed in official words. Only in the field of word formation do we find in it quite a lot of elements of inflection (and also, perhaps, agglutination). The languages in which grammatical relations between words are expressed using word order or function words (functors) are called either isolating or analytical in the typological classification (these two terms – "isolating" and "analytical" – give exactly the same definition, but the first is used only in relation to the languages of Asia and Africa, the second – mainly to European languages). So, the Chinese language is analytical or, what is the same, isolating. Many other languages of the Far East belong to the same linguistic type, for example, Tibetan, Thai (Siamese), Vietnamese, Khmer [1–6].

An important distinctive feature of the ancient Chinese language is its syllabic character – all the roots of this language are monosyllabic. Monosyllabic is also characteristic of all analytical languages of the Far East. Another feature of the ancient Chinese language is the presence of musical tones. Unlike modern Chinese (as well as Tai and Vietnamese), the root in ancient Chinese was not completely unchangeable – alternations of sounds inside the root were possible, i.e. internal inflection [6].

The Chinese language uses ideographic writing; the signs of the Chinese writing are called hieroglyphs or Chinese characters. In ideographic writing, in contrast to phonetic, each sign corresponds not to a sound unit – a sound or syllable, but to a significant unit – i.e. a word or morphemes, which are written as a single whole, and are not divided into their constituent sounds. Different words are spelled differently, even if they sound the same. It follows from this that the same word was spelled in the same way throughout the history of the Chinese language, no matter how its pronunciation had changed.

The Chinese writing does not give us any direct evidence of phonetic changes occurring in the language, or information about phonetic differences between Chinese dialects; and vice versa: the text written in hieroglyphs can be read aloud in any of the modern Chinese dialects, as well as in Japanese, Korean, Vietnamese – in any language in which the Chinese script was used. Nowadays, no one reads ancient Chinese texts with an ancient pronunciation (we do not even fully know it). Every Chinese person reads these texts, pronouncing the words as they sound in his native dialect at present, or using the common Mandarin pronunciation. Phonetically, each hieroglyph corresponds to a syllable. Morphologically indecomposable two-syllable words, which, however, are few in ancient Chinese, are written in two hieroglyphs.

The first classification of Chinese written signs (characters or hieroglyphs), first detailed in the Shuowen dictionary (Shuōwén jiězì/说文解字 (说文)), is still the most widespread. According to this classification, all signs are divided into simple and complex. Compound signs consist of two or more simple ones, but they only have meaning when taken as a whole. A complex hieroglyph cannot be read in its component parts as in European languages we spell a word. There are several hundred simple signs and they are divided into figurative and indicative.

Complex signs are also divided into two categories: the first is ideograms (in the narrow sense of the word; in the broadest sense, any Chinese character is called an ideogram), which are combinations of two or more simple signs, in meaning to one degree or another related to the meaning of the sign as a whole; the second category, which is the most numerous one, is the so-called phonetic hieroglyphs, or phonograms. Hieroglyphs of this category consist of two parts, one of which (phonetic sign or phonetic part) indicates an approximate reading of the hieroglyph as a whole, and the other (radical) – to the semantic category to which the meaning of the word denoted by the hieroglyph belongs.

As it was mentioned above, the external form of Chinese characters in the 3rd century BC and later underwent strong changes, caused mainly by a change in the writing technique [1–5]. Kaishu is an exemplary or statutory letter (kǎishū/楷书) appears around the 1st century AD and is the style of writing that has survived to the present day. It differs from the previous ones in that all signs in this style are built from a small number of the same basic graphic elements (horizontal line, vertical bar, hook, point, etc.), which have completely lost any resemblance to drawings, from which they were derived.

The oldest Chinese texts and samples of Chinese writing, dating back to the XIV–XI centuries BC, i.e. by the second half of the Shang era, – Jiaguwen (Jiǎgǔwén/甲骨文, – "bone-and-shell script") – pictographic script on fortune-telling bones, fixing the results of fortune-telling [1–8]. The structure of the inscriptions practically did not undergo changes throughout all periods – they included the date, the name of the fortuneteller,

the question, the answer and the mark of execution, but the calligraphic style underwent a significant change – from large, rough hieroglyphs of the early period to the smallest, barely distinguishable by the eye (Western Zhou era). The number of different scripts on shells and bones is about five thousand characters, of which about 1.5 thousand are identified with modern characters [4–7]. We believe that at the initial stage of the formation of the archaic ancient Chinese language, it was the inscriptions on various objects that played an important role in this process [1].

Earlier, we came to the conclusion that the estimation of the number of different symbols of archaic writing in about 500–2000 characters (radicals/bùshǒu/部首) is quite justified [3–8]. Note that the most common system is with the reference number of main features and radicals of Chinese characters from 214 standard radicals.

The Smartphone application "甲骨文字" allows typing any radical, after which the ancient image of the radical (pictogram), the description of the subject, which gives the dictionary "说文解字" ("说文"), as well as the appearance of the image in the Jinwen period "金文" followed by Xiaozhuan style "小篆" display.

Another useful application that we frequently use in iPhone is "资源". By the name of the application it is clear that it allows studying the origin of Chinese characters. It is the paid applications; however, it helps to learn a lot of information about modern Chinese characters (see also [12, 13]). After typing any character in the search box the application shows its Pinyin, tone and the evolution of writing from Jiaguwen to Jinwen, to Xiaozhuan, then Kanshu, Lishu, Kaishu and modern simplified spelling with the eras and centuries, when each style was formed. For those Chinese characters whose writing in ancient times in Jiaguwen was absent, those stages of styles that are known are given. Below is a description of the history of the formation of the sign, and lower there are the translation options for the character. The application allows downloading all the information for each character to Smartphone or sharing it.

3   Results

In modern literature, there are practically no publications that analyze the continuity of the writing of characters from ancient times to the present day and at the same time pose the problem of assessing the number of corresponding basic "symbols" (characters and radicals) (see, for example, [4–7], especially with the involvement of methods of mathematical linguistics and computer modeling [5]).

In the paper [3] we analyse the tendency, which originates in antiquity and develops with varying intensity depending on historical epochs, towards the transition from oral linguistic diversity to a single unified norm, which resulted in the creation in the middle of the 20th century the Chinese national language Putonghua. A comparison of some typical hieroglyphs and keys (Chinese radicals) from modern common text messages with characters and radicals in the images of some Jiaguwen (Jiǎgǔwén/甲骨文 – writing on turtle shells and oracle bones dating back to the 14th–11th centuries BC) and Jinwen (金文 – ancient inscriptions on bronze vessels, about II–I millennium BC) was made.

Analysis of archaic written signs and texts shows that not only the written signs themselves (radicals/bùshǒu/部首) and characters, but also the whole sentence structure of the archaic sentence has much in common with the sentence structure of the modern

Chinese language. In archaic ancient Chinese, the predicate is always expressed by a predicative denoting an action or state, that is, based on linguistic typology, it is a sentence structure in which the subject comes first, the verb comes second, and the object comes third (subject – verb – object). Simultaneously, the grammatical category of time in archaic and modern Chinese may not be expressed in a special way; the same significant word in a predicative function can denote an action that took place in the past, is taking place in the present, or is expected in the future.

On the whole, our results allow us to speak about the prospects of studying of such ancient examples of art, culture and science as Jiaguwen and Jinwen. In this case, we are talking not only about visual research and the subsequent interpretation of Chinese inscriptions fixing the results of fortune-telling or predictions, for example, from the point of view of their content, but also about the development of methodological foundations for the selection of certain quantitative criteria that will be a good addition to the classical research method of such ancient artifacts, which will allow, to a certain extent, to formalizing the procedures for solving the problem formulated at the beginning of this section.

Based on the analysis of the ancient Chinese written signs and the grammatical construction of the sentence, we see the continuity of the ancient "archaic" and modern Chinese languages, which incorporated many elements of writing and the basic structure of the sentence, modified the elements taken, but retained their primordiality and authenticity [3–11].

Ancient written signs (radicals, characters) are mostly found with some degree of frequency in modern Chinese, however, characters (radicals) associated with the ancient Chinese tradition of divination and predictions, that is, those signs that are most often found on shells, bones of animals, bronze vessels and other ancient artifacts, primarily used to record the results of fortune-telling and predictions, are less common. However, even being rarely used in their direct meaning, such signs are not uncommon, since most characters, in addition to their primary meaning and, accordingly, use in speech, can be used as names, surnames, topographic names, etc. Thus, we can observe the variability in the use of ancient Chinese written signs (radicals, characters) in modern language.

For first-year university students, the text describing the evolution of the Chinese characters which is given in some applications is too complicated; however, for example in "资源" application drawings showing the change in spelling are highlighted in darker color, by analysing them students learn to recognise ancient images of various radicals. Analysis of such drawings can be done both independently and with the help of a teacher. Moreover, we noticed that it is interesting for students to try to guess the meaning of the picture, as well as to discuss with classmates and the teacher why during the evolution of the particular character it absorbed one or the other radical or lost some at the same time. Students get excited, as when guessing puzzles and riddles. To consolidate recognition at the end of the semester, it can be conducted a quiz on the origin of the characters, their appearance in antiquity and the history of their writing.

As a self-test, preparation for various key tasks, quizzes, and just to deepen students' knowledge of character folding, we use the application "甲骨文问答Lite" (see also [12, 13]). This application combines learning and a game in which the main task is to choose from the four proposed options for the modern writing of radicals and characters, the

one that was depicted as a sign on the Jiaguwen turtle shell. The element of the game is that you need to guess or recognise the character rather quickly, because it is a timed quiz. If the Jiaguwen radical had different spellings, the application not only shows the correct variant, but also the variant of this radical's spelling in Jiaguwen, highlighting the one that was in the task. Before starting the game, it is better to go through the 字書 section and practice memorising the radicals and their ancient images. This application allows not only developing and consolidating knowledge of the radicals and their ancient images, but also perfectly trains memory and attention to detail - the skills which are necessary for learning Chinese writing. Moreover, according to our observations, after using the application, students begin to pay more attention not to words and not even to the characters themselves, but to their constituent elements. They develop the skill of guessing the meaning of the word and characters with the help of the radicals; they better understand the etymology of the origin of modern characters. It is noteworthy that students are leaving the utilitarian approach to learning the language and a desire is formed to learn the deeper layers of writing, including the traditional writing of characters. They stop being afraid to come across new words and unfamiliar characters, try to unravel their reading and meaning by radicals, and better remember the spelling.

To consolidate the speed of reaction in recognising the radicals, the game application "古文字猜猜樂 (Etymology)" is suitable, which is a quiz to choose from four options for Jiaguwen images of the one that is proposed to be guessed in modern spelling. It is a timed game, which requires students to be automatic and familiar with the radicals and their ancient image.

The application "甲骨文信息" gives an understanding of the practicality of studying the radicals and a sense of their significance for the writing of ancient people. It allows typing a text message, both with the ancient images themselves and with modern characters. Those of them that appeared in ancient writings are transcribed into Jiaguwen in the appendix, and those that were not yet formed at that time are left in their modern form. This helps students understand and remember which characters appeared during the period of writing on turtle shells and stones, and which appeared later. The application gives an understanding of the significance of the character as a compressed carrier of written information and actually leads students to understand how the character brings us closer to SMS messages and the transfer of information through emoji.

4   Conclusion

This article provides information about the Chinese language, and also shows the main stages in the history of its formation from antiquity to the present day. The tendency, which originates in antiquity and develops with varying intensity depending on historical epochs, to the transition from oral linguistic diversity to a single unified norm, which resulted in the creation in the middle of the 20th century the national language Mandarin (Pǔtōnghuà/普通话), is briefly analyzed.

The history of Chinese writing dates back to the XIV–XI centuries BC, when a sharp cutter served as a writing tool, and inscriptions in the form of pictograms and ideograms were made on materials such as tortoise shells, bones of large animals, bronze vessels and other ancient artifacts.

Archaic inscriptions, primarily of the Shang-Yin era of the XIV–XI centuries BC, which are the earliest that was read, have not disappeared, but still exist, have organically merged into modern writing in the form of "radicals" (a component of more complex character) or in its own form (as a simpler character).

The departure from pictograms to the modern schematic form of characters has certainly complicated or made it impossible to understand them, but a look at their original image often helps not only to understand their origin, but also to draw a parallel with what form they have acquired by modern times. In addition, many grammatical elements of the Chinese language (for example, 不, 之, 于 and others), like its syntax, emerge even in archaic Chinese, for example, adverb and negation are placed after the subject before the verb, followed by the object.

The close connection between ancient pictograms and modern characters makes it necessary for the first-year students to get closer acquaintance with the origin of Chinese characters. It is especially helpful for the students of non-linguistic universities, as there are fewer hours of Chinese classes, so much work have to be done outside of class and students do not have much time for studying writing. Special applications for gadgets help them to get more information about characters during out-of-class study in a comfortable way.

Educational tasks in such applications are largely solved due to spending time "on the phone" that is important for modern youth and may include a competitive moment: students compete with each other trying to score more points, or complete a task in less time or with fewer attempts.

When illustrating similar things on a blackboard or showing students the same information in a textbook, their attention is not actually focused on the topic, and having a Smartphone screen in front of their eyes turns learning into a game. In addition, applications, unlike a textbook or paper materials, can be used anywhere, it is convenient, fast and corresponds to the psyche and inclinations of modern students.

Another important advantage is that all these applications are developed by native Chinese speakers; they are completely in Chinese and teach Russian-speaking students to rely only on Chinese, which is in fact equivalent to using Chinese-Chinese dictionaries or switching the Smartphone system to the China region.

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