Region-Educational Research and Reviews, 2024,Volume 6, Issue 6
DOI:10.12238/rerr.v6i6.2233
ISSN Online:2661-4634
ISSN Print:2661-4626

A Study on the Teaching of Chinese Characters Memorization for Foreigners based on the Memory Principle of Cognitive Psychology

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Abstract: Chinese characters have always been regarded as "Heavenly script" for students whose mother tongue uses a phonemic script. There are two main reasons: (1) The relationship among form, sound and meaning in Chinese characters is different from that in phonemic scripts; (2) There is a lack of effective methods regarding the teaching of Chinese character recognition and memorization, which is in accordance with the characteristics of this writing and the universal laws of human memory. This paper proposes a teaching method for Chinese characters memorization based on "Event Domain Cognitive Model" theory. Starting from the relationship of form, sound and meaning in Chinese characters, and combining with the universal memory principle explained by "cognitive psychology". It takes the component of modern Chinese characters as the memory unit, the event semantic logic between components as formation motivation of an integral character, the "Event Domain Cognitive Model" as the connection logic of characters family.

Keywords: Chinese character teaching, Chinese character cognition, Chinese character nature, component, character family.

Introduction

"Chinese characters are hard to learn" has always been a problem for Chinese teaching as a foreign language. Lu (2013) has argued that "almost 70–80 percent of learners stop studying Chinese after mastering Pinyin due to the difficulty of the characters."[1]

Chinese characters are extremely complex and have been regarded as the "heavenly script". There are two main reasons:

1. The relationship among form, sound and meaning in Chinese characters is different from that in phonemic scripts.

2. There is a lack of effective methods for the teaching of Chinese character recognition and memorization, which is in accordance with the characteristics of Chinese characters and the universal laws of human memory.

The first reason is the most essential, because most of the Chinese learners' mother tongues' writings are phonemic scripts. Phonetic thinking habits make it difficult for them to adapt to the ideographic logic in Chinese characters, coupled with the illusion of what "Pinyin" can replace Chinese characters. It makes the learners' "Chinese character cognitive disorder" problem worse.

Therefore, in order to solve this issue, we urgently need an analytical and scientific approach. The first step is to face up to the uniqueness of Chinese characters, to clarify the relationship among the form, sound and meaning of Chinese characters.

1. Face up to the uniqueness of Chinese characters

Generally speaking, we regard Chinese characters as a kind of language recording tool attached to spoken Chinese. However, through a comparison of the world's current languages (English, French, Spanish), we find that the inherent configuration logic of Chinese characters does not have a direct relationship with spoken language. It is distinct from the internal phonemic script logic in English, French, or Spanish. For example, the word "antibody" in English, phonetically, has eight letters corresponding to eight phonemes in the English language: Four vowel sounds and four consonant sounds. From a word-building perspective, the word is a compound of a morpheme "anti" and a word "body". "Anti" and "body" don't have meaning in themselves, but the sounds they represent do. /ˈænti/ has the meaning of "resistance", and /bɒdi/ has the meaning of "body". The pronunciation of /ˈæntibɒdi/ has the meaning of "antibody", which is used in the terminology of the pharmaceutical industry. We call this type of writing phonemic script. Because the writing order of each letter (or combination of letters) in a word corresponds to the pronunciation order of the basic meaning unit "Morpheme" or "Word" in spoken language. Although the phonemic scripts also have a combination based on semantic logic to express the meaning of words, such as the above-mentioned "antibody", phonemic script logic is still the most basic way.

However, there is no direct correspondence between the internal configuration logic of Chinese characters and their pronunciations. An integral "Zi" (字) corresponds to a morpheme in spoken language, and we cannot find the direct connection between form and sound in it as well as in the phonemic scripts. Generally, Chinese characters are "ideographic writings" which is made up of one or more "components" with certain meanings, combined together according to a semantic logic and corresponds to the spoken words in which morphemes are pronounced. Wang (2002) pointed out:

From the origin, pictophonetic characters are based on their "ideograms" (义符) and their "phonetic indicators" (声符) are due to the passive transformation of the added "ideograms" (义符). Not only are they not the product of expressiveness of sound, but they are obviously the result of the stubborn insistence of Chinese characters on expressiveness of meaning. The "phonetic indicators" (声符) do not need to express sound accurately, and they have no function of quoting. Hence, Chinese characters can transcend times and dialects."[2]

The explanations of the formation motivation of each character and the other characters mentioned in this article are based on "Chinese characters etymology" wrote by Li (2012) (see Figure 1)

Figure 1 Configurational logic sample of Chinese characters.

Form	Sound	Configuration category	Configurational logic
课	kè	Syntagmatic ideography	"讠": Words, "果": Fruit. The combination of the two components "To check out verbally"; "To check" in ancient meaning, and "To teach" in modern meaning.
束	shù	Syntagmatic ideography	"木": wood (tree), "口": Rope. The combination of the two components "To bind a tree with a rope". The modern meaning is "To tie".

The initial form of Chinese characters was not "Zi" (字) but "Wen" (文). In a word, "Zi" (字) is a kind of "Wen" (文) with sound, and before "Zi" (字), "Wen" (文) had long existed, but it was without sound. "Zi" (字) was born on the basis of "Wen" (文). The silent "Wen" (文), combined with sound, has become the character "Zi" (字). The Swedish sinologist Gaobenhan (1946, known as Bernhard Karlgren) made the same point, arguing that "In the earliest stages of Chinese writing, the characters were not phonological, but Pictogram. That is to say a symbol marks the meaning of a word rather than its pronunciation."[3] "Wen" (文) was a symbol or picture recording important events in human life, which has no direct connection with spoken language.

Their meanings are broader and more profound than those of modern Chinese characters. As these symbols are gradually connected with spoken language, they gradually change from "Wen" (文) to "Zi" (字), which is used to record spoken language.

Xu Shen explained this in the preface to *Shuo Wen Jie Zi* almost 2000 years ago:

In ancient times, Bao Xishi, as the king of the world, looked up at the celestial phenomena, looked down at the geography, watched the markings of birds and animals and what the land was suitable for. Taking examples from himself and all things surrounding, he began to create “the Eight Trigrams” (八卦) to understand the morality of the gods and express the situation of all things. By the time of Shennong, things were recorded by knotting, and everything was complicated, and fake things kept happening. Cang Xie, the historian of the Yellow Emperor, saw the footprints of birds and animals, knew that textures could be distinguished from each other, and began to create “Carvings” (书契). When Cang Xie started to create the writing, he drew their graphics according to the images of things, so it was called "Wen" (文). Later, it was called "Zi" (字) when the phonetic symbols combined with each other. "Wen" (文) is the natural phenomenon of things, and "Zi" (字) is gradually increased by the culture.[4]

This passage once again clearly illustrates the mother-child relationship between “Wen” (文) and “Zi” (字). Xu Shen traced the origin of “Writing” to the “Carvings” (书契) and described the “Carvings” (书契) as “wen” (文). At the same time, Xu Shen regards “Wen” (文) as the basis of “Zi” (字), and further points out that “Zi” (字) is gestated by adding “Sheng” (sound). However, because the origin of “Zi” (字) is “Wen” (文), the internal logic of “Zi” (字) has no direct connection with spoken language, so it cannot be completely integrated with daily language expression. Even if the pictophonetic character has “sound notes” (声符), the main logic of the internal configuration is still to express meaning.

Therefore, Chinese characters are unique, they are different from phonemic scripts. This ideographic writing is based on a logic of semantic combining and corresponds to the “Morpheme”. It is the sum of sound, meaning and form. It is a written symbol which is composed of one or more ideograms, sometimes with phonetic indicators. The basic memory unit of Chinese characters is “Component”, and the basic memory logic should conform to the logic of semantic combining between components.

2. Enlightenment of memory principle of cognitive psychology on Chinese character recognition and memorization

In his book *Cognitive Psychology*, Goldstein (2018) pointed out: quality memorization is based on the scientific encoding and decoding of things.[5] So is the memorization of Chinese characters. This scientific coding must conform to the internal configuration logic of Chinese characters and the Universal Memory Law of human beings. Components are the basic units of Chinese characters cognitive memorization

The scientific coding and decoding of Chinese characters cannot be based on the deconstruction of Chinese characters from the perspective of stroke, for three reasons:

1. The information of stroke is too single, it does not contain sound and meaning information.

2. It is difficult to limit the number of strokes of a single Chinese character in accordance with the number of operational units of the human short-term memory, that is, 7+/−2.[6]

3. It is difficult to explain the configurational motivation with the strokes in Chinese characters.

So the memorization of Chinese characters, especially for beginners, has to be operated in a way that is different from the internal structure of strokes. The basic unit of memorization must conform to the following characteristics:

1. Having the information of form and sound; form and meaning; or form, sound and meaning.

2. After the character is decomposed, the number of configuration units does not exceed the range of “7+/−2”.

3. There must be a configurational motivation in the connection between the configuration units.

“Components” fully conform to the above conditions. Wang (2002:35) defined component as “when a form is used to form other characters and becomes part of the character being formed.”[7] According to Fei (1996: 20--26): A component is a character-formation unit with the ability to form characters independently in modern Chinese characters, which is greater than or equal to strokes and smaller than or equal to whole characters.[8]

After studying 1,000 Chinese characters in “Commonly used characters and commonly used words”, Zhang (1990) elaborated:

From the statistics of components and structures, we can see that the basic components of the most commonly used

Chinese characters are very limited. That makes it possible for us to carry out systematic training of components and structures in the primary stage of Chinese character teaching.[9]

That is to say, no matter how many Chinese characters there are, they are all made up of a finite number of components. The following is a breakdown of the components from different perspectives.

1. Single stroke and multiple stroke components

This classification is mainly based on the number of stroke parts. A single stroke component is a component consisting of only one stroke, such as "一" (one), "乙" (second), etc. A multiple stroke component is a component consisting of two or more strokes, such as "亻" (human), "曰" (say), etc.

2. Independent components and non-independent components

This classification method is based on whether the components can build independently a character. An independent component can form a character independently without other components, such as "日" and "月" in the character "明" (light) and "兑" in the character "说" (speak). Contrarily a non-independent component cannot form a character independently, for example, the word "讠"in "说" (speak) and "氵" in "河" (river).

3. Non-composite components and composite components

Non-composite components cannot be split, such as the "八" and "刀" in the character "分" (separate), which cannot be further split; composite components are those made up of two or more basic components, the composite components can be further split, for example, "森" (forest) can be further split into "林" (woods) and "木" (wood), which is the first split of "森" (forest), and "林" (woods) can be further split into "木" (wood) and "木" (wood), so "林" (woods) is a composite component, not a non-composite component.

4. Basic and derivative components

This classification is based on the relationship between the components. The basic component is the base of the derivative component, and the derivative component is diverted from the basic component. For example, "大" (big) is a basic component, its diverted components are 头 (head), 天 (sky), 犬 (dog), 夭 (die young), 矢 (arrow), 失 (lose), 央 (decisive), etc.

Based on the principles of memory in cognitive psychology, Cui (1997) elaborated the functions of Chinese character components in the process of Chinese character recognition and memorization.[10] Below is his point of view.

The fewer components that a character contains, the better it is for memorization

We know that memorization occurs in short-term memory, and the most critical part of this process is information encoding, and the number of information units are limited to 7+/−2. If we limit the number of components of Chinese characters to about 5, it will greatly reduce the memorization burden of students comparing with the old method of using stroke as memorization unit, and improve the efficiency and quality of Chinese character memorization. The more components have appellations, the easier characters are memorized

The content of memory includes "Image memory", and this kind of memory is not only based on the vision, but also based on hearing, smell, touch or taste. If we give these basic components sound, their "Images" will be more specific in students' cognition, and easier to be stored in long-term memory for recall and recognition. The more explicit the meaning of components, the easier characters are to be memorized

This paper discusses the unique nature of Chinese characters, and the formation logic of its initial form "Wen" (文) is to express meaning. Although since "Zi" (字) replaced "Wen" (文), some phonetic components were produced, but the semantic configuration logic in Chinese characters has not changed substantially. That is to say, it is entirely possible to find out the meaning of the components of Chinese characters. We can still find out the meaning of these components by examining the etymology of characters. By doing so, the components cannot only have a sound, but also a meaning. Their images can become more concrete and even trigger an emotional memory, because meaning is always related to one's emotions. This will undoubtedly improve the memorization efficiency and quality of Chinese characters. The recognition and memorization of Chinese character components can reduce the errors of Chinese character recognition

The mutual interference of similarity information is one of the reasons for human forgetfulness. This phenomenon also exists in the memorization of Chinese characters, such as "老" (old) and "考" (the ancient meaning is "old man"), which are not only similar in form but also very similar in sound. So if we can explain the two characters by emphasizing the different components "匕" and"  " in them, "匕" means "Man", and "" means "Walking stick". Combining the formation logic of the two characters and their practices in words, the teacher can help the students to remember the two characters effectively and qualitatively.

The grouping of character family is helpful to the recognition and memorization of Chinese characters

Du (2004) expounded the importance of the connection between Chinese characters in the memorization teaching of Chinese characters. She believes that students should be made to realize that Chinese characters are not a fragmented system, but a logical system full of motivation. Only when teachers make students truly aware of the systematic nature of Chinese characters, then will the students stop seeing Chinese characters as a monster to avoid. One of the systematic manifestations of Chinese characters is the family of characters.[11] The character family is a group of Chinese characters organized according to the logical relationship between the characters in the aspects of "form", "motivation" and "etymology". The grouping of character families is often based on the premise of a "Basic character", to find out the Chinese characters derived from it. For example:

(1)日 (sun): 阳 (positive principle in nature), 旧 (ancient)

(2)旦 (dawn): 查 (check), 担 (carry)

The above six characters [selected from the Character level 1–4 of "International Curriculum for Chinese language Education"[12] are all derived from the word "日", in which "日" is a character which cannot continued to be split. "阳". "旦"and "查" can be split into ideograms. "担" can be split into an ideogram "扌", and a phonetic indicator "旦". "旧" is a modern simplified characters. It cannot be analyzed and explained by looking through the etymology, but because its formation is put "丨" on the left-hand side of "日", so it is also placed in "日" family.

If the teaching of component memorization and the teaching of component configuration based on formation logic are to give "Meta-cognition" from the inside of characters, the teaching of Chinese characters based on character family mainly focuses on the relationship between the characters and the external characters. In fact, as long as it is a human memorization activity, it must be related to the memory principle of cognitive psychology. "The principle of memory" is not a way to help people better remember information, but a law discovered by psychologists. Therefore, the so-called "Character family grouping helps Chinese characters to be memorized" refers to how to make the character family grouping mode conform to the "Memory principle of cognitive psychology". Consequently, the teaching of Chinese character memorization is more efficient and of better quality. This is entirely feasible for the following reasons:

2.1 The fact that characters are repeatedly composed by a relatively small number of components proves that the brain can remember them with quality

The number of components is limited and they can be divided into composite components and non-composite components. After studied on the component length (number of components) of the most used 801 characters selected from the 8822 words in the "Hanyu Shuiping Kaoshi cihui dengji dagang" (Vocabulary Level of HSK Syllabus), Cui (1997: 49--54; in Chinese) came to the following conclusion: "The most Chinese characters are composed of two and three components, accounting for 69% of the total, and 95.1% are composed of 1–4 components."[13] Components containing information of sounds, meanings and forms are easier to encode and memorize than strokes, but components are not cobbled together without logic. People have to find out this logic of formation motivation between the components in order to really memorize Chinese characters.

2.2 The fact that the same component is repeated over and over in different characters allows the brain to make a qualitative recall and recognition of it

The basis of the theory of character family is to find common ground among Chinese characters. The essence of this common ground is the repeated use of the same components in the formation of characters. When teachers help students to remember the components and characters, they can guide them to gradually have the sense and ability of Chinese Character Association based on the theory of character family. This ability is the recall and recognition of the sound and meaning of the components and the repeated extraction of information. Teachers should take the initiative to help the students cultivate a “Meta-cognition”. That is, the cognition to components, the cognition to formation motivation, and the cognition to character families. Students will certainly improve the quality and efficiency of their character memorization, not only through the training of the component configuration, the training of the phonetic and semantic deduce of characters, but also the induction of character family, and the character-family grouping exercises.

2.3 The eventive semantic collocation of components based on the character families is helpful to the memorization and cognition to the motivation of character formation

Wu (1998) pointed out:

Since Hermann Ebbinghaus invented episodic memory in 1879, it has been an important item of psychological research for a long time. After the 1960s, when psychologists discovered that meaning played an important role in long-term memory, the focus of psychological research began to shift to the study of semantic memory. However, in modern cognitive psychology, episodic memory still has its reasonable theoretical basis and its existence value.[14]

Wang Yin’s “Event domain cognitive model” theory also supports this understanding.Wang (2007) thought:

People experience and know the world in the unit of "event domain", and store it in the brain as a knowledge block. On the basis of people's experience and understanding of many specific events, people gradually summarized the abstract conceptual structure of events, and gradually formed various expression phenomena in language.[15]

ECM theory has a strong explanatory power. Wang (2005) pointed out: Event-Domain Cognitive Model (ECM) can not only include the explanatory functions of cognitive model (CM) and ideal cognitive model (ICM), but also can analyze and explain many phenomena at semantic and communication levels in a unified way from the perspective of taking into account the relationship between static events or dynamic events. Take a look at Figure 2.

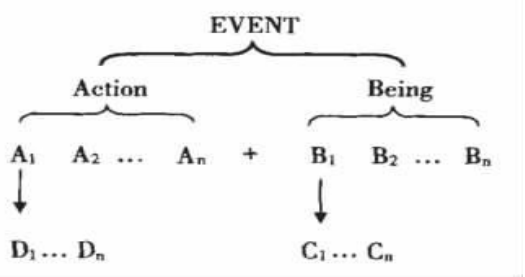

Figure 2 Event domain cognitive model (ECM).

An Event (E for short) consists of two core elements: Action and Being. An action (both dynamic and static) consists of a number of specific sub-static actions or sub-dynamic actions (such as A1, A2 … in Figure 2). A being (can be a person, thing, tools and other entities, it can also be an abstract or fictional concept), or it can include several individuals (such as B1, B2 …in Figure 2). An action or being can have many typical characteristics (such as D1 … in the chart) or classification information (such as C1 … in Figure 2), respectively. Such an event domain may contain several elements, not only the agent, the objective, the force, the scene and so on, but also the hierarchical relationship between these elements.

From this point of view, event domain plays an important role in communication. An event can contain many elements of action and being, we can use only one or several elements to express the whole event clearly, this is the default information which we have mentioned. It is actually a metonymy in which the parts take the place of the whole. There is also an “Event domain” phenomenon when the components of Chinese characters have different configurations, and it often has a certain degree of coincidence with the grouping of characters.

For example: An ECM based on the “日” family selected from the list of Characters of 1–4 level of HSK syllabus (see Figure 3).

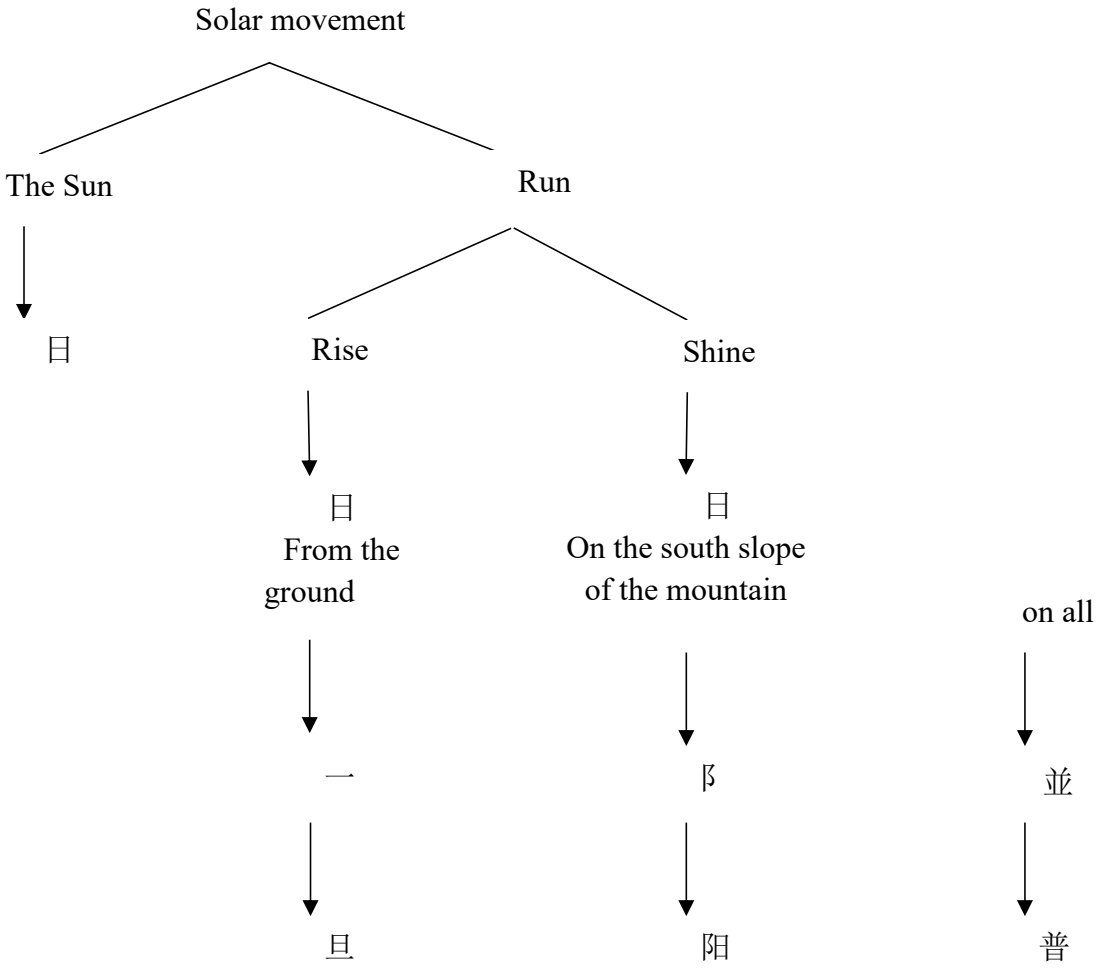

Figure 3 “日” family ECM.

阳, Component Meaning:

日: Daylight exposure, 阝: The South Slope of the Mountain

Internal Semantic Structure of the Component:

日, Sun → Sunshine (metonymy)

阝, Mountain → The South Slope of the Mountain (metonymy)

The semantic case structure between the internal components of the whole character:

Subject (日), Action (日), Direction (阝) (see Figure 4).

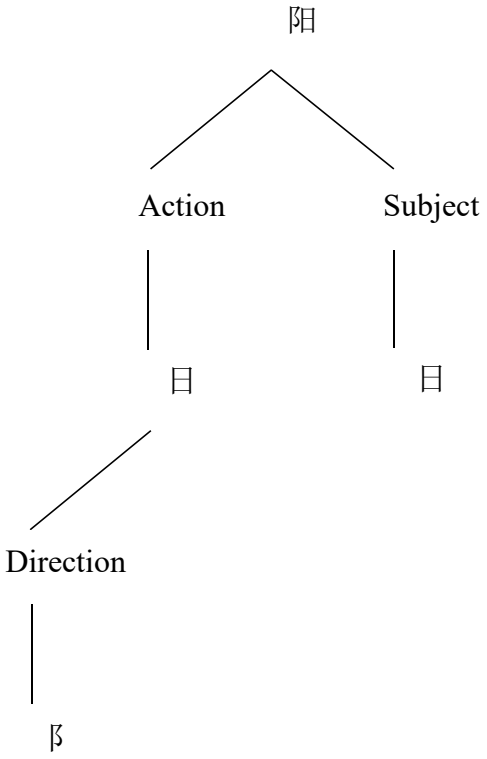

Figure 4 “阳” semantic structure.

Whole Character formation motivation:

“The Sun beat down on the south slope of the Mountain”.

2. 普, Component Meaning: 日: Daylight exposure, 並: All

Internal Semantic Structure of the Component:

日, the Sun → The sun shines,

並, Two people standing together

→ together (metonymy) → all (Metaphor)

→ Two persons (metonymy) → all (metonymy)

The semantic case structure between the internal components of the whole character:

Subject (日), Action (日), Instrument (並), Environment (並) (see Figure 5).

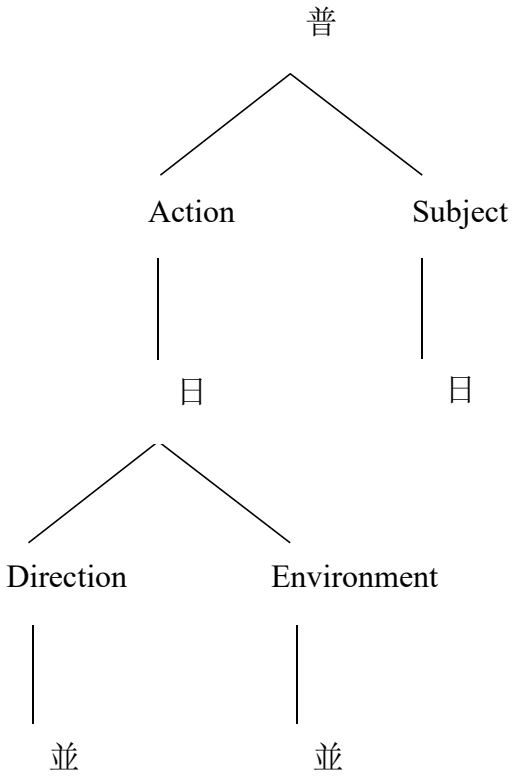

Figure 5 “普” semantic structure.

Whole Character formation motivation:

“The Sun shines all over”

3. 旦, Component Meaning: 日: Sun, 一: Ground

Internal Semantic Structure of the Component:

日, Sun → The sun rises

一, Earth → ground (metonymy)

The semantic case structure between the internal components of the whole character:

Subject (日), Action (日), Locative (一) (see Figure 6).

Whole Character formation motivation:

“The Sun rises from the ground”

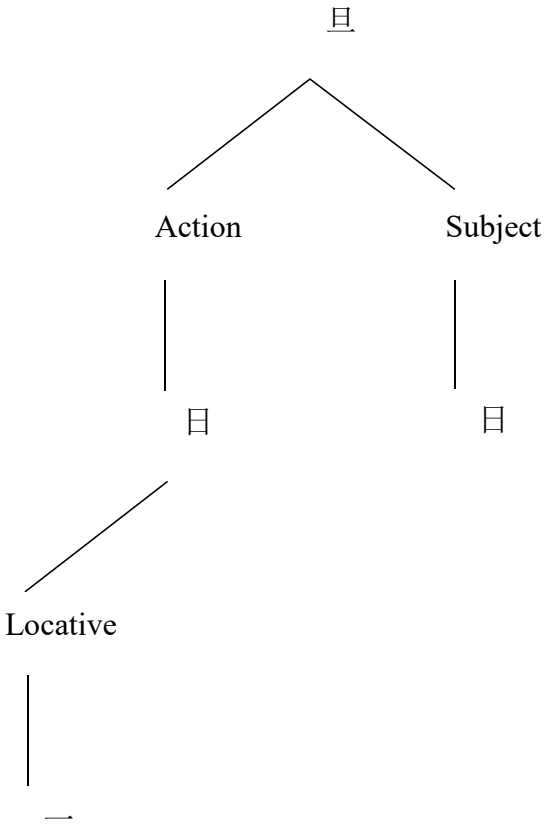

Figure 6 “旦” semantic structure.

担, Component Meaning:

扌 (Detonation: Shoulder the load), 旦 (Tone indication)

Internal Semantic Structure of the Component:

扌, 手 → Arm (metonymy) → shoulder (metonymy) → shoulder (metonymy)

The semantic case structure between the internal components of the whole character:

Instrument (扌), Action (扌) (see Figure 7)

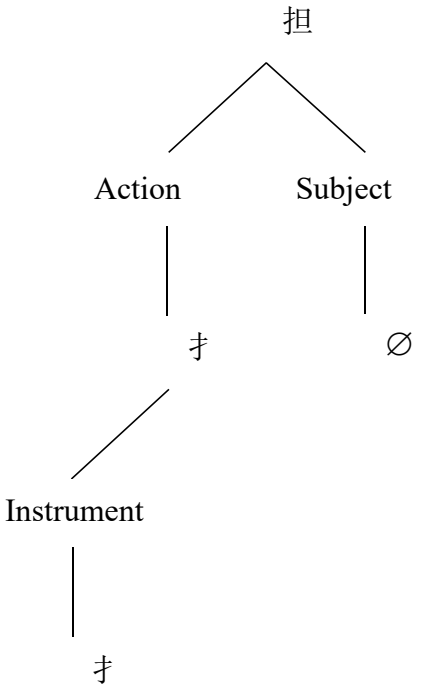

Figure 7 “担” semantic structure.

Whole Character formation motivation:

“Carry it on shoulders”

Through the examples mentioned, we can see that the way to explain the formation logic of characters based on character family and the “Event domain cognitive model” theory can help students understand the semantic composition process of the components in a whole character with an eventive logic and even integrate different characters in the same and bigger event. This is in line with the basic principle of episodic memory, which can help students to better store the initial encoding of the internal components in their long-term memory. Of course, not all Chinese characters in the same family can be integrated into the same event domain, such as “担”.

3. Operational principle

The principle of separating components from an integral character. As the role of component theory in the teaching of Chinese characters has been discussed above, we should draw up the principle of separating components of an integral character on the basis of “Specification of modern common character components and component names. GF0014-2009”.[9]

1. Follow the original formation motivation logic of Chinese characters, “The etymology of characters”. Such as: “分” (separate) split into “八，刀”, “相” (observe) split into “木，目”.

2. If it is impossible to analyze the logic of formation motivation, or if there is a contradiction between the logic of formation motivation and the modern form of character, it shall be split according to the modern form. Such as: “朋” (friend) is divided into “月，月”, “执” (hold) is divided into “扌，丸”.

3. Overlapping Strokes, try not to split. Such as: “串” (bunch) cannot be divided into “中，中”, “东” (east) cannot be divided into “七，小”.

4. After the separating, components are non-independent components or can no longer constitute other characters, try not to split. Such as: “非” (negative).

5. If the structural character causes a component to be separated, the separated parts of this component shall still be integrated into its original form after separation. For example: “裹” (wrap) is divided into “衣，果”.

6. Try to give meaning to parts according to “Etymology”.

7. The pronunciations based on Modern Chinese characters endow the phonetic components with appellation.

4. Principles of character family grouping

4.1 The fewer Chinese characters that exist in a character family, the easier it is for us to connect characters and to memorize them

We discussed above that the capacity range of short-term memory is limited to the operation of 7+/−2 information units at the same time, hence if the teacher limits the number of a character family to about 5 in his/her teaching, it will help the students to carry out the connection between the characters and the memorization of each character. That is to say, if the actual number of Chinese characters in a family is more than 9, it is necessary to consider dividing it into two character families and explaining them twice.

4.2 The more stable the meaning of the basic character is in the family, the more efficient to connect the characters and to memorize them

Some components do not have only one meaning. For example, "月", which has the meaning of "Moon", also has the meaning of "Flesh". In this case, it is more efficient to classify the characters diverted from the meaning of "Moon" as a family, the characters diverted from the meaning of "Flesh" are arranged in another family, which is helpful for students to follow the logic when they associate characters.

4.3 The more stable the pronunciation of the basic character is in the family, the more efficient to connect the characters and to memorize them

The formation of some characters follows the logic of "Adding sound to express sound" or "Adding form to express meaning", and the characters produced by these two formation logics are commonly known as "pictophonetic characters". For example, "腰" (waist) is actually a character formed by the addition of the ideogram "月" on the basis of "要", and "齿" (tooth) is formed by the addition of the phonetic indicator "止" on the basis of "  ". These "pictophonetic characters" provide us with another basis for the connection of Chinese characters, "Pronunciation". Of course, sometimes the pronunciation of characters will have a certain change, or tones, or consonant sounds, or vowel sounds. The greater the similarity in pronunciation of the phonetic indicators between characters, the easier it is for them to be related to each other and to be remembered.

4.4 The more clear and easier to understand the formation motivation of each character in the family, the more efficient to connect the characters and memorize them

Logical memory, an important part of memory, is based on a high level of understanding of information. Logical memory is needed for the rational combination of components in Chinese characters. The clearer the logic is, the easier it will be for students to understand and memorize characters. However, the logic of the formation of Chinese characters has undergone great changes since ancient times. There are many characters for which we cannot find their original formation motivation by means of modern forms alone. For example, the character "育" (bear), which is itself a modern simplified character, we cannot explain clearly the combination of the two components "  " and "". But after investigating the Etymology, the author finds that "" is a variant of "厶", which means "the fetus is head down", and "" is a variant of "月", which means "flesh" here. The two together mean that "The fetus is a part of the mother's flesh which needs to be nurtured", the character meaning is "bear", "raise". Consequently, it is necessary for teachers to examine the components of the characters they teach and the logic of their formation motivation, so as to help students memorize characters more efficiently.

In a word, the teaching of Chinese characters is very important in Chinese teaching. In fact, the problems we are facing now are not the problems of teaching methods and strategies, but the problems of linguistics. How can we discuss and study the pedagogy, if what are Chinese characters, the relationship between their internal structures and spoken

language is not clear? Although the breadth and depth of Chinese character teaching research is expanding and deepening, there is still no effective solution. The fundamental reason is that it has not been thoroughly solved in the field of basic linguistics. It is urgent for us to recognize the uniqueness of Chinese characters in linguistics, which involves not only the internal logic of form, sound and meaning of Chinese characters, but also the semantic and grammatical relations among Chinese characters, words and sentences. Only in this way can we solve the problem of "Chinese character cognitive barrier" which has long puzzled the learners and students of Chinese characters whose mother tongue is phonemic writing.

5. Data availability statement

Data are available from Miller, George A. 1956. The magical number seven, plus or minus two. Psychological Review. 63 (2): 81--97.

Conflicts of interest

The author declares no conflicts of interest regarding the publication of this paper.

References

[1] Confucius Institute Headquarters. International Curriculum for Chinese Language Education. Beijing: Beijing Language and Culture University Press; 2014.

[2] Cui Yonghua. Chinese character components and teaching Chinese characters as a foreign language. Applied Linguistics. 1997; (3): 49--54.

[3] Du Lirong. A study on the teaching of Chinese characters as a foreign language by the method of connection among Chinese characters. Journal of Southwest University for Nationalities. Humanities and Social Sciences. 2004; (7): 418--422.

[4] Fei Jinchang. A probe into the components of modern Chinese characters. Applied Linguistics. 1996; (2): 20--26.

[5] Goldstein E. Bruce. Cognitive Psychology, trans. by Ming Zhang. Beijing: China Light Industry; 2018: 224.

[6] Karlgren Bernhard. The Chinese Language: An Essay on its Nature and History, trans. by Hongfei Nian. Beijing: The Commercial Press; 1946:18.

[7] Lu Jianming. Tongyong guifan hanzibiao wei hanyu guoji chuanbo tigong guimo he biaozhun. General standard Chinese character list provides scale and standard for Chinese international dissemination. Yuyan wenzi bao. 2014: 743.

[8] Miller George A. 1956. The magical number seven, plus or minus two. Psychological Review. 1956; 63 (2): 81--97.

[9] State Language Commission. Specification of modern common character components and component names. Specification, Rule No. GF0014-2009. Beijing: Language and Culture Press; 2009.

[10] Wang Ning. Hanzi gouxingxue jiangzuo. Lecture on Chinese character morphology. Shanghai: Shanghai Educational Publishing House; 2002.

[11] Wang Yin. Event domain cognitive model and its explanatory power. Modern Foreign Languages. 2005; (1): 20--29.

[12] Wang Yin. Cognitive Linguistics. Shanghai: Shanghai Foreign Language Education Press; 2007: 240.

[13] Wu Shixiong. Enlightenment of memory principle of cognitive psychology on Chinese character teaching. Language Teaching and Linguistic Studies. 1998; (4): 85--94.

[14] Xu Shen. Shuo Wen Jie Zi [Origin of Chinese characters], trans. by Kejing Tang. Beijing: Zhonghua Book Company; 2018.

[15] Zhang Wangxi. From Chinese character component to Chinese character structure -- On foreign Chinese character teaching. Chinese Teaching in the World. 1990; (2): 112--120.