



記憶法で漢字の意味と書き方を覚える

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An Anthropomorphic Kanji-Verse: Using mnemonic stories to remember the meaning and writing of Chinese Characters

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Abstract: This paper will explore cognitive differences that can be attributed to the different orthographic systems used in English and Japanese, and then examine how a mnemonic technique could be used to exploit these differences. Heisig's mnemonic system for remembering the writing and meaning of Chinese characters (*Kanji*) is a Component Analysis method style of learning that attempts to create an *alphabet* of Kanji elements that can be used to both construct (write) and deconstruct (translate) Kanji. This has the potential to help prevent English-speaking students of Japanese from losing interest and motivation. A technique involving anthropomorphizing elements of the Kanji to help make the mnemonic stories more memorable will also be explored, using examples from the author's own learning journey.

Keywords: Kanji, mnemonics, education

1. Introduction

Of all the creatures on this Earth, it is only humans who use written symbols to represent the spoken word (Hung & Tzeng, 1981). The form these symbols take (orthography) varies across languages, and this has ramifications for the bilingual individual. Progress in becoming literate in two languages (biliteracy) is believed to be more affected by orthographic similarity than by the bilingual proficiency of the learner (Bialystok, 2001). Reading is comprised of both bottom-up processes (decoding skills such as pattern recognition, letter identification and lexical access) and top-down processes (conceptual skills such as background knowledge, language proficiency), and if the writing system of the second language (L2) is familiar (eg. English and Spanish), then most difficulties in reading are likely to be located in the top-down processes. However, if the writing system is unfamiliar, then the bottom-up processes will also be affected (Bialystok, 2001). The Japanese writing system consists of both syllabic and logographic elements (Wydell, Patterson & Humphreys, 1993), making it quite orthographically different to English. Research suggests that the orthography of a person's native language (L1)

influences the techniques they use when reading a second language (L2) (Akamatsu, 1999). This has implications for students of Japanese with English as their L1.

2. The Orthographic Systems of English and Japanese

The three main orthographic systems currently used in languages around the world are logographic, syllabic, and alphabetic (Koda, 1989). Logographic systems use morphemes as the representational unit, whereas syllabic and alphabetic systems are based on phonology; syllables or phonemes respectively (Koda, 1989). English uses an alphabet of 26 letters to denote words based on phoneme segmentation, with separate characters being used for consonants and vowels. Japanese uses a different system.

The Japanese writing system combines both syllabic and logographic systems into a unified whole (Yamazaki, Ellis, Morrison & Ralph, 1997). Logographic Chinese characters (*Kanji*), the focus of this paper, were imported into Japan at various times through history beginning as long as 1,500 years ago (Banno, Ikeda, Shinagawa, Tajima & Tokashiki, 2013). They do contain some phonological information, in the form of the *radical* (Wydell et al, 1993), but in Japan, a single Kanji may have many different possible readings. For example, 生 can be read in more than 10 ways (Paxton & Svetanant, 2014) and therefore, the phonological information contained within the radical is of considerably less use than it is in Chinese (Koda, 1989).

2.1. Orthography and Cognition

Japanese Kanji represent a whole word or idea with no regard for its sound (Koda, 1989). This means that a Kanji cannot be broken down into its constituent phonetic parts like an alphabetic word can be (Wydell, Butterworth & Patterson, 1995). In contrast, English words are created by combining letters together to make the sounds of the spoken word (eg. c + a + t = cat), and because of this difference, the cognitive processes for learning to read the two languages are believed to be very different (Akamatsu, 1999). A Japanese reader uses the morphology of the word to access the phonology, whereas an English reader will use the phonology to access the morphology (Koda, 1989). For this reason, it is possible for a beginner L2 reader of English to read an English word aloud without understanding its meaning, but the same cannot be said for L2 readers of Japanese. Being able to pronounce an individual Kanji should, in principle, indicate a knowledge of the character's meaning. It is also possible for a reader to know the meaning of a Kanji without being able to pronounce it, as is often the case with Chinese students (Heisig, 2011).

2.2. Orthography and Education

The Japanese government has designated 2,136 Kanji as *common use* characters (Agency for Cultural Affairs, 2010). Children start learning Kanji once they enter primary school around the age of six. In primary school they learn 1006 Kanji (Ministry of Education, Culture, Sports, Science and Technology, 2019). The remainder of the 2,136 common use Kanji are taught in junior and senior high school. The main method used to teach (and learn)

Kanji in Japan is rote repetition (Shimizu & Green, 2002). This reliance on rote learning may in part stem from the lack of phonological information contained in the Kanji.

When learning to read and write Kanji, native English speakers will often try to resort to their phonological L1 strategy of analyzing and processing the intra-word components (Akamatsu, 1998), only to find that Kanji can't be deconstructed in that way (Steinberg & Yamada, 1978). In English, the letters create the pronunciation which leads to the meaning, whereas in Japanese, the Kanji leads to the morphology which then allows access to the lexical information. Figure 1 shows an example of this difference between the two orthographies.

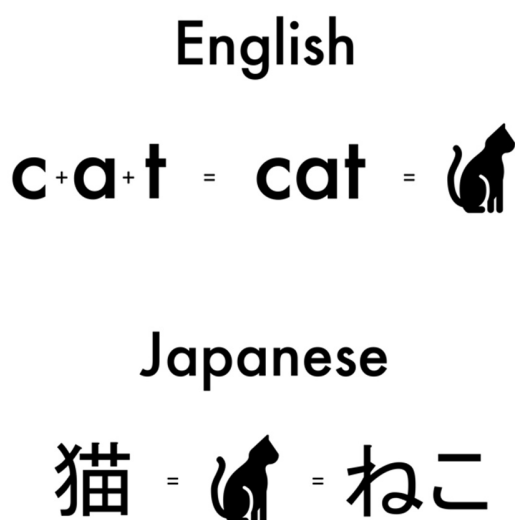


Figure 1. *cat* versus 猫

If it is true, as Akamatsu (1999) states, that once the L1 reading strategy has caused “physiological stability in the brain” (p. 400) it is difficult to learn a different strategy, then it would seem that a technique which allows the Kanji to be constructed with, or deconstructed into, basic elements in the same way that *cat* can be reduced to *c*, *a* and *t*, could benefit native English-speaking students of Japanese. The next section will introduce a mnemonic technique that was developed to address this need.

3. Mnemonics and Kanji

According to Csikszentmihalyi (2008), a *flow state* occurs “at the boundary between boredom and anxiety” (p. 52) and is characterized by enjoyment that can only be achieved “as a result of unusual investments of attention” (p. 46). An activity that is too easy and offers no challenge results in boredom, whereas a task that is too difficult, and seems overwhelming, leads to anxiety (see Figure 2). It is possibly this type of anxiety, brought about by attempting to rote learn the large number of Kanji that must be known to be considered literate, that

causes many learners from alphabetic backgrounds to discontinue their Japanese studies when they move into the intermediate stages of studying Kanji (Haththotuwa Gamage, 2003). For a student who is used to a phonologically based orthographic system, mnemonics may be a better way to study Kanji.

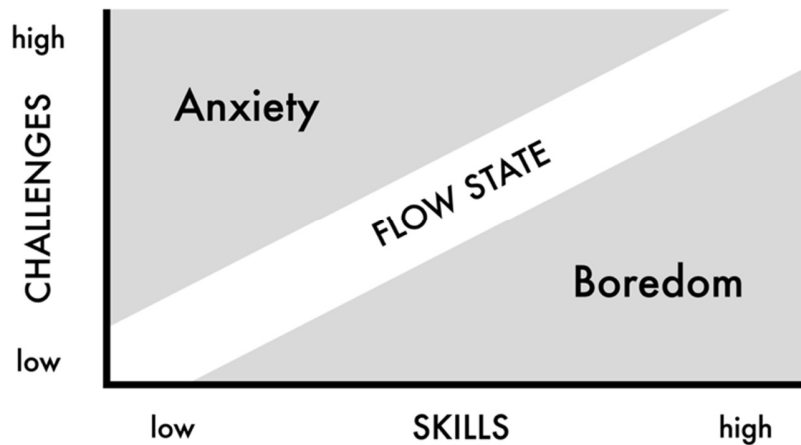


Figure 2. Anxiety, boredom and flow state (Csikszentmihalyi, 2008, p. 74).

Mnemonics, which can be either verbal or visual, convert information into a form that is easier to remember (Cohen, 1987) and bring order to an otherwise confusing system (Willingham, 2021). For a mnemonic method to be helpful for a native English-speaking student studying Kanji, it needs to allow the logographic Kanji characters to be broken down into an alphabet of sorts that can then be combined using a mnemonic story to *spell* the Kanji, in much the same way as letters are used to spell English words (see Figure 3). This type of technique, known as the Component Analysis method, is very different to the Whole-Kanji method that is primarily used in the Japanese education system (Flaherty & Noguchi, 1998). One such system was developed by Heisig (2011).

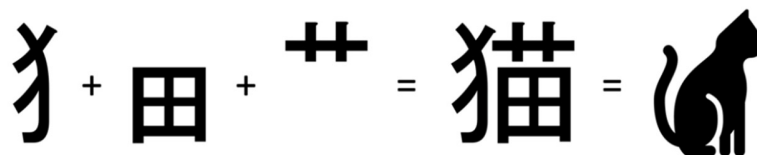


Figure 3. An example of *spelling* a Kanji

Heisig’s technique first aims to break the Kanji down into “the fundamental strokes and combinations of strokes from which all characters are built up” (Heisig, 2011, p.4), which he calls *primitives*. These primitives include, but are not limited to the 214 *determinatives*, also known as *radicals*, (see Appendix A) that are

traditionally used by Japanese people to classify Kanji (Seely & Henshall, 2016). Figure 4 demonstrates how two basic primitives (*top hat* and *bound up*) can be combined to create a Kanji character (*方 direction*).



Figure 4. Two primitives combine to form a Kanji.

Once a simple Kanji has been made from the primitive elements, it too can act as a primitive and be used in a mnemonic sentence with other primitives, or another Kanji (eg. 言 *say*), to make an even more complex Kanji (see Figure 5). This constant building up of primitives upon primitives to make more complex primitives is an example of chunking (Paxton & Svetenant, 2014). A similar technique is also used by chess Grand Masters to reduce cognitive load during a game (Chase & Ericsson, 1982).



Figure 5. Two Kanji combine to form a more complex Kanji.

Component Analysis learning has been shown to be more effective for adult learners than the Whole-Kanji method (Flaherty & Noguchi, 1998). I used Heisig's method of creating mnemonic stories to study Kanji and I now know how to write and translate over 2,750 Kanji. In the next section, I would like to draw upon my personal experience to outline a way to make the technique even more effective.

4. Anthropomorphising the Primitives

My journey through Heisig's *Kanji-Land* was not all smooth sailing. The main hurdle was the creation of mnemonic stories that stuck in my mind. After Kanji number 547, where Heisig stops supplying stories and only shows the primitives for each Kanji, the challenge became too high for my skill level, and I tended to fall out of the flow state. My creative turning-point came after discovering kanjikoohii.com, a website created by a Heisig

devotee that has spawned an online community where people from all around the world come together to share their stories. This virtual community created a social constructivist environment (Vygotsky, 2012) that taught me a valuable lesson about how to create memorable stories.

Anthropomorphism of the primitives was a common theme among the stories that I resonated with. Heisig assigns each primitive and Kanji an English meaning, which he calls a *key word*. In the best of the kanjikoohii stories, primitive meanings were connected to a famous person to turn them into concrete and memorable images. This is similar to a technique that Memory Champions also use. As detailed by Joshua Foer in his 2011 book “Moonwalking with Einstein”, memory athletes incorporate famous people into a system of mnemonic stories known as PAO (Person, Action, Object) when trying to remember the order of playing cards in a shuffled deck.

For example, I might imagine that the Two of Hearts* is Michael Jordan dunking a basketball, the King of Diamonds** is 11-time world champion Kelly Slater riding a wave on his surfboard, and the Six of Clubs*** is Jimi Hendrix playing his guitar. These somewhat mundane PAO images can then be combined to create unique, and often bizarre, PAO images depending on the order that the cards appear in the deck. The first card contributes its Person, the second card gives its Action, and the third card provides the Object. Therefore, to remember the Two of Hearts, followed by the King of Diamonds, followed by the Six of Clubs, I would create an image in my mind of six-foot six Michael Jordan (P) riding a wave (A) on a guitar (O). Table 1 details all of the possible highly-memorable images that can be created depending on the order of the three cards. The PAO system has also been shown to be effective in helping people remember more than one high-strength password (Blocki, Komanduri, Cranor & Datta, 2014).

Card Order			
1	2	3	
2♥	K♦	6♣	Michael Jordan riding a wave on a guitar.
2♥	6♣	K♦	Michael Jordan playing a guitar that looks like a surfboard.
K♦	2♥	6♣	Kelly Slater dunking a guitar.
K♦	6♣	2♥	Kelly Slater playing a guitar that looks like a basketball.
6♣	K♦	2♥	Jimi Hendrix riding a wave on a basketball.
6♣	2♥	K♦	Jimi Hendrix dunking a surfboard.

Table 1. How the PAO system can be used to remember playing cards.

* Michael Jordan was number 23, and the Bulls wore a red uniform.

** Kelly Slater is the undisputed King of surfing, and the logo of his former long-time sponsor looks like 3 diamonds.

*** Most of his career took place in the 1960's, he had a song called “if 6 were 9”, and played his music in Night Clubs.

Just as the PAO system allows memory athletes and password users to create memorable stories, anthropomorphizing the primitives allows me to create memorable Kanji stories. Many of Heisig's key words, such as *say* (言) and *direction* (方) are abstract concepts that are difficult to visualize. Heisig does try to address this issue by suggesting the use of a compass as a concrete image for *direction* (p. 181), but while a compass is a concrete image, it lacks uniqueness due to its ubiquity. Abstraction and mundaneness can make remembering difficult (Caplan, 1954), but using the image of a famous person helped me to add concreteness to abstraction and specificity to mundaneness, leading to the creation of effective Kanji stories. The speech that Martin Luther King Jr. delivered in 1963 is the reason that he became my personification for 言, and whenever I need to incorporate 方 into a story, instead of using a mundane compass, I use the members of the boy band One Direction.

Based on Names			Based on Attributes		
Primitive	Key Word	Person	Primitive	Key Word	Person
方	Direction	One Direction	言	Say	Martin Luther King Jr.
厂	Cliff	Cliff Richard	忄	State of Mind	Billy Joel
門	Gates	Bill Gates	力	Power	Arnold Schwarzenegger
斤	Axe	Axl Rose	糸	Thread	Spiderman
林	Woods	Tiger Woods	耳	Ear	Vincent Van Gogh
句	Phrase	Frasier Crane	青	Blue	Smurf
固	Harden	James Harden	目	Eye	Turanga Leela
豆	Beans	Mr. Bean	才	Genius	Jimi Hendrix
禾	Wheat	Will Wheaton	王	King	Kelly Slater

Table 2. Anthropomorphising primitives and Kanji.

I currently have 254 famous people helping me to remember the Kanji (see Table 2 for some examples). When I read the key word, the first famous person that jumps into my mind, either because of their name or their attributes, becomes the personification I use. They may be a historical figure, (eg. Martin Luther King Jr.), part of the pop-culture zeitgeist (eg. the members of the boy band One Direction), or even a fictional character. After deciding on the personifications, all that is needed to remember a complex Kanji such as 訪 *call on* is to create a mnemonic story explaining why, and how, Martin Luther King Jr. would call on One Direction (see Figure 6).

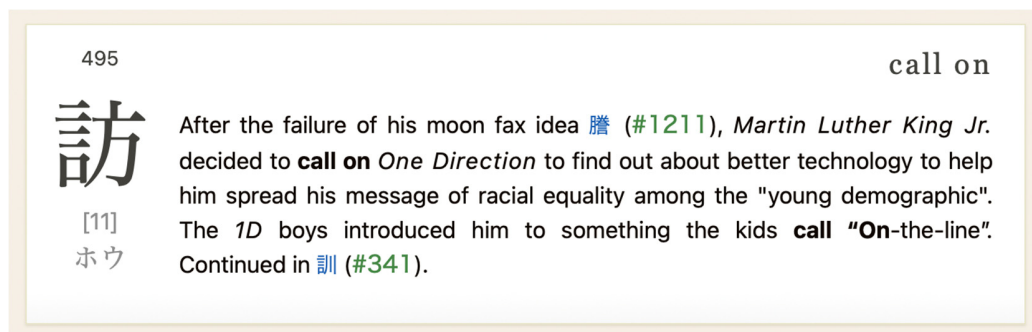


Figure 6. A Kanji story from kanjikoohii.com

5. An Interconnected Kanji-Verse

In my mind, these famous people, be they real or fictional, alive or dead, all live and interact in the one *Kanji-Verse*. As such, it is not unusual for more than one of them to appear in a single Kanji story. 49 percent (1,356) of my 2,760 stories feature famous people as mnemonic aids. The majority (75%) only include one person, but 323 of them contain 2 people, and 19 include 3 famous people (see Table 3). This not only serves to make the stories more interesting for me, but the deeper causal structure actually increases the likelihood of remembering the story (Fletcher & Bloom, 1988).

Famous People	Stories	%
1	1014	75
2	323	24
3	19	1

Table 3. Kanji stories that include at least one famous person.

Just as the characters can interact with each other, the Kanji stories themselves can also interact with other Kanji stories to form more complex, extended stories that continue across time and space. Figure 6 shows that *call on* comes after 謄 *facsimile* and before 訓 *instruction* in a bigger story. This extended story contains five Kanji (謄 → 訪 → 訓 → 詰 → 順). Since the days of Cicero in ancient Rome, it has been known that the “striking and novel stay longer in mind” (Caplan, 1954, p. 219). Based on that advice, I created the following

whimsical and somewhat fantastical five-part extended story. The key words are in bold, and the primitives are in italics.

At first, *Martin Luther King Jr.* thought that sending a **facsimile** 謄 from the *moon* would be a great way to spread his message to the world, but only a *quarter* of the words made it to Earth, so he went in search of better technology. He decided to **call on** 訪 the *One Direction* boys, who advised him that the internet would be a better way to spread his message. *Martin Luther King Jr.* then searched online for **instructions** 訓 for how to *stream* his speech. He was unable to find any **instructions**, so he decided to try another route to connect with youth culture. *Martin Luther King Jr.* created an *aerosol can* for graffiti artists that had the words to his famous *speech* already **packed** 詰 into it, meaning that whenever it was used to graffiti a wall, the words of his *speech* would appear. Unfortunately, this idea landed him in trouble with the law, so he went back on line and eventually found a *page* that showed him how to *stream* his speech. However, he didn't follow the instructions in the correct **order** 順, so the words came out in a different **order**. Instead of "I have a dream", his speech started with "dream I a have". These stories include the "logical systemization and the playful irreverence" (p.7) that Heisig (2011) believes is essential for Kanji success.

Nearly 8% (219) of the Kanji stories I have created interact with at least one other Kanji story (see Table 4). The majority of these interactions (58%) only involve two Kanji. For the nine stories that include more than 8 Kanji, there are two that have 11 Kanji interacting and the remaining seven stories have 12, 13, 14, 15, 16, 17, and 47 interactions respectively.

Kanji Stories	Number	%
2	126	58
3	41	19
4	18	8
5	11	5
6	6	3
7	4	2
8	4	2
> 8	9	4

Table 4. Number of inter-story interactions in the *Kanji-Verse*

The complex story that has 47 interactions (see Figure 7) includes 16 famous people (two main protagonists and 14 supporting characters) and several different narratives that intersect and branch off from each other to

create a rich tapestry of details and word play. There are two main storylines; one that deals the life and times of a notoriously strict Australian Rules Football coach called Mick Malthouse, who is my personification for *taskmaster* 久, and another that is concerned with the trials and tribulations of supermodel Cindy Crawford 女 (*woman*). This inter-story Kanji interaction further increases the overall causal structure of the stories, presumably leading to a greater depth of processing (Craik & Lockhart, 1972).

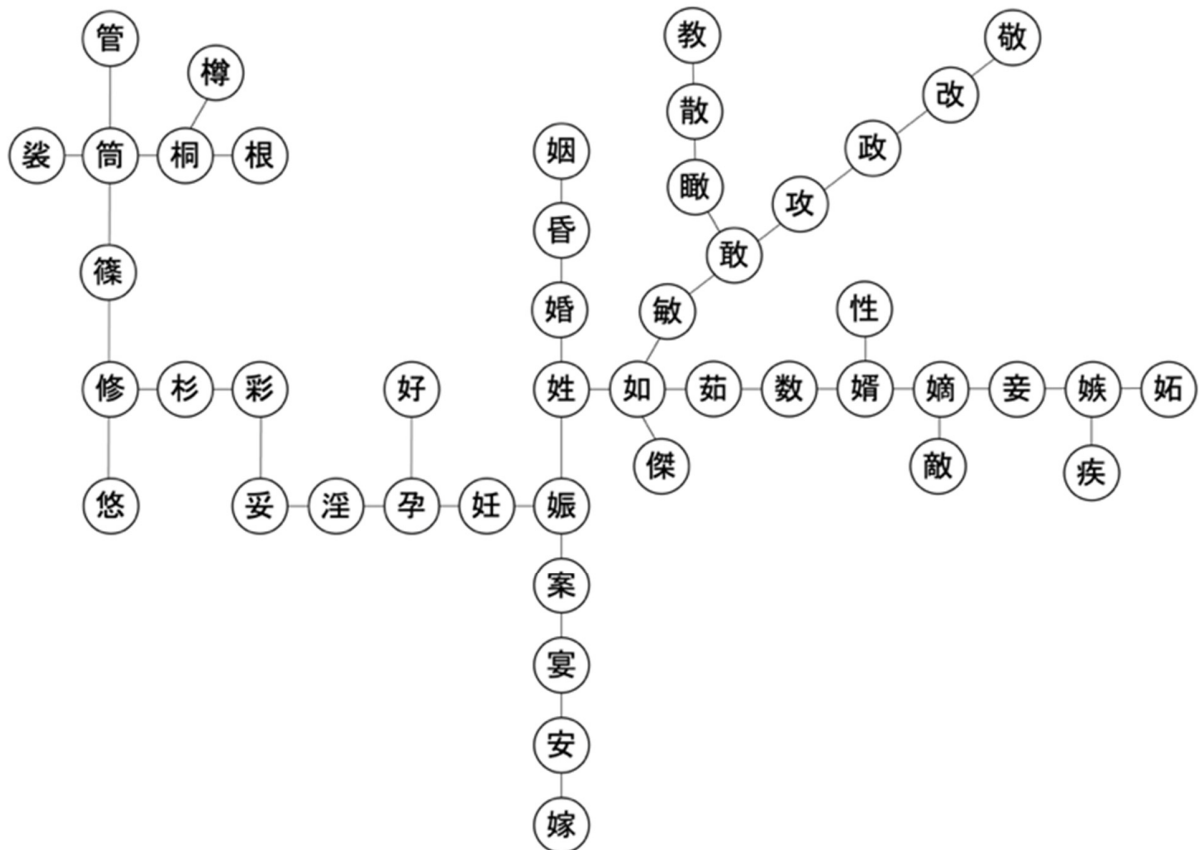


Figure 7. An example of how Kanji stories can interact in the Kanji-Verse.

6. Conclusion

This paper has been concerned with looking at the issues related to becoming literate in an orthographically different language. When learning to read a logographic system such as Kanji, the absence of phonological information forces the L1 learner to develop a cognitive system of parsing the character as a whole in order to retrieve lexical information. The meaning comes before the sound. In contrast, a phonological system, such as the alphabet used in English, is primarily concerned with representing the sounds of the spoken word, after which the meaning can be recovered. This inherent difference appears to lead readers to develop different cognitive processes to deal with the orthography of their L1, and they seem to rely on this strategy even when reading an orthographically divergent L2 script.

This has implications for the development of literacy in Japanese Kanji for English L1 individuals. However, the use of appropriate techniques, such as Heisig's mnemonic system, could help to keep the learner in a flow state by exploiting their L1-reading strategies, thereby preventing the frustration and disillusionment that attempting to remember the Kanji using a rote learning technique can induce.

By no means am I suggesting that this is an easy process. It takes time and dedication. A well-known adage states that we as humans tend to overestimate what can be achieved in a year, and underestimate what can be achieved in ten years. I have so far spent a little over ten years creating my stories, and it is still a process that is challenging enough to keep me in a flow state.

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Appendix A – The 214 determinatives / radicals arranged by stroke number

Strokes									
1	一	丨	丶	丿	乙	乚			
2	二 几 卜	亅 冂 冫	人 刀 厂	儿 力 厶	入 勹 又	八 匕	冂 匚	冂 匚	彳 十
3	口 子 工 弓	口 宀 己 乚	土 寸 巾 彡	士 小 干 彳	久 尢 彡	攴 尸 广	夕 中 彡	大 山 升	女 川 弋
4	心 方 爻 父	戈 无 母 爻	戶 日 比 月	手 臼 毛 片	支 月 氏 牙	支 木 气 牛	文 欠 水 犬	斗 止 火	斤 歹 爪
5	玄 广 示	玉 𠂔 肉	瓜 白 禾	瓦 皮 穴	甘 皿 立	生 目	用 矛	田 矢	疋 石
6	竹 耒 舛 衣	米 耳 舟 西	糸 聿 艮	缶 肉 色	网 臣 艸	羊 自 虎	羽 至 虫	老 白 血	而 舌 行
7	見 走 采	角 足 里	言 身	谷 車	豆 辛	豕 辰	豸 走	貝 邑	赤 酉
8	金	長	門	阜	隶	隹	雨	青	非
9	面 首	革 香	韋	韭	音	頁	風	飛	食
10	馬	骨	高	髟	鬥	鬯	鬲	鬼	
11	魚	鳥	鹵	鹿	麥	麻			
12	黃	黍	黑	黻					
13	黽	鼎	鼓	鼠					
14	鼻	齊							
15	齒								
16	龍	龜							
17	龠								

(adapted from Seely & Henshall, 2016)