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CHINESE CHARACTER MEMORIZATION AND LITERACY: THEORETICAL AND EMPIRICAL PERSPECTIVES ON A SOPHISTICATED VERSION OF AN OLD STRATEGY[1]

Much has been said about the difficulty of the task that confronts beginning alphabetic-language learners of Chinese as a Foreign Language (CFL) as they undertake to learn the writing system (e.g., Everson, 1998, 2002; Hayden 2003; Ke, 1998; McGinnis, 1999). A good part of the difficulty lies, of course, in the extraordinary memory load entailed by the script, a load that represents a memorization challenge unlike anything these students are likely to have encountered before (Walker, 1989).

This memorizational difficulty is a major contributor to the problems students experience in learning to read in Chinese. According to Coady (1997), all second language learners face what can be called "the beginner's paradox" that connects vocabulary knowledge and reading: How do students "learn vocabulary through extensive reading when they do not know enough words to read well" (p. 229)? This problem cannot help but be more pronounced for Chinese than it is for languages with less challenging orthographies. Dew (1994) has articulated the problem—what he calls "a special kind of vicious circle"—as follows: "The complications of the Chinese script . . . make vocabulary building *for reading* a slow and arduous process. The result is that 'I can't read fast because there are too many words I don't know, and it's hard to learn more words because I can't read fast enough to see them recur'" (p. 39). A situation of

[1] Some topics that receive comment in this paper are more fully explored in my doctoral dissertation (Richardson, 1998).

reciprocal causation (Stanovich, 1986) sets up in which students with insufficient knowledge of characters and character combinations are unable to effectively read, which, in turn, keeps them from learning, through reading, more of the characters and character combinations they need for reading. Lack of extensive exposure to print has other negative consequences as well (see Chen, 1996, for example). Unfortunately, for CFL students this situation often persists for a very long time. Light (1975, p. 70) may not have been overstating the case when he wrote that for students beginning this process a "long period of unrelieved struggle . . . precedes even a glimmer of bare literacy." Interest in reading Chinese and motivation to continue to invest time toward that end can be understandably difficult to sustain in face of such paltry returns for effort.

Given this situation, professionals involved in CFL teaching have long felt the need to help learners more efficiently learn the characters and more quickly move to literacy in the language (e.g. Light, 1976; Walker, 1984). Among a number of steps taken in recent years to help learners accomplish these objectives is an increasing effort to conduct empirical research on character learning and other topics germane to CFL reading (Everson, 1998, 2002; Ke & Everson, 1999). Everson (2002) states that this is done "with the hope that pedagogical innovation can be derived from the research" (p. 4). Clearly, this effort has yielded valuable insights, but it is also somewhat limited in that it tends not to look beyond experimentation involving CFL students in traditional classroom settings. Conclusions reached for learners involved in such research cannot necessarily be generalized to learners using materials or strategies that are more suitable for non-classroom environments.

In recent years increasing attention has been given to language-education alternatives that involve greater learner autonomy and more out-of-class learning (Benson, 2001). Such self-directed learning in non-institutional contexts could, either by itself or in partnership with learning in more standard contexts, provide some of the needed and hoped-for innovation that will help CFL learners more rapidly move to meaningful literacy. Consideration of the memory strategy principally discussed in this paper, which is almost certain to be unsuitable for the standard classroom, represents an opportunity for broadened thinking, and perhaps useful insights, along these lines. As this strategy involves the use of mnemonics, I will first briefly discuss mnemonics, and then raise and respond to some of the main objections to their use.

Mnemonics and Character Memorization

A well-known approach to the memorization of at least some characters—one that is spontaneously used by many students (Kent, 1993, McGinnis, 1999) and sometimes encouraged by teachers (e.g., Carr, 1981; Mickel, 1981; Ao, 1996, Nov. 5)—involves the use of mnemonic elaboration. This refers to the adding of meaningful connections or additions to arbitrary and nonmeaningful stimulus items to be learned. Speaking generally, and not specifically about vocabulary learning or character memorization, an overwhelming body of scientific evidence has accumulated in support of the idea that if mnemonic elaboration is appropriately done, memory for items to be learned is greatly improved (Higbee, 1988). By the early 1970s it was clear to researchers involved in controlled laboratory experimentation with mnemonics that they often produced strong improvements in recall. Bower's (1973) comments from that time are illustrative:

> There can now be no doubt that deliberate use of mnemonics helps children and adults to learn faster. . . . Many controlled laboratory studies have now shown impressive gains produced by mnemonics [sic] methods in various learning tasks—in paired associates, serial ordering, free recall—with both meaningful and meaningless or nonsense material (pp. 201-202).

In the years since, a large body of rigorously conducted studies involving vocabulary learning and mnemonic interventions has produced researcher assessments that are similarly positive (see Gruneberg & Jacobs, 1991; Levin, 1993; McDaniel & Pressley, 1987; Pressley & McDaniel, 1988). As a result, many academics now accord mnemonics status as legitimate strategies for language learning (e.g., Oxford, 1990; Pincas, 1996). For some scholars, however, the mere mention of mnemonics is highly unpalatable, and triggers an immediate dismissal of everything else to be said. This is understandable for a number of reasons, some of which are relevant to the use of mnemonics in general, and some of which may be specifically related to their use with Chinese characters.

General Concerns about Mnemonics

Among the more important general concerns about mnemonics are the following (see Higbee, 1988, for an extended discussion), together with my abbreviated responses:

- Concern: Mnemonics have been too often associated with disreputable individuals, and too often promoted for disapprovable reasons.

  Response: This is true. The unsavory characters who have peddled mnemonics with exaggerated claims to the effect that "success in life, love, school, and business is the sure-fire sequel of the super-powered memory"—which one can acquire by purchasing a certain product for a remarkably low price—(Bower, 1970, p. 496) do lead one to be distrustful of new claims. Nevertheless, mnemonics have been amply acquitted by empirical science, as mentioned earlier. Wariness about new claims is appropriate, but peremptory dismissal is not.

- Concern: Mnemonics are often too silly and bizarre.

  Response: I confess that I have personally seen mnemonics that seemed so silly that I have wondered if any advantage in recall could possibly compensate for having to think in the terms they suggested (e.g., Higbee and Kunihira, 1985). Still, the nonacademic, unsophisticated nature of some mnemonic strategies—especially in the eyes of those of us who have learned, by other methods, the material with which a particular mnemonic is designed to help—should not be automatic cause for dismissing them as being useless. Other criteria, not the least of which involves the question of how effective a particular mnemonic strategy might be in terms of producing specific learning outcomes, need to be duly considered (Levin, 1986).

- Concern: Mnemonics clutter the mind.

  Response: Aitken (cited in Kilpatrick, 1985), for one, thought so: "Mnemonics I have never used, and deeply distrust. They merely perturb with alien and irrelevant associations a faculty that should be pure and limpid" (p. 65). I have two observations: One is that without mnemonic elaboration the beginning CFL learner often seems to have a memory for characters that is not so "pure and limpid" as it is obscure and turbid. It might be argued that since mnemonics provide organization and meaning that do not exist in their absence, they unclutter, rather than clutter, the mind. A second observation is that mnemonic elaborations seem to fall away as more direct memory links are established through practice (Hulstijn, 1997; Kasper, 1993).

- Concern: Mnemonics represent a low-level activity when compared with the higher mental activities associated with understanding.

  Response: Education unavoidably involves a great deal of memorization. "Any geography student who thinks Minneapolis is in France, or any art history student who thinks Salvador Dali painted the Sistine Chapel is going to flunk his exams" if he makes such mistakes often enough (Bower, 1973, p. 203). Similarly, Bjork (1988) argues that "complex intellectual skills such as language . . . are undergirded by prodigious amounts of rote memorization. Rather than regarding such learning as inferior, we should recognize that it is essential, and we should get on with the job of making such learning as efficient and painless as possible" (p. 400). If this is so, it seems imprudent to ignore the potential of memory strategies on the insistence that they involve

lower-level, mechanical, or non-intellectual activities compared with other kinds of thinking (Pincas, 1996). At the very least, the fact that mnemonics can make possible the more efficient learning of material that *must* be memorized suggests that they can actually free the mind to spend more time understanding, reasoning, and creating (Higbee, 1977).

Concerns about Mnemonics and the Memorization of Chinese Characters

Still, what about the use of mnemonics with Chinese characters? Some CFL professionals strongly object to the use of mnemonics in ways that cannot be justified by existing etymological knowledge, with the principal concern being the attribution of meaning to the phonetics in phonetic compounds. Such explanations have been belittlingly referred to as "far-fetched etymologies" (DeFrancis, 1984, p. 94), "cutesy character derivations" (Moran, 1997, May 28), and even "fanciful etymologies of the 'Gee-whiz school'" (Hansell, 1997, May 28). The essence of the argument against etymologically inaccurate character explanations is made by Baxter (1997, May 29): "I think, on balance, that students shouldn't be told anything about Chinese characters that isn't true. Mnemonic devices are OK as long as they are clearly labelled as such, but why not just tell them the truth? Hansell (1997, May 28) adds that "while cute stories . . . may help beginning learners remember characters, they are seldom labeled as fiction, and are ultimately damaging in the distorted picture of Chinese writing that they give."

One response to these concerns is that no matter how much we would like things to be otherwise, all the facts of historical etymology of which we are aware cannot be said to constitute the *truth* about the characters. Many irregularities and unknowns, as

well as marginal or speculative interpretations, are part of the best knowledge we have about them (DeFrancis, 1984; Taylor & Taylor, 1995). Even if students only learn characters in connection with our most up-to-date etymological awarenesses, it is inevitable that they will pick up some distortions; they will learn some things about the characters that are not true.

Another response is that no matter how accurate our etymological information might be, it might not provide the best means for helping *beginning* students learn what they most need to know about the characters. Few (if any) students start studying Chinese as a foreign language with the intent of becoming etymologists, yet virtually all of them struggle with the burdens the Chinese script places on memory. It seems to me that if the choice is between etymological precision and relief for memory, beginners are more in need of the latter. Baxter (1997, May 29) and Hansell (1997, May 28) are right that truth in labeling is important. If intentional fictions are associated with the characters for strategic learning purposes, students should be made aware of that fact. If this is done, I do not believe that deviations from etymological explanations will result in a "damaging . . . distorted picture of Chinese writing."

In short, objections to the use of mnemonics are understandable, but it seems unwise—especially for those of us who learned characters in more standard ways—to too quickly dismiss their potential helpfulness for beginning non-native learners of Chinese.

A Large-scale Mnemonic Intervention

If mnemonics have shown themselves to be effective for improving memory for arbitrary, nonmeaningful stimuli, and they have, it seems immediately apparent that one

could hardly find a task so appropriate to their services as that embodied in the array of confusing configurations that confronts the uninitiated learner of the Chinese script. A number of controlled studies involving Chinese characters and mnemonics, including several masters theses and a doctoral dissertation, have attempted to learn to what extent this might be so (Chuang, 1974; Ho, 1984; Hu 1989; Kent, 1993; Wang & Thomas, 1992; Yu, 1987). As a set, these studies confirm the idea that mnemonics can have a strong facilitating effect on the learning of characters and their meanings, but the studies are also problematic for several reasons. One is that virtually all of the studies were afflicted with spontaneous control-group elaboration. That is, control groups engaged spontaneously in the kinds of elaboration reserved for experimental groups, perhaps narrowing the differences between mnemonic and non-mnemonic groups, and definitely complicating interpretation of the results. Another reason is that, as some of the researchers suggest, some of the mnemonics provided to experimental groups might have been poorly conceived (e.g., Kent, 1993). A third reason is that these studies employed very limited numbers of rather (sometimes highly) pictographic characters. To the degree that the characters were pictographic, the researchers' conclusions are based upon a selection of characters that is not representative of the Chinese writing system as a whole.

In connection with this latter difficulty, my view is that the intermittent or sporadic application of mnemonic strategies for the memorization of the more pictographic characters will not make much difference in terms of literacy development. If mnemonics are able to truly help, they will need to be capable of doing so in the form of a systematic, large-scale intervention that can be used with any of the characters. To a sophisticated example of such an intervention I now turn.

Heisig's Story

Dr. James Heisig, a philosopher who lives Japan, developed a systematic strategy for memorizing the characters when he first began to learn *kanji* in the 1970s. In brief, his story is this (Heisig 1986): He had already earned a doctoral degree in philosophy from Cambridge University, and had moved to Japan having no knowledge of the language. He took up residence at a language school, but as courses were already in progress he began studying on his own. After working for a month with "a basic introductory grammar," he began to study the *kanji*. He got the basic idea for his approach after spending a few days looking at books on their history and etymology. Before a month was over, working "day and night," as he says, he had learned the meaning and writing of some 1,900 characters, and was satisfied that he would retain what he had memorized. I now quote Dr. Heisig (1986):

> It was not long before I became aware that something extraordinary had taken place. For myself, the method I was following seemed so simple, even childish, that it was almost an embarrassment to talk about it. And it had happened as such a matter of course that I was quite unprepared for the reaction it caused. On the one hand, some at the school accused me of having a short-term photographic memory that would fade with time. On the other hand, there were those who pressed me to write up my "methods" for their benefit (p. 3).

In the end, that is what he did. [2]

Because of his own learning experience and that of "a relatively small number of students" he has directed in the use of his system, Heisig (1986, p. 2) makes a claim that, he admits, raises "more eyebrows than hopes" among experienced teachers: that students can memorize and learn to write the some 2,000 *kanji* in his book, each in association with one of its principal meanings, in four to six weeks—provided that they work on a full-time basis. He makes it clear, however, that "while the method . . . does eliminate a great deal of wasted effort, the task is still not an *easy* one. It requires as much stamina, concentration, and imagination as one can bring to it" (p. 4).

As is apparent, Heisig (1986) separates off the learning of the writing and meanings of the *kanji* from other language-learning tasks—a controversial move, to be sure. He leaves pronunciations for later (Heisig, 1987), and says nothing about character combinations or grammar. He reasons that

> these are all matters that need specialized treatment in their own right. Meantime, remembering the meaning and the writing of the kanji—perhaps the single most difficult barrier to learning Japanese—can be greatly simplified if the two are isolated and studied apart from everything else (1986, p. 5).

[2] Since that time, while working in entirely unrelated fields, Heisig has published numerous books and other aids to systematize the learning of various aspects of the Japanese writing system. Principal among them are that first book, *Remembering the Kanji I*, (1985, 1986, 2003, but published originally in 1977 under a different title), which deals with remembering the meanings and writing of the *kanji*, and which has been translated into French (Maniette, 1998), Spanish (Heisig, Bernabé & Calafell, 2001), and recently German (Heisig & Rauther, 2005); *Remembering the Kanji II* (1987), a systematic treatment of *kanji* pronunciations; and *Remembering the Kanji III* (Heisig & Sienko, 1994), which extends the work of the first tgwo volumes from approximately 2,000 to 3,000 *kanji*.

To my knowledge, Heisig's claims for this strategy have not yet been empirically investigated.

In what follows, I will only be concerned with the part of Heisig's work that has to do with memorization of the meanings and writing of the *kanji*. This part of his work is not yet available for use by learners of Chinese, but an adaptation is in preparation. Heisig's systematization of *kanji* pronunciations probably cannot be reasonably transferred for use in learning Chinese, and will not receive attention here.

The Strategy

What is the nature of the strategy? Very briefly, it is a complex mnemonic intervention that contains elements of all three major areas into which cognitive learning strategies have been thought to fall—elaboration, organization, and rehearsal (O'Malley & Chamot, 1993; Weinstein & Mayer, 1986). To facilitate a more ample discussion of these elements, I will present several examples from the "frames" Heisig uses for introducing *kanji*. I have omitted some explanatory material, as well as stroke-by-stroke demonstrations showing how each character is written. The number to the left indicates the order in which the character is introduced. The word in boldface following the number is the *keyword*, which (unlike keywords in the well-known *keyword method*) represents one of the character's salient dictionary meanings. Words representing components in the "stories" accompanying each character are given in italics. An asterisk indicates a special meaning (to facilitate use in images) given to a character that will be used later as a component in more complex characters. Heisig refers to such components

as “primitives.” Note the ordering of the frames, and be aware that Heisig introduces the character 月, ‘moon,’ not reproduced here, in frame 13.

11. mouth 口 Like several of the first characters we shall learn, the kanji for **mouth** is a clear pictograph. Since there are no circular shapes among the kanji, the square must be used to depict the circle. *****As a primitive, this form also means *mouth*. Any of the range of possible images that the word suggests—an opening or entrance to a cave, a river, a bottle, as well as the largest hole in one’s head—can be used for the primitive meaning.
109. evening 夕 Just as the word **evening** adds a touch of formality or romanticism to the ordinary word “night,” so the kanji for **evening** takes the ordinary looking *moon* in the night sky and has a cloud pass over it.
112. name 名 Perhaps you have heard of the custom, still preserved in certain African tribes, of a father creeping into the tent or hut of his newborn child on the night of the child’s birth, to whisper into its ear the **name** he has chosen for it, before making his choice public. It is an impressive **naming** custom and fits in tidily with the way this character is constructed: *evening* . . . *mouth*. At *evening* time, a *mouth* pronounces the **name** that will accompany one throughout life.

Three other early frames are similarly used to build up to the character 金 ‘gold,’ in frame 269. As a component (primitive) to be used later, Heisig allows this character to take the meaning “not only of *gold*, but any *metal* at all” (p. 108). The characters in frames 112 and 269 then combine as follows in frame 275:

275. inscription 銘

Take **inscription** in the sense of the *name* you ask the jeweler to carve on a *gold* bracelet or inside a *gold* ring to identify its owner or communicate some sentimental message. It will help if you can recall the first time you had this done and the feelings you had at the time.

The Mnemonic Components of the Strategy: An Analysis

As already mentioned, Heisig's system includes components representing all three of the broad areas into which cognitive learning strategies have been thought to fall: organization, elaboration, and rehearsal. The elaborational component of the system, which would usually be considered the most typically mnemonic in nature, actually involves both organization and elaboration. Before examining that component, however, it is important to look briefly at the larger strategic role of organization in the strategy. It involves what Heisig (1986, p. 9) calls "the most critical factor": a particular ordering of the characters for learning purposes.

The Organizational Component

As can be seen from the above examples, the characters are ordered so as to take advantage of the recursivity present in Chinese writing system. The most complex character is obviously the one in Frame 275 (銘), meaning 'inscription.' To learners who have worked through the materials to that point, however, rather than appearing to be an arbitrary jumble of meaningless strokes, it is easily seen to be composed of two recognizable parts, 'gold' (金) and 'name' (名). These two components are recognizable because they have also been built up from previously learned components.

This arrangement, in which subsequently learned characters are always composed of the largest known components embedded or nested within them, appears to confer at least three advantages over learning characters without such organization. First, by focusing on the largest nested components, the number of components that have to be dealt with per character can usually be kept quite low. In fact, most of the more than 2,000 *kanji* Heisig presents are divided into just two components. This actually constitutes a form of chunking, which is known to increase one's ability to remember in general (Higbee, 1988), and which has also been said to help store the word forms necessary for rapid word recognition in reading (Ehri, 1995). Second, such an organization assures that every new character is made up of components that already constitute meaningfully integrated parts of the learner's prior knowledge, setting up conditions that are known to have the potential to benefit learning (Schallert, 1982, 1991). Third, it assures that those characters and character components that are nested into more complex characters are automatically reviewed. This is a rehearsal element that is additional to the more standard rehearsal component to be discussed later.

The Elaborational Component

A second major strategic component of Heisig's method involves elaboration, which is widely discussed as being of importance to effective learning (e.g., Bransford, Stein, & Shelton, 1984; Levin, 1988; Shuell, 1988; Weinstein & Mayer, 1986). Again, elaboration involves the learner's creation of "meaning enhancing additions that improve . . . memory for what is being learned" (Levin, 1988). Elaborations can be either imaginal

or verbal in nature, and although people differ in terms of their inclination to use them virtually everyone is capable of producing them (Levin, 1988; Shuell, 1988).

One way to explain the underlying cognitive processes involved in the elaborational component of Heisig's strategy is in the terms of an analysis by Bellezza (1981; 1987). Bellezza differentiates between organizational mnemonics and encoding mnemonics. These two classes of mnemonic devices "reflect the two main activities of human memory: unitizing and symbolizing" (Miller, 1956, cited in Bellezza 1987, p. 35). The latter, encoding mnemonics, are primarily intended to "recode new information so it becomes more associable" (p. 263). Organizational mnemonics, on the other hand, "have the primary purpose of unitizing information into some connected whole in memory so that it can be better retrieved" (1981, p. 256). Both types of mnemonics use what Bellezza refers to as "cognitive cuing structures" (1981), or "mental cues" (1987). He explains that "encoding mnemonics ensure that a mental symbol exists for the items of information being memorized, and organizational mnemonics organize these representative symbols in memory. Furthermore, when these symbols are later recalled, they act as mental cues for the items to be remembered" (1987, p. 36).

Frame 275 above, 'inscription' (銘), can be used to demonstrate how this analysis might be applied to Heisig's strategy. Provided that characters presented in earlier frames have been adequately learned, the character 銘 can readily be seen to be composed of two components (金, 名), meaning 'gold' and 'name,' respectively. These two characters have *already* been encoded; that is, rather than being simply two sets of strokes or stroke combinations, they are associated with mental symbols that meaningfully connect them to the learner's prior knowledge. Those mental symbols may be verbal in nature (the words

'gold' and 'name') or, as Heisig strongly prefers, imaginal (the images the learner associated with the characters when they were presented). Assuming that the learner has created the appropriate mental images for 'gold' and 'name,' following Heisig's stress on the use of imagery rather than words, those images still need to be associated with each other *and* with the character's definition: 'inscription.' Such a task, the meaningful unitizing of information that is essentially unrelated, is the province of an organizational mnemonic, as already explained. Heisig accomplishes this by creating a "story." Its purpose is to encourage the elaboration of an interactive image that serves as the organizational mnemonic needed to bring the various elements together meaningfully. In this way, the elements are "nested" into a meaningful interactive image (Bellezza, 1987). In the case of Frame 275, a learner can follow the direct retrieval path that has been created from 銘 to images of the two components ('gold' and 'name'), and then to the organizational image relating them with the character's keyword definition ('inscription').

Offering hints and guidance along the way, Heisig gradually limits himself to providing component encodings, and turns over the elaboration of stories to the learner.

The Review Component

The third major strategic component of Heisig's strategy involves review, or rehearsal, in two basic sub-components. The first is the automatic rehearsal of character elements and characters that are nested within other characters due to the organizational structure of the system, as already discussed. The second is review with flashcards, so that characters can be studied in randomized fashion. Along with specific instructions

about how these flashcards can be made, Heisig clearly spells out how learners should use them (1986, pp. 41-42, 95-97). Perhaps the two most emphasized instructions he gives are that (a) learners should *always* review from keyword to *kanji*, and not vice versa, and (b) learners should always study with a pad and pencil.

Backward Recall

By insisting on review from the keyword definition to the *kanji*, Heisig emphasizes what is often called *backward* (or *productive*) *recall*. In *forward recall*, learners begin with a foreign-word stimulus and proceed to recall its native-language definition. In backward recall, the direction is reversed. Learners begin with a native-language definition as the stimulus and try to recall the foreign word. In the learning of new characters, backward recall can be expected to be more difficult than forward recall due to the newness of component shapes, but with Heisig's strategy they should be entirely recoverable; the mental cues necessary for such a recovery are systematically constructed during the encoding process. One assumption of this emphasis is that if learners can successfully accomplish the harder backward task, the forward task from character to the native-language definition will not cause any difficulty (Heisig, 1986).

Writing the Characters

Heisig (1986) suggests that as a final review step—the last of six—in the learning of each character the learner should write the character once while retelling its accompanying story (p. 95). This adds a motor element to the learning, although this element is a minor one when compared with the repeated writing that is part of character

learning in China and Japan. Heisig makes it clear that while he *does* want learners to pay attention to the writing of the characters (p. 95), he does not want them to use repeated writing as a technique for memorizing:

> There is really no need to write the kanji more than once, unless you have trouble with the stoke-order and want to get a better "feel" for it. If a kanji causes you trouble, spend time clarifying the imagery of its story. Simply rewriting the character will reinforce any latent suspicions you still have that the "tried and true method" of learning by repeating is the only reliable one—which is the very bias we are trying to uproot. (p. 42)

During later randomized review with flashcards, learners also write the characters. When review starts with a native-language definition and proceeds backward along the retrieval path to the character, writing the character gives a clear indication of how well it has been recalled. It also seems, however, that this motor element can make a contribution to character memorization and recognition, as many scholars have suggested (e.g. Hoosain, 1991; Venezky, 1984).

Beyond Cognitive Considerations

One well known classification system for language learning strategies divides such strategies into three categories: (a) *metacognitive* strategies, which include planning for, monitoring, and evaluating learning; (b) *cognitive* strategies, which "operate directly on incoming information, manipulating it in ways that enhance learning"; and (c)

social/affective strategies, which involve interactions with other people, or attempts to control affect in ways that aid learning (O'Malley & Chamot, 1990; also Chamot & O'Malley, 1994). Of these three, Heisig's strategy is mostly cognitive in nature, as already discussed. Still, metacognitive and affective factors do interact in important ways with cognitive factors during learning (Shuell, 1988), and their implications need to be considered if one is considering use of a system such as Heisig's.

Metacognition

It is important to recognize that strategic thinking involves more than simply engaging a particular strategy, no matter how well conceived it might be. A strategy needs to be appropriate to one's goals, capacities, and task (Alexander, Schallert, & Hare, 1991; Schallert, 1991). In this regard, Heisig's system is not only a cognitive strategy, but also an embodiment of his metacognitive awarenesses. It is apparent, for example, that his goal was to learn all of the some 2,000 general-use *kanji*. His awareness of this goal, undoubtedly in concert with other metacognitions about himself as a learner, his task, and his strategic options, resulted in the ordering that he considers to be so important to the system: "If one's goal is to learn . . . the entire list of general-use characters, then it seems best to learn them in the order best suited to memory, not in order of frequency or according to the order in which they are taught to Japanese children" (1986, p. 10). Other features of the system similarly tie back to their originator's metacognitions. What is important for other learners who might use such a strategy is that it needs to make strategic sense for *them*. For learners whose goals and capacities are not compatible with

the awarenesses that guided the system's creation, it would not represent an appropriate option.

Heisig provides learners with frequent metacognitive reminders, encouraging them to monitor and evaluate their images, stories, keyword distinctions, and so forth. These reminders seem to be principally intended to help learners assess their management of the task of accomplishing their goals. They are also likely to have the effect of combatting strategic drift (Perkins, 1985); of assuring that learners do not unmindfully stray from the principles of learning upon which the system is built.

Affect

We know that learner interest and motivation are of great importance to learning (e.g., Alexander, 1996; MacIntyre, 1994; Tobias, 1994). Wixson and Lipson (1991), for instance, assert that "motivation *can* and *does* influence cognition" (p. 555), and Hidi (1990) argues that interest is the primary factor determining what information will actually be cognitively processed. If "intellectual functioning depends on the energizing role that affectivity plays" (Hidi, p. 549, referring to Piaget, 1981), interest and motivation are important in helping provide that energy. This seems to be especially true if the material to be learned is going to require long-term study (Linton, 1988), as Chinese does. Yet the word "excruciating" (Ao, 1996, November 5; Hsia, 1956), has been used to describe the process of character learning, suggesting a quality of negative affect that certainly seems capable of making interest and motivation difficult to sustain.

Important in this regard is the fact that mnemonic elaboration has often been found to be associated with positive affect, undoubtedly in part because it has helped

learners succeed at the learning tasks involved. Bransford, Stein, and Shelton (1984), for example, in connection with a study involving fifth-graders and sentence elaboration, note that "the most interesting data involved [the children's] excitement and pleasure; a task that had initially been extremely difficult became very easy to perform" (p. 42). Similarly, interest, motivation, and enjoyment have been found repeatedly in connection with the keyword method and other mnemonics used by adults (Coady, Magoto, Hubbard, Graney, & Mokhtari, 1993; Higbee, 1990; Kasper, 1993). Hulstijn (1997), in fact, concludes a discussion on mnemonics in second language vocabulary learning with the comment that "to some extent they [mnemonics] can transform the vocabulary learning task from uninspired drudgery into newfound delight" (p. 220). Heisig (1986), unquestionably intends to elicit such positive affect, as he wants "to get you close enough to the characters to befriend them, let them surprise you, inspire you, enlighten you, resist you, and seduce you" (p. 11).

Literacy Development

Eventually, it is important to ask what all of this has to do with reading. One cannot just string morphemic translation equivalents together and call that reading. A truly adequate treatment of the topic would benefit from an extended discussion of such subjects as word recognition, lexical access, automaticity, acquired modularity (information encapsulation), and so forth. Here, the discussion will, of necessity, be much more brief.

Word Recognition

A large and diverse body of first language (L1) experimental evidence and theoretical work involving English shows that word recognition (word identification) skills are critically important to skilled reading (e.g., Ehri, 1991, 1995; Gough, 1984; Henderson, 1992; Juel, 1995; Perfetti, 1995; Stanovich, 2000). This is due, at least in part, to the well established awareness that reading is heavily dependent upon available visual information (Stanovich, 1991). Furthermore, due to "apparently general constraints of human information processing" (Perfetti, 1986, p. 36), these skills are just as indispensable for nonalphabetic systems as they are for alphabetic ones. This applies to second language (L2) reading as well (Chikamatsu, 1996; Everson, 1994; Koda, 1996).

Lexical Representations and Alphabetic Languages

According to Perfetti (1986, 1991, 1992; Perfetti & Hart, 2001) and similarly-minded theorists, efficient word recognition requires the establishing of high-quality lexical representations in memory. Such representations are essentially detailed knowledge about the orthographic, phonological, and semantic constituents of a word's identity. Perfetti and Hart (2001) explain that "high-quality representations are what drive rapid processing. More importantly, they are responsible for automaticity (or at least efficiency) of word identification, which is what allows processing resources to be devoted to higher level comprehension" (p. 76).

Perfetti (1991, 1992), focusing on the orthographic and phonological representations in an alphabetic language, explains that representational quality is characterized by *precision* and *redundancy*. The precision he speaks of is critically

related to orthography in that a precise representation is one that is fully specified in terms of its spelling. Such a representation cleanly matches a particular string of letters that may be seen during reading, assuring that the appropriate word is quickly recognized, rather than any of the many other possibilities. In other words, "because the graphic representation has no 'holes' in it, it can be triggered by graphic input in a totally deterministic way" (1992, p. 162). As precision increases, word representations exhibit greater and greater redundancy, meaning that redundant connections (sources of information) become available to aid recognition. This happens in the lexicon through the strengthening of letter-sound connections at the subword level and the bonding of orthographic and phonological representations at the word level. These are parallel developments, on two different levels, which (a) "allow multiple parallel processes to aid rapid recognition" and (b) "provide fall-back routes to identification when one information source is impoverished or noisy" (1991, p. 37).

The key measure for determining representational quality is spelling, which is most clearly tied to the precision principle. In general, difficulty with spelling indicates unreliable or imprecise representations in memory. On the other hand, "reliable, confident, and facile spelling is an index of high quality representation" (1992, p. 163). In this view, then, perception and production (reading and spelling) share the same lexical representation. The quality of representation needed for spelling is, of course, higher than that needed for reading (Perfetti, 1997).

Perfetti has a good deal of well-informed company for many of these ideas (e.g., Ehri, 1991, 1992, 1995; Henderson, 1992; Stanovich, 1990, 1992, 2000). Ehri, for example, argues for a conceptualization of *sight words* that is highly compatible with

Perfetti's views. When "sight of the word triggers that word in memory, including information about its spelling, pronunciation and meaning," it is a sight word (Ehri, 1995, p. 117). Like Perfetti, Ehri (1992) claims that such words accumulate in memory; that spellings, pronunciations, and meanings bond, or amalgamate, and that these amalgamated identities (representations) are accessed directly from their printed forms. She also states that mature "readers . . . retain complete information about the spellings of sight words in memory" (1995, p. 121). In this she is in agreement with Perfetti that reading and spelling share the same lexical representation, a perspective that is also held by many other investigators (e.g., Gill, 1992; Gough, Juel, & Griffith, 1992). Along these lines, Stanovich (1992) cites the work of L1 investigators who argue from studies of spelling performance that some readers may not develop precise orthographic representations because they fail to pay equal attention to all the letters in the words they read, particularly ignoring those that occupy the middle and final positions. He also refers to the suggestion made by some researchers that phonics instruction may be effective in part because it forces attention to the interior details of words, "thus facilitating the development of accurate orthographic representations" (p. 320).

Lexical Representations and Chinese

I can see no reason for believing that knowledge of the details of word spellings and structure would be important to the establishment of precise orthographic representations in alphabetic languages while the details of character composition should be unimportant for Chinese. Perfetti (1986) acknowledges that the architecture of a representation system for Chinese cannot be the same as that which serves English, or

any other alphabetic system. Chinese does not have grapheme-phoneme correspondence (GPC) rules, so phonological information is not represented graphically—not "embedded in the graphemic representation" (Koda, 1995, p. 313)—in the same compositional way that it is in alphabetic systems. Phonetic elements *do* appear in many characters, of course, but in addition to being unreliable, they are, as Koda comments, usually characters in their own right. This means that their phonological values are retrieved through memory search, just as such values are retrieved for any whole character in the system. The significance of this for the lexical representation system is that the precision of the orthographic representation seems to be even more important for Chinese than for English, since the kind of GPC-related redundancy that is available in alphabetic languages is not available in Chinese. Hence, Wang, Perfetti, and Liu (2003), for example, endorse a model of lexical constituency that "emphasizes the importance of a fully specified [precise] orthographic representation prior to the activation of phonological and meaning information in reading Chinese" (p. 187).

If facility with spelling is the best indicator of such representational quality in alphabetic languages, is it possible to say something similar for Chinese? Perfetti (1997), considering what might constitute spelling in Chinese, says that "it is possible to suggest that Chinese spelling, as in an alphabetic writing system, is a matter of providing written word constituents, whatever the psychological source of these constituents might be" (p. 28).

Such 'spelling' is obviously one of the things Heisig wants to enable beginning learners to do. His insistence that rehearsal proceed from keyword to character means that learners cannot get away with ignoring a character's internal details and structure,

because those features have to be produced in a written character as part of the rehearsal procedure. The result is an orthographic representation of a quality that goes beyond that needed for recognition alone (see Ke, 1996). On this account, then, as learners use stories and the strategy's other procedures to build up memory for characters, starting with the simple and moving to the complex—always focusing attention on character components—they systematically, and presumably in accelerated fashion, build up important aspects of the "orthographic awareness" needed for reading (see Jackson, Everson, & Ke, 2003, for Ke's model of orthographic awareness).

Practical Questions, Hypothetical Considerations, and Increasing Print Exposure

Of course, much more than an initial orthographic knowledge of single characters—even if it is high in quality and connected with a serviceable meaning—is needed for reading in Chinese. Character pronunciations, nuanced semantic knowledge, awareness of character compounds, and more, are all essential to the process. Still, if Heisig's strategy, or some other well-conceived mnemonic system, were shown to be capable of helping CFL learners memorize the writing of some 2,000 Chinese characters, each in association with a salient meaning, in less than two months of full-time study—and be confident, as Heisig says he was, that they would not forget what they had learned—it certainly seems that accelerated literacy development could be possible. How such learning might actually be incorporated into the larger project of learning to read Chinese, or the still larger project of CFL learning in general—especially when they involve regular classroom settings—is uncertain. Heisig himself (Heisig & Sienko, 1987, pp. 7-8) has said that his strategy not suitable for standard coursework

It can be important that we be willing to look for answers outside of prevailing paradigms, as the effective innovations we need and seek may not be found unless they are sought in unexpected places. In that spirit, let us return to Heisig's (1986) story. He says that he memorized the writing and meanings of the *kanji* he learned, during that month in which he studied them, while working on his own—"against the advice of nearly everyone around [him]" (p. 3)—and before enrolling in any courses at his school in Japan. If character learning is "largely a self-contained task" in that "very little of the knowledge users have of the language itself can be applied" (Hannas, 1995, p. 251; also see Ke, 1998, in which heritage learners showed no advantage over non-heritage learners in character recognition and production), perhaps at least some CFL learners could reasonably follow a similar pattern. They might begin CFL study by using effective mnemonics on an independent (or semi-independent) basis to systematically and rapidly acquire the writing and meanings of a large body of high-frequency characters, and *then* begin the study other aspects of the language in a more standard educational setting. For many professionals, such an approach will not be philosophically appealing, given (a) the frequently mentioned primacy of spoken language (Dew, 1994) and (b) the arguments that exist for delaying character learning, at least in classroom environments (Packard, 1990), but it could have advantages for learning purposes.

Consider a hypothetical introductory Chinese course taken only by learners who have previously followed Heisig's strategy for some six weeks and found his claims to be accurate—meaning that they know the writing and basic meanings of some 2,000 high-frequency Chinese characters. One can imagine, among other things, that (a) the teacher could responsibly spend more classroom time than usual on listening and speaking skills,

as many teachers wish to do (see Lin, 2000, p. 86; Yang, 2000); (b) the teacher could, from the beginning, point out and emphasize the contribution of phonetic elements (for which the learners would already have well established orthographic knowledge); (c) the learners should find it much easier than normal beginners to map Chinese pronunciations to characters, as they would not be tying syllables to incomplete and evanescent character knowledge, but to high-quality orthographic representations; (d) the learners should be able to approach vocabulary lists with greater confidence than is usually possible, and enjoy discovering the relationships that usually exist between the individual morphemes (which they will already know) and the compound words of which they are a part (Richardson, 1998); (e) the learners should be able to handle not only greater amounts of vocabulary than standard beginners, but also higher-level, more authentic, and more extensive reading in connection with that vocabulary. In fact, much of the out-of-class time normally spent on character memorization might be given to such reading. This increased exposure to print would, in turn, provide the practice necessary to further increase the representational quality of characters and compounds in the learners' lexicon, and help develop the automaticity needed for truly skilled reading (Perfetti, 1992). Many other advantages would accrue as well. In the end, such a group of students would probably need a course sequence that is more advanced in significant ways than what is currently the norm.

Conclusion

John DeFrancis's response to all of this might be: "This sounds like another 'quick-literacy nostrum,' another 'get-literate-quick scheme,'" phrases he has used in the

past to describe another attempt to improve character learning in Chinese (see DeFrancis 1984, pp. 206, 213). He may object that Heisig's strategy is a variation on the "Peking Duck approach to character study—a combination of forced feeding with little exercise—[that] leaves the student with an acute case of indigestion at about the 1500 character level" (1966, pp. 14-15). In the absence of confirmation of the strategy's effectiveness through appropriate testing, such perspectives could certainly be accurate.

Nevertheless, in the nearly 40 years since DeFrancis (1966) wrote about the process of reading Chinese itself as being essential to learning to read Chinese, and suggested limits on character learning and increased use of limited-vocabulary texts as the way to help learners read more, advances in our knowledge of vocabulary development and reading processes have combined to suggest new possibilities. Today, leading researchers on L2 vocabulary learning emphasize not vocabulary control, but the initial rapid learning of a large vocabulary consisting of high-frequency words (e.g., Coady, 1993; Huckin & Haynes, 1993; Meara, 1995; Nation, 2000). This is due at least in part to the awareness that skilled word recognition, with its requirements for high-quality word knowledge, is now known to be centrally important to skilled reading. It is also partly due to the fact that after more than two decades of greatly intensified research on L2 vocabulary (Bogaards & Laufer, 2004), we now know much more than before about the acquisition of vocabulary knowledge, including why legitimacy can now be appropriately accorded to mnemonics for purposes of vocabulary learning (e.g., Cohen, 1990; Hulstijn, 1997; Meara, 1995).

None of this contravenes DeFrancis's (1966) insistence that CFL learners need to do more reading, which, if we can extrapolate from the L1 research in English, has been

interestingly and amply supported by empirical work in recent decades (Stanovich, 2000). It does suggest, however, that a large-scale strategy involving recursive mnemonics, like Heisig's, could help at least some CFL learners more effectively deal with the memory burden imposed by the Chinese script, allowing them to meaningfully read earlier and more extensively than is usually thought possible. Levin (1988) has stated that "to date, researchers have barely scratched the surface of . . . mnemonic strategies' educational potential" (p. 200). Perhaps it is time to dig deeper into what such strategies can do to help learners of Chinese.

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