A qualitative inquiry of character learning strategies by Chinese L2 beginners

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Previous research in Chinese character learning strategies has shown that students tend to rely on the mechanical copying and mindless memorization of characters, especially before they acquire enough characters to allow them to use the knowledge of Chinese radicals effectively. The aim of this study is to describe actual mnemonic methods and learning strategies used by first-year Chinese language students. For a period of one semester, 50 Czech university students were asked to keep records of mnemonics used to memorize individual characters. Qualitative data analysis reveals the types of strategies they applied. Strategy content analysis has identified ten frequently-used basic strategies, including Story, Radical, Imagination, Component Comparison, Word, Similarity, Drawing, Emotion, Etymology, and Pronunciation. These strategies are used either independently to elaborate a single piece of information, or in combinations, interweaving two or more pieces of information into one. Strategies show the students’ tendency to analyze characters into components, name individual components, and focus on graphic and semantic information, while omitting the phonological information.

Keywords: Chinese characters, learning strategies, radicals, Chinese L2 beginners

1. Introduction

Chinese is rated as one of the most difficult languages for Western learners, with Chinese characters, grammar, tones, and a lack of cognate words being among the main reasons. While tones can be mastered within a few weeks and grammar within a few months, characters remain an effort-consuming task forever. The study of Chinese characters requires not only a considerable amount of time, but also good memorization techniques and learning strategies. The learning of Chinese characters is a double-edged sword in the study of the Chinese language.

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On the one hand, it is often the “mysterious script” that attracts new students and motivates them to learn Chinese; on the other hand, Chinese characters are often perceived as the most difficult task in learning Chinese as a foreign language, especially for non-character background learners. Memorizing characters is a timeconsuming and effortful task, which in many cases easily leads to disillusionment and student attrition (Walker 1989; Wen 1997).

2. Literature review

The Chinese writing system as a logographic script differs from alphabetical scripts in many aspects, such as the number of characters that are used in communication. While the number of letters in alphabetic scripts is very limited, the Chinese writing system operates with over 50,000 characters, out of which roughly 3,000–4,000 characters are considered to be necessary for ordinary literacy (Norman 1988). The large number of items results in a slower learning process with high demands on memory. Second, individual characters are not pure phonological representations of language as in alphabetical scripts. Each character carries a specific meaning and represents one syllable (apart from a few exceptions). Even though over 82% of Chinese characters also carry phonological information, the accuracy of that information for modern Chinese is only 26% (Shao 2007). Third, the graphical structure of Chinese characters is very complex. The basic unit of the character is the stroke. There are 31 stroke variations identified in Chinese and each is written in a prescribed direction. Frequently-used Chinese characters comprise an average of 8 strokes, but the most intricate characters have up to 64 strokes (Qian 2002; Shao 2007). Strokes are composed into components, most of which carry phonetic or semantic information. There are roughly 600–700 components. In handwriting, components have a given stroke order, and combine to form characters in a given order. Knowledge of the stroke order must be memorized by beginning learners and gradually becomes automatic as the components reoccur in new characters. When learning a new character, learners need to memorize its graphical structure, pronunciation, meaning, and its usage in polysyllabic structures or sentences. The goal is to unite all four pieces of knowledge in the recognition and production of each character. Hayden (2005) describes three successive processes related to learning Chinese characters: retention, recognition, and production. Retention refers to the process of memorizing characters and includes specific techniques such as mnemonics. Recognition refers to the successful retrieval of information from long-term memory, including the retrieval of pronunciation and meaning. Production then refers to the advanced ability of not only being able to recognize the character, but also to reproduce it.

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The retention process can vary in depth, as suggested by Craik & Lockhart (1972). The Depth of Processing hypothesis distinguishes between “shallow processing” and “deep processing,” where the depth implies the degree of semantic or cognitive analysis, or the degree of elaboration of encoding (Lockhart & Craik 1990). The extensiveness of elaboration is supposed to have a positive influence on long-term memory performance. In terms of Chinese character retention, “shallow processing” refers to the mechanical copying of characters. Once the copying is accompanied by the elaborative processes of component analysis, such as connecting the meaning of the components with the meaning of the character, comparison, grouping, or any other cognitive process, more semantic connections are created, which can improve both recognition and production. Chinese language teachers, therefore, have been searching for various innovative techniques for teaching characters, trying to make the learning process less effortful, better structured, more interesting, and mutually interconnected. Methods for teaching Chinese characters range from zero instruction to a strokeoriented and etymology-oriented approach, which provides detailed descriptions of characters’ structure and etymology (Chu 2006). However, the time dedicated to characters themselves in the classroom is very limited and courses focused on characters are usually offered for first-year students only, if at all. The actual task of memorizing characters relies on individual out-of-class activity, be it rote repetition of characters, reviewing of flash cards, text composition, or any other character-related activity. Therefore, more attention tends to turn towards the learners’ approach to the learning task. New questions arise, such as: Do students use etymology or the structural knowledge of Chinese characters in the learning process? Do they rely on traditional rote repetition or use mnemonics to memorize characters more efficiently? To improve the outcomes of their learning activity, students adopt numerous techniques and strategies. Language learning strategies were first brought to discussion in the 1980s (Naiman, et al. 1978; Rubin 1981). In the 1990s, further analysis and classification of learning strategies were conducted by Oxford (1990), O’Malley and Chamot (1990), Stern (1992), and other researchers. By definition, learning strategies are “operations employed by the learner to aid the acquisition, storage, retrieval, and use of information […], actions taken by the learner to make learning easier, faster, more enjoyable, more self-directed, more effective, and more transferrable to new situations” (Oxford 1990: 8). Learning strategies are generally divided into cognitive and metacognitive strategies. In terms of Chinese character learning, cognitive strategies consist of mental activities related to attention, perception, memorization, comprehension, and retrieval of characters, while metacognitive strategies consist of reviewing, monitoring, planning, assessing, and evaluating the learning activity (Shen 2005: 56).

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Chinese character learning strategies have already been analyzed by numerous researchers (Jiang & Zhao 2001; Ke 1998; McGinnis 2000; Shen 2005; Tseng 2000; Wang 1998; Yeh 2001). In 1994, McGinnis (2000: 160) used self-assessment forms to analyze character learning strategies used by elementary CFL (Chinese as a foreign language) students engaged in a short term summer immersion program. The results showed a high inclination for repetitive writing and creating idiosyncratic stories. Among other strategies, the use of radical/phonetic components, repetition through writing or reading, and flashcards were also mentioned. Ke (1998) investigated 150 first-year CFL students and their attitudes toward various character learning strategies. The questionnaire included 11 statements comparing pairs of strategies in terms of their effectiveness. Students were asked to mark whether they agreed or disagreed with these statements. Data analysis indicated the students’ preference for learning components, learning by rote, and practicing characters in the context of a word, while learning phonetic components was rated as least useful. When learning preferences were compared to students’ performance, strategies used by students with the highest scores included practicing characters in context, noticing similarities between new characters and characters already learned, and using radicals to learn characters. Wang (1998) conducted a ten week qualitative study on the teaching and learning of Chinese characters in First-year, second-semester Mandarin classes in the USA. Wang used a questionnaire of 20 yes/no questions to investigate learners’ attitudes and strategies. The results revealed that 93% of students memorized characters, yet 53% did not expect to remember them after memorization. Furthermore, 44% of students used the repetitive copying method, 18% would look for familiar shapes or ideas, and 20% would categorize characters into groups. Jiang & Zhao (2001) based their Chinese character learning strategies research on previous character learning inventories (Ke 1998; McGinnis 2000) and Oxford’s Strategy Inventory for Language Learning (1990). Their questionnaire research was conducted on 136 students of various nationalities at the Beijing Language and Culture University. Out of 48 measured strategies, 6 cognitive and 2 metacognitive strategies were identified as the most frequent. Cognitive strategies included: (1) graphic strategy — learning characters as whole units via rote repetition; (2) phono-semantic strategy — paying attention to pronunciation and meaning; (3) stroke order strategy; (4) reviewing strategy; (5) application in real life strategy; and (6) generalization strategy — looking for similarities in graphic, phonetic and semantic properties of characters. Metacognitive strategies included planning and monitoring the outcomes of learning. The most profound study was conducted by Shen (2005), in which 95 students of various CFL levels engaged in a three-stage research project. First, students described their learning activity by answering 12 semi-structured questions.

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Collected data was summarized into a 59-strategy questionnaire and the frequency of student usage for each of the strategies was measured with a five-point Likert scale. In the third questionnaire, students were asked to rate the usefulness of commonly employed strategies. Out of the 30 most frequent strategies, 25 cognitive strategies were further analyzed through factor analysis, which revealed that students use cognitive strategies that (1) require orthographic knowledge as cues in memorizing new characters, (2) create mental linkages among sound, shape, and meaning of the character by repeated exposure to all three elements, (3) use both aural-oral cues and writing in receiving and encoding information about new characters at the initial stage, (4) emphasize the use of sound as cues to make connections to meaning and shape within a character, and (5) seek various avenues to understand the syntactic functions of new characters. (Shen 2005: 59) As for research tools, questionnaires appear to be the most frequently used quantitative tools for investigating learning strategies. As the literature overview shows, researchers apply a top-down approach and ask students to summarize the learning strategies they use, or choose among strategies in a list. In the next step, strategies are categorized by frequency, commonalities, or subjective effectiveness, and statistically interpreted. Another approach to identifying strategies would be bottom-up qualitative research that would follow the students in their learning process and build up the database on actual strategies used for individual characters. The qualitative approach was applied by Bourke (1997) in her analysis of kanji learning strategies used by a small group of Australian students of Japanese. In the first stage, Bourke used think-aloud protocols and interviews to trace the detailed cognitive processes engaged in learning kanji. These strategies were then described and summarized into a Strategy Inventory of Learning Kanji (SILK), which categorized strategies as either direct (cognitive) or indirect (metacognitive). Direct strategies included the following subtypes: associations, stories, radicals, frequency, experience, visualization, self-monitoring, compensation, sequence, physical/ emotional response, sound, and stroke order. Indirect strategies were related to planning, evaluating, and cooperating with others. Each of these subcategories included a list of specific strategies with examples given by respondents. Most of the studies focusing on Chinese characters apply the quantitative approach and focus on comparing the frequency of usage of various strategies; the literature seems to include very little investigation of the learning process itself by qualitative measures. Qualitative research focused on the process, rather than the result, could provide more details on the actual construction of the learning strategies and reveal the mental process of learning characters.

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The aim of this study is to offer bottom-up insight into Chinese character learning strategies, and to fill in the missing contents of strategies described in the previous studies through a qualitative analysis of retention techniques. To avoid individual preferences in learning that would influence the results, the study was conducted on a large group of students for an extended period of time. At the same time, the scope of the study is limited to retention techniques related to memorizing characters only. The research aims to answer the following questions: How do students process the teaching material presented to them and memorize individual characters? Do they apply component analysis, or use semantic and phonetic radicals or etymology to memorize characters?

3. Procedure

The research group consisted of 56 first-year students of the Chinese language undergraduate program at a public university in the Czech Republic. The research proceeded during the second semester of their studies. By the end of the first semester, students had acquired a basic knowledge of Chinese character structure, etymology, stroke sequence, and character writing principles, and had studied 250 Chinese characters. In the second semester, 259 new characters were introduced. The textbook used in both semesters provided details on each character’s stroke order, pronunciation, meaning, type (pictogram, ideogram, phonogram, etc.), components, and etymology. Out of each 90-minute class, 30 minutes were spent on the presentation of new information to students, 30 minutes on reading and translating text based on characters from the previous lesson, and the remaining 30 minutes were spent on review and exercises. New characters were introduced during class one by one, with ample information: First, the stroke order of a simplified character was demonstrated on the blackboard, and its pronunciation and meaning were explained. Then the etymology of each character was presented: its original meaning and liushu classification, as well as its components (phonetics and radicals) were pointed out. The character’s traditional version was also written on the blackboard. Lastly, words containing the character were listed. During the review portion of the class, students practiced writing dictated words and sentences on the blackboard or completed the exercise in the textbook. The instructional strategy of the first semester differed only in its presentation of stroke order rules, which included the directions of individual strokes and structural composition of the character (left-right, top-bottom etc.). As a weekly assignment for the second-semester Chinese Character class, students were asked to copy four lines of each of the learned characters into a prescribed homework sheet. For each character, students were also asked to describe

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any strategy that helped them memorize it. The character-copying exercise was a required assignment; the strategy part was voluntary — to prevent students from thinking up irrelevant strategies only for the sake of fulfilling the assignment. At the beginning of the semester, a group discussion on Chinese character learning strategies was conducted to raise the awareness of individual differences in learning and the benefits of deeper processing in contrast to mechanical memorization. The strategies described by the students were collected weekly, and typed and shared anonymously on a course web platform, so that the students could observe strategies used by their classmates. It was emphasized that understanding the learning process is first of all beneficial for the students themselves. Students were also encouraged to look up strategies used by their classmates, especially in the case of characters that they found hard to remember. Apart from recording learning strategies devoted to the writing, pronunciation, and meaning of individual characters, students were also asked to keep a weekly record both of characters that were very easy and of those that were very difficult to remember, of time spent on practicing characters, and general review strategies. Homework sheets also offered space for communication with the teacher, in the form of general feedback, suggestions, or questions.

4. Data analysis and results

At the end of the semester, valid data were obtained from 50 students, including 2,319 strategies describing ways of memorizing individual characters. The number of strategies per student varied considerably (n = 50, x̄ = 46.4; Md = 22): 7 students heavily relied on strategies, noting down strategies for 100–186 characters (out of a total of 259 characters, which means roughly every second character), 12 students identified strategies for 50–100 characters, 15 students marked strategies with 10–50 characters, and the remaining 16 students indicated fewer than 10 strategies (see Table 1).

Table 1. Number of characters with strategies per student Number of characters with identified strategy Number of students Percentage % fewer than 10 16 32% 10–50 15 30% 50–100 12 24% 100–186 7 14% total 50 100%

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On average, each character was described by 8.9 students (n = 259, x̄ = 8.9, Md = 8). There was no correlation between the number of strokes in the character and the number of strategies used by students (r = 0.009). There did not seem to be a tendency for students to use a greater number of strategies for more graphically-challenging characters. According to the students’ records of time spent on writing homework and practicing characters, the average time spent on learning Chinese characters varied between 3 and 10 hours per week. Throughout the semester, the group mean showed a slightly decreasing tendency in average learning times, from initial highs of 6.3 hours per week to 5.5 hours in the last week (see Table 2).

Table 2. Average time spent on practicing Chinese characters throughout the semester

0

2

4

6

8

1 2 3 4 5 6 7 8 9 10 Strategies were analyzed in terms of their contents and usage frequency. Coding of individual items was undertaken by two raters with the inter-rater reliability reaching 84%. Coding discrepancies in categorization were discussed and resolved. The strategy content analysis shows that basic strategies are limited in number, but form a large number of combinations. First, ten basic strategies are identified and described in detail and strategies with a total frequency lower than 1% are briefly summarized at the end. These strategies are used either independently or in combination with other strategies. Second, combinations of strategies are listed. Both basic and combined strategies are listed in order of their frequency of usage. For an easier interpretation of strategies, /meanings/ of characters are marked with slashes, names of <radicals or components> are marked with angle brackets (the term component is used also in cases where the component carries phonetic information but the student decodes it as semantic, and when one component is overanalyzed into more components), and {imaginative names} of components are marked with curly brackets. All examples are quoted from students’ notes and translated from Czech language.

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4.1 Basic strategies

1. Story refers to integrating the meaning of the character into a story or short description which helps the student remember the meaning, or connect two or more relatively unrelated meanings together. Story is always related to the meaning of the character. This strategy mostly occurs together with other strategies to attach meaning to semantic components or visual associations. Independent usage is rare; for example: “重: there are so many /layers/ that make the object very /heavy/”; “厂: there are so many /factories/ in China that the word needs a character which is easy and quick to write.” 2. Radical or Component refers to remembering the character by its semantic radicals or components. This strategy occurs both independently and in combinations. It decomposes characters into graphical components and uses generally acknowledged terminology to name them. For easier orientation, this strategy is named Radical in the text. Depending on the number of described components, several variations of independent usage of this strategy have been identified: 2.1 Single component — only one component is determined as key to the retention and retrieval of the character, for example: “练 has 纟 <silk> on the left”; “趟 has 走 <walk> on the left”; “诉 includes the radical 讠 <speech>.” 2.2 Partial component analysis — two or more components are named by their radical names or the meanings they carry if used as independent characters, and part of the character is left undescribed; for example: “夜: <roof> and <person>.” 2.3 Full component analysis — the compound character is decomposed into parts and all of them are described by their radical names or meanings they carry as independent characters; for example: “相: <tree> <eye>”; “答: <bamboo>, <a person>, <one>, and <mouth>”; “怕: <white> <heart>.” 3. Imagination refers to the description of the visual resemblance of part of the character, or the whole character, to an object, symbol, number, letter of the alphabet, or to a simple description of the shape of the lines. When looking at the characters, beginning students form all kinds of images which help them attach some meaning to an otherwise seemingly meaningless mishmash of strokes. Imagination always creates a visual association between the graphic structure of a character or character component and a real-world object, which provides the character or character part with a name. This strategy frequently uses an “A looks like B” structure. Imagination is often applied to a part of the character only or is combined with other strategies. Several subtypes have been observed:

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3.1 Association to objects — examples: 兴: “looks like {a star},” “{a smiley with a pipe},” or “{a bench in the rain}”; “哭 looks like {a face with moustache}”; 夏: “looks like {a grill},” or “{a person under a parasol}”; 非: “looks like {a broken ladder},” “{a double sided hair comb},” or “{a guide post}.” 3.2 Association to symbols — examples: “费 looks like $”; “元 looks like the Greek letter pi π.” 3.3 Association to letters of the alphabet — examples: “啊 looks like the strangely written word OBOJ”; “尺 looks like the letter R”; “the right-hand component in 极 looks like the capital letter B”; “怎 looks like the combination of letters Z E N.” 3.4 Association to numbers — examples: “the left-hand component in 收 looks like the number 4”; “the left-hand component in 观 looks like the number 7.” 3.5 Description of lines — examples: “救 has a lot of dots,” “正 has only straight strokes”; “I remember 参 thanks to the last three strokes.” 4. Component Comparison refers to integrating new characters into the system of already-learned characters by searching for common parts or components. Having seen or learned part of a character before substantially accelerates the learning process. Based on similarities between characters, an inner conceptual system is built and expanded. The Component Comparison strategy is based on the analysis of the graphic structure of one character in comparison to another, referring to identical components shared by both characters. This strategy, however, requires the knowledge of a certain number of characters, and is used both independently and in combination with others. Examples: “母 has the same component as 海”; “the left-hand component in 刚 is identical with the right-hand component in 钢”; “I remember 包 from 泡 and 饱”; “I remember 尺 from 迟”; “I remember 重 from 懂.” 5. Word is a strategy of learning characters as parts of polysyllabic words. This strategy is mostly used independently. Examples: “车 is in 火车”; “除 appears in the word 除非”; “险 appears in 危险.” 6. Similarity is a strategy closely related to Component Comparison — both strategies are based on the analysis of graphic structure, and both create an interaction between old and new knowledge. The difference is that this strategy is not based on the explicit identification of common components across characters, but rather on the pure graphical resemblance between two characters. These similarities might not be apparent to advanced learners or native speakers who are inclined to use component analysis rather than graphical resemblance. Examples: “the left-hand part of 都 is similar to 老”; “找 looks like 钱”; “I often mistake 病 for 西”; “the bottom part of 象 is similar to 家”; “ 许 is similar to 年”; “公 looks like 么 with an extra stroke.”

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7. Drawing — some students use drawings to create associative connections between a character and its meaning, or visual resemblance to something else. Drawings can be related to the whole character or a component, and are often accompanied by explanations. Examples:

8. Emotion — some students relate certain characters to emotions, describing how they feel about the character, or about the difficulty or complexity of remembering or writing the character. This strategy is mostly used independently. Examples: “厂 is a very impoverished character”; “李 is my favorite fruit”; “极 has a new and interesting component 及”; “确 looks weird”; “I remember 年 thanks to the tiny dot which is so uncomfortable to write.” 9. Etymology — this strategy uses the knowledge of the etymology provided in the textbook or other teaching materials, and is used both independently and with others. Examples: “集 is birds gathering on a tree”; “高 is a picture of a tower”; “算 is two hands working with bamboo counting sticks or an abacus”; “I remember 隹 as a pictogram.” 10. Pronunciation includes strategies related to the sound of a character, or to the pronunciation of its translation in Czech or English. This strategy is mostly used together with Story or other strategies. Examples: “the pronunciation of 已 yǐ sounds like the Czech již ‘already’”; “怕 pà sounds like the Czech word bát ‘to be afraid of’”; “板 bǎn sounds like the Czech pán ‘Sir’.” Interesting combinations occur together with the Imagination strategy based on letters of the alphabet, when students search for shapes reminding them of the meaning or pronunciation; for example: “the bottom part of 茶 looks like a T as in the English word ‘tea’”; “the right-hand component in 时 looks like a T as in its English meaning ‘time’”; “<bamboo> in 筷 looks like a K, which stands for kuài”; “the upper component in 希 looks like an X, which stands for xī.” Less frequently-used strategies include those based on (1) information from other courses or contexts (Chinese conversation class, Japanese class, the name of a restaurant, a friend’s name, etc.) — e.g. “I remember 海 thanks to Restaurant Shanghai”; “I remember 年 from my friend’s name 骏年”; “茶 is a familiar character”; (2) a character of the opposite meaning — e.g. “近 is opposite to 远”; or (3) traditional characters — e.g. “言 is a traditional version of the simplified radical 讠”; “I remember 厂 thanks to 廠 — there is nothing left under the {roof} now.”

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The statistical analysis of basic strategies used both independently and in combination shows a significant tendency to elaborate semantic information in mnemonics — 28% of all strategies used Story to encode information about the meaning or structure of a character. The naming of Radicals or Components appeared in 20% of strategies, which was same as the number of strategies using Imagination, to create an association with what the component or character looks like (see Table 3).

Table 3. Strategies used both independently and in combinations by percentage Story 28.2% Drawing 2.4% Radical 19.9% Emotions 2.3% Imagination 19.9% Etymology 2.3% Component Comparison 8.3% Japanese1 2.3% Word 7.2% Pronunciation 1.7% Similarity 4.0% Other strategies 1.5% TOTAL 100%

4.2 Combinations of strategies Since the learning of characters consists of learning their graphical structure, meaning, and pronunciation, a large number of strategies combined two to four basic strategies to include as much information as possible into one mnemonic. Logically, by far the most frequent combination strategy includes the information on a character’s graphic structure and meaning. Following is a list of the most frequent combinations with examples: 1. Radical + Story (1) 语: “I speak <five> 五 /languages/ and I speak with my <mouth> 口.” (2) 若: “/If/ you take <grass> 艹 with your <right> 右 hand and eat it, you will get sick.” (3) 累: “being /tired/ = lying like <silk> 糸 in the <fields> 田.” (4) 米: “/rice/ is a <tree> 木 with two dots.” (5) 忘: “it is difficult for a <heart> 心 to /forget/.”

1. Japanese, as a type of context strategy, appeared with students who took parallel classes of the Japanese language. Knowledge transfer is applicable only for students with a knowledge of the Japanese language; therefore, it was excluded from the overall statistics and subsumed within the Context strategy.

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2. Story + Imagination (1) 卖: “the {cross} 十 on the top indicated that I am not buying, I am /selling/.” (2) 参: “looks like a {lady in an evening outfit} that is dressed up to /participate/ in a ball or /visit/ somebody.” (3) 哭: “looks like {two eyes} 吅 and they are /crying/.” (4) 救: “the left-hand part looks like it is {flashing light} — an ambulance is flashing on the way to /save/ somebody.” (5) 楚: “the top part 林 looks like {stars} which are /clear/.” (6) 车: “includes the number 4 — a /car/ has 4 wheels.” 3. Radical + Component Comparison (1) 注: “<water> 氵 and the right-hand component from 住.” (2) 板: “<wood> 木 plus component from 饭.” (3) 房: “<door> 户 plus the character for “method.” 方.” (4) 忘: “I remember the top part from 忙 plus there is a <heart> 心 below.” (5) 记: “<word> 讠 plus the right-hand part of 起.” 4. Radical + Story + Imagination (1) 惜: “<heart> 忄 indicates some feeling, and the component on the right 昔 looks like {a troubled face} = /to regret/.” (2) 害: “he fell down the {ladder} 丰 and /harmed/ his <mouth> 口.” (3) 忘: “ {a table} 亡 and a <heart> 心 — there is a heart /forgotten/ under the table.” (4) 量: “ {a person} 里 is /measuring/ how big the <sun> 日 is.” (5) 室: “looks like {a lamp} 至 under the <roof> 宀 in a /room/.” (6) 时: “<sun> 日 and an <inch> 寸 which looks like the letter t, t stands for / time/.” 5. Radical + Imagination (1) 价: “<a person> 亻 and a {house} 介.” (2) 忽: “ {hair comb} 勿 and a <heart> 心.” (3) 棵: “<wood> 木 and {wood with a head} 果.”

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(4) 睡: “<eye> 目 and something that looks like a bed frame 垂.” (5) 答: “ {house} 合 with <bamboo> 竹 on the roof.” (6) 管: “<bamboo> 竹, <roof> 宀, and the letter B.” (7) 雪: “<rain> 雨 falling on a reversed letter E.” 6. Radical + Component Comparison + Story (1) 意: “sound 音 pondering through the <heart> 心 is an /idea/.” (2) 惊: “Beijing 京 is close to my <heart> 忄 which /startles/ me and /surprises/ me.” (3) 筷: “/chopsticks/ are made of <bamboo> 竹; one can eat quickly 快 with chopsticks.” (4) 让: “I /allow/ him with <words> 讠 to climb up 上.” (5) 选: “gentleman 先生 <walks> 辶 down the road and /chooses/ something in the shopping windows.” 7. Similarity + Story (1) 久: “a man 人 which is slightly longer — means /long/.” (2) 晨: “the bottom part looks like 农 (peasant) — peasants get up early in the / morning/.” (3) 找: “looks like 钱 (money) — to give money back, /to give change/.” (4) 总: “looks like a reversed 只 (only) — the opposite of ‘only’ is /always, together/.” (5) 年: “looks like 书 (book) — books are many /years/ old.” 8. Emotions + Story (1) 表: “for some reason, I hate this character as much as I hate creating /tables/ in MS Word.” (2) 久: “the character writes quickly, it does not /take long/ to write it.” (3) 懂: “I really do not understand how such a difficult character can carry the meaning /to understand/.” (4) 藏: “I do not want to travel to /Tibet/ because it is the character with the highest number of strokes in the textbook.”

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(5) 等: “one needs to /wait/ for a while to remember all the strokes of this character.” (6) 路: “I do not like writing this character as much as I do not like the /road/ to school.” All of the combination strategies listed above have a usage frequency higher than 1% of the total number of strategies. The research, however, identified another 86 strategy combinations, showing that students use a great variety of approaches to memorize characters. A statistical comparison of combinations shows that by far the most popular combination is Radical & Story which comprised over 36% of all combinations. The second most frequently used combination was Story & Imagination with 16%. Again, the numbers speak in favor of semantic and orthographic elaboration (see Table 4).

Table 4. Usage frequency of combinations of strategies Radical + Story 36.6% Radical + Component Comparison + Story 2.6% Story + Imagination 16.0% Similarity + Story 2.4% Radical + Component Comparison 8.1% Emotions + Story 2.2% Radical + Story + Imagination 6.5% Other 19.2% Radical + Imagination 6.4% TOTAL 100%

When usage totals of combination strategies are compared with individual basic strategies, the most frequently-used strategy is the combination of Radical + Story with 19%. The second most frequent strategy is the analysis of Radicals with 12.8%, followed by memorizing the character in a Word with 9.1% (see Table 5).

Table 5. Usage frequency of both individual and combined strategies Radical & Story 19.0% Radical & Component Comparison 3.5% Radical 12.8% Radical & Story & Imagination 3.3% Word 9.1% Radical & Imagination 3.2% Story + Imagination 8.8% Similarity 2.9% Imagination 6.2% Other (103 individual and combined st.) 27.2% Component Comparison 4.1% TOTAL 100%

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5. Discussion and conclusion

Second-language teachers often focus on the teaching process without understanding what is happening behind the stage; that is, how students further manipulate the learning material and what strategies they use to memorize new information. Without understanding the actual procedures related to retention, recognition, and production, teachers’ knowledge of the whole learning process is very limited. The aim of this research was to explore the learning process from the learner’s perspective. In class, the learner is given complex information on each Chinese character, but which pieces of information he or she will use to memorize the character and how the information will be processed might differ significantly from the teacher’s presuppositions. The above description of strategies identifies a few interesting factors in the learning process for Chinese characters. Learning strategies are based on chunking, naming, and information linking, but tend to overlook the phonological aspects of characters. First, the strategies examined demonstrate a natural inclination toward chunking. Chunking is a process of clustering information during a memory task, in which pieces of information are grouped into higher units which are smaller in number than the individual units, in order to reduce demands on the limited capacity of the working memory. In the case of Chinese characters, instead of memorizing ten or twenty individual strokes, there is an option for memorizing a significantly smaller number of components. The decomposition of some compound characters is relatively clear since the components are separated by space (for example left-right structures: 相, 和; top-bottom structures: 点, 雪; and outerinner structures: 国, 图). Students show a strong tendency to analyze characters into parts, though sometimes the result of their analysis is not conventional: 意 is either correctly analyzed as 音 and 心, or overanalyzed as a composition of three components: 立, 曰, and 心; 答 is either analyzed as 竹 and 合, or overanalyzed into four smaller components: 竹, 人, 一, and 口. In some cases, wrong chunking methods may even lead to an incorrect stroke order; see the following examples: (1) 乘: “north 北 on the <grain> 禾 artificial decomposition.” (2) 镜: “/mirror/ is a piece of polished <metal> 钅, which we set up somewhere 立(stand, erect) and look into it 見 incorrect identification of the lower right-hand component.” Applying character decomposition and component analysis in character learning appears to be a frequently-used strategy, which is in concordance with Ke’s (1998) findings of students’ preference for learning components, as well as Shen’s

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(2005) finding of students’ need for orthographic knowledge as cues in memorizing new characters. Second, strategies demonstrate a strong tendency towards semanticization — naming individual components to memorize them more easily. In the case of semantic radicals, students can use the canonical terms (wood 木, woman 女, person 亻, water 氵, etc.). To accommodate the need to name other components, students apply numerous strategies: Imagination, to associate components with pictures, objects, symbols, numbers, or letters of the alphabet; Drawing, to picture the meaning without words; Component Comparison, which uses another character as a reminder; or a pure description of the strokes. Students establish their own individual lists of imaginative names for components or strokes. Sometimes, a student uses one name to refer to various structures, a strategy which might lead to confusion in retrieval and production, as in the following examples: (1) {lightning conductor} association used for different structures: “准: <ice> 冫, <person> 亻 and {a lightning conductor}”; “理: another type of {lightning conductor} and 里”; “声: {a lightning conductor} 士 and {a mask on stick}.” (2) {flag} used for different structures: “永: <water> 水 with a {flag}”; “久: a person 人 with a {flag}”; “息: <an eye> 目 with {a flag} and a <heart> 心 below” These two findings support the need to include component analysis and semantic radical instruction in the process of teaching beginning learners. It is important to remember that for a beginning learner of non-character background, Chinese characters are merely tangles of strokes. Naming components helps students create meaningful contents out of seemingly disconnected units of information: it is easier to remember that “声 is {a lightning conductor} 士 and {a mask on stick}” than a sequence of seven strokes without any hint. However, even though imaginative techniques can be useful in memorizing individual characters, systematic categorization is more effective from a long term perspective. Therefore, development of adequate and accurate knowledge of frequently used radicals can help students build up a solid foundation for further studies. The semanticization phenomenon does not seem to be a frequently debated issue in the previous research. Third, links between the graphic and semantic information are created via fabricated stories based on radical names or imaginative labels. This seems to be a powerful strategy; therefore teachers should work to enhance the students’ elaborative skills. For example, one possibility would be to provide students with sufficient cultural and etymological information, where the data can be relevant to the meaning of a character in modern Chinese. Using this information, students can

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then employ their associative skills to create stories that connect the form of the character with its meaning and pronunciation. Last but not least, students use phonetic radicals only to a very limited extent. This finding is in accordance with previous studies (Ke 1998). Students seem to be building a database of semantic radicals, yet they ignore phonetic radicals. Instead, phonetic radicals are endowed with semantic information and treated as semantic components, interpreted as a part of a similar character, or endowed with imaginative meaning. This tendency is typical both for phonetics that do not reflect modern pronunciation and for those that do, for example: “院: 元 occurs in garden 园, a garden under the <roof> 宀 with a <hill> 阝 beside it is a /yard/” — 完 wán is a phonetic radical that does not reflect the modern pronunciation of the character yuàn —; “骂: two <mouths> 口 above a <horse> 马” — 马 mǎ is a phonetic radical that closely reflects the modern pronunciation mà, differing only in tone —. The limited use of phonological information can either be explained by the already mentioned limited accuracy of phonetics in general, or by the fact that beginning students have not learned enough characters yet to make knowledge of phonetics useful. Phonological information does appear in comparisons of two or more characters that have a similar pronunciation; for example: “包 has the same pronunciation as 饱”; “华 is similar to 花 in both shape and pronunciation”; and “清 has the same pronunciation as 请, and the same right side.” Rather than making associations with phonetic radicals, some students apply phonetic clues linked to the Czech or English words representing the meaning of the character. The small percentage of phonological information used in character learning strategies also demonstrates the students’ preference for creating a closer connection between graphic and semantic information while memorizing phonological aspects separately. Even though the accuracy of phonological information encoded in phonograms is not very high, the ability to process phonetic components is an important skill from a long-term perspective. Yet this finding questions the effectiveness of requiring students to apply phonetic radical knowledge in the early learning period. In general, the described learning strategies help students incorporate various amounts of information about the graphical structure (of single components or entire characters), semantic information (referring to one or more meanings), pronunciation, and usage in context of a word or phrase, into one information unit. The degree of cognitive analysis incorporated in strategies varies from single pieces of information elaborated by basic strategies to complex information elaborated by combined strategies, where the Story strategy works as an information connector. The amount of information that is further elaborated varies, yet any type of elaboration is proof of a conscious approach to the learning task.

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6. Pedagogical implications

Based on the results of the research, several suggestions for teaching Chinese characters can be derived. First, a high percentage of students either do not use learning strategies at all or did not feel a need to describe them in the study. There is also a certain probability that many strategies were unknown to students as there is not enough emphasis put on strategy instruction. Yet there seems to be much space for improvement: teachers may develop students’ strategy skills through group discussions, sharing experience, and explaining the potential effects of learning strategies on learning outcomes. Teachers should be aware that most beginners have no experience learning logographic script and do not know how to approach the learning task. Strategy instruction should therefore be included in character instruction and students should be encouraged to explore different strategies. Those listed above can serve as illustrative examples. Second, the Chinese character instruction given to the research group put a relatively high emphasis on explanation of the etymology of each character — the original meaning of the character, and its components and categorization within the six types (liushu). This study shows that the number of strategies using etymological clues is rather low and that students prefer to create their own stories. The time spent in class on detailed explanations of etymology therefore does not seem to be time well invested. The only frequently used etymological information concerns character radicals, and students seem to prefer using radicals in combination with the Story strategy as a substitute for etymology. Third, radical instruction is generally acknowledged as an important and necessary step in learning characters. This study also fully supports the need for radical instruction, emphasizing the importance of the ability to name character components. Students show a tendency to decompose characters first, attach names to individual components, and then further process them as verbal units. To help them process the radicals systematically, teachers can consider systematically using a fixed set of names, including radical names, in teaching materials and exercises, providing students with a full list of radical names, and practicing radical names to build a solid knowledge of radicals. In summary, having adequate insight into the learning strategies used by students can help language teachers design strategy training that would help students develop analytical thinking and offer learners a variety of strategy choices. In order to accommodate the needs of all types of learners, further research is necessary to analyze the relationship between learning styles and strategy selection.

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提要

自80年代来，中外学者们对于汉字学习策略的研究共同显示，学习者倾向依赖机械性 重复抄写与背诵，而此倾向在尚未习得一定数量汉字的学习者中尤其明显，其主要原 因是他们无法利用部首知识记忆汉字。本研究之目的为描述初级汉语学习者的汉字学 习策略与实际使用的方法。研究时间为期一学期，对象为50位捷克大学生，要求他们 记录为了熟记汉字而使用的各种方法。经由归类分析与频率统计将研究资料分为十种 基本学习策略：编造故事、部首、想像、部件比较、造词、找出相似性、画图、情感 策略、字源与发音。这些策略或独立使用，或综合使用，显示初学者倾向以部件解析 汉字，着重利用汉字的图象与意义联想熟记汉字，少用声符类比策略来熟记汉字。

关键词：汉字，学习策略，部首，初级华语学习者

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