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Graphemic Awareness Development of Polish Learners of Chinese as a Foreign Language

A b s t r a c t

Metalinguistic orthographic awareness plays a crucial role in the development of Chinese language proficiency: writing, reading, and learning new words. However, few studies have explored the topic using qualitative methods. The aim of this work is to explore how the perception of Chinese characters of Chinese foreign language learners changes along with their proficiency. The responses were collected from 43 Polish university students of Chinese with the use of a graphemic awareness test during which participants were to decide on correctness of presented pseudo-characters. The results of this study show that beginners focus first and foremost on correctness of the strokes, the intermediate learners' attention shifts to character elements and their correct position, and the advanced learners analyze the characters taking into consideration both character elements and structure of characters. It is suggested that the overall rapid development of graphemic awareness in the study group might be due to the explicit instruction. The conclusion can be drawn that the described shift in learners' perception is a result of them learning to direct their attention towards the critical orthographic aspects of the characters.

Keywords: characters, Chinese as foreign language, Chinese characters learning, metalinguistic awareness, graphemic awareness

Introduction: Learning the Chinese Writing System as a Second Writing System

The writing system is considered to be the most difficult aspect of learning Chinese as a foreign language (Chuang & Ku, 2011; Everson, 1998; Shen, 2004; Xu 2013). Multiple reasons for the difficulties have been indicated: the fundamental difference in the way Chinese and alphabetic writing systems encode linguistic information is one of them. The Chinese writing system is logographic, or more specifically, morphosyllabic—generally one grapheme encodes one syllable and one morpheme, while in alphabetic writing systems generally one grapheme encodes one phoneme. The Chinese writing system orthography is also different from the alphabetic one, with a large number of graphical units and complex ways according to which they are combined to compose a single grapheme.[1] The manner in which graphic components combine to form Chinese characters and in which characters construct words differ from the way letters construct words in alphabetic writing systems. Therefore, more morphological awareness is necessary when reading a text in Chinese (McBride, 2016; Wang et al., 2004). Other difficulties posed by the Chinese writing system noted by previous research are: the number of characters that needs to be learned, and lack of obvious correspondence between sound and script (Shen, 2005; Shen & Ke, 2007).

The process of learning a foreign language writing system is not the same as learning the rules of the one's first writing system. While the learner of a foreign language already knows how writing systems work in general, they may have to understand and internalize the different ways the foreign language writing system encodes linguistic information. To shift between a phonological writing system, as in the case of the Polish alphabet, and a morphosyllabic Chinese writing system, it is necessary for the learner to understand the different fundamental rules of the new writing system and develop the different aspects of metalinguistic orthographic awareness.

Currently, seven Polish universities offer Chinese Studies as a major, with six universities providing dedicated Chinese writing system classes. The duration of instruction hours during the first year of study varies between programs, ranging from 30 to 120 hours. A typical curriculum[2] includes

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[1] More details on Chinese writing system orthography (structure and elements of characters) can be found in articles written by Wang et. al. (2004), Shen & Ke (2007).

[2] Data based on study programs as well as syllabi published by universities (in alphabetical order): Adam Mickiewicz University in Poznań, College of Modern Languages in Poznań (private university), Jagiellonian University in Kraków, John Paul II Catholic University of Lublin, University of Gdańsk, University of Warsaw, University of Wrocław. Only programs called "Chinese studies" or "sinology" were taken into consideration.

instruction on the structure of characters, including strokes, radicals, and other elements of characters, stroke order, basic information concerning the history of the Chinese writing system, and the ability to use dictionaries. The number of characters taught and the choice between simplified or traditional characters are dependent on the teaching program and didactic materials used by each university. Additionally, some programs may also include the basic principles of calligraphy and the role of characters in word formation. In case when dedicated Chinese writing system classes are not offered, the basic language competences needed to use Chinese characters are included in general Chinese language classes.

Study Aim

There is significant interest in the metalinguistic orthographic knowledge of the Chinese writing system in the context of Chinese as a foreign language. However, research on this topic has predominantly been conducted using quantitative methods. Some researchers have addressed that problem; for example, Wang et al. (2004) had pointed out that the addition of post-experimental qualitative questions would lead to a better understanding of the orthographic awareness development process. This study was carried out to provide new insights into this topic using a qualitative method based on the phenomenographic approach to answer the questions:
- How graphemic awareness of Chinese writing system develops in Chinese as a foreign language learners coming from alphabetic background?
- How learners' perception of Chinese characters changes along with language proficiency?

Phenomenography approach is fitting to answer the abovementioned research questions, as its aim is to explore the qualitatively different ways in which people experience, conceptualize and understand various aspects of phenomena.[3] By employing the think-aloud protocol alongside a designed metalinguistic orthographic awareness assessment test, it was possible to explore the answers for the provided task and the reasoning behind the learners' choices. The aim of this paper is to report on the findings of the study investigating the development of graphemic awareness of the Chinese writing system of learners of Chinese as a foreign language coming from an alphabetic language background—adult Polish native speakers.

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[3] More on phenomenography and its uses can be found in Orgill (2012) and Ornek (2008).

Literature Review

Phenomenography

The phenomenography approach emerged in the early 1970s with the publications of Marton, who was searching for new ways to conduct research in education and pedagogy. The main objective was to determine why some learners performed better than others, and to improve the teaching process (Jurgiel-Aleksander, 2016, p. 269). The aim of phenomenography was not examining a particular phenomenon, but rather exploring how it is experienced by people and how these experiences differ from each other (Moroz, 2013, p. 33; Orgill, 2012; Ornek, 2008; Tse et al., 2010, p. 81).

In the 1990s, the "new phenomenography," also known as variation theory, emerged. According to this theory, each phenomenon is associated with a large amount of information, and due to the limitations of human cognition, it is impossible to perceive every aspect of a phenomenon at the same time. Learning involves changing mental representations of phenomena to qualitatively better ones (cf. Orgill, 2012). The main interest of the new phenomenography therefore shifted from describing different ways of experiencing a particular phenomenon to explaining the causes of different ways of experiencing it and utilizing this knowledge during teaching (Orgill, 2012).

The perspective of phenomenography research is referred to as a second-order perspective. The aim of phenomenography research is not to answer the question "what the phenomenon is" but rather "how the phenomenon is perceived" (Jurgiel-Aleksander, 2016, p. 270; Moroz, 2013, pp. 34–35). As such, phenomenography makes it possible to probe into mental representations of phenomena. The result of phenomenography research is the creation of a "map" showing a limited number of ways in which the particular phenomenon is perceived (Jurgiel-Aleksander, 2016, p. 270; Lam, 2010, p. 53; Moroz, 2013, p. 33; Ornek, 2008).

A semi-structured individual interview is the preferred method of data collection in phenomenography research. Its aim is to encourage the participants to reflect on their experiences related to the particular phenomenon. In educational research, participants are often asked to solve tasks using the "think-aloud protocol," which allows researchers to gain insight into the participants' thought process. This allows researchers to gather data that is essential for phenomenography, and often inaccessible with the use of other methods (Jurgiel-Aleksander, 2016; Moroz, 2013; Orgill, 2012; Ornek, 2008). Standard procedure for data analysis and interpretation, which aims to determine the various ways of experiencing the researched phenomenon, is described by Jurgiel-Aleksander (2016) and Ornek (2008).

The phenomenography approach was employed in previous research on learning the Chinese writing system to investigate the development of orthographic

awareness in Chinese children (Lam, 2006, 2010). According to Lam (2010, p. 53), "[according to variation theory], in order to experience the characters in a powerful way, children need to develop a structure of awareness, that is, to direct their focal attention to certain critical aspects of the characters and to be simultaneously aware of them." Lam's research specifically focused on exploring children's knowledge of part-whole relations (relations between the character's elements and the character) and part-part relations (internal relations between character elements), as well as its didactic implications (Lam, 2006, 2010).

In addition, the phenomenographic approach to teaching and learning—bringing learners' attention to key aspects—has been tested in the context of Chinese writing system acquisition by Chinese children (Tse et al., 2010). The study introduced an integrated approach to teaching Chinese characters, which involved directing learners' attention to key aspects of Chinese characters. The effectiveness of this new approach was compared to that of traditional teaching methods over the course of one academic year, in three primary schools in Hong Kong. The reported findings indicated that the proposed integrated approach was more effective in teaching the Chinese writing system to native learners (Tse et al., 2010).

Metalinguistic Orthographic Knowledge

Metalinguistic awareness is generally understood as the ability to identify, analyze, and manipulate language units. Although researchers generally agree that it plays a crucial role in the process of learning to read and write, the conceptualization and exact definitions differ between studies. It can be understood as the ability to reflect on and manipulate the structure of the language; the ability to analyze the language and exhibit conscious control of it; perceiving the language as an object of potential analysis; a way to treat language during the process of production or comprehension (Kuo & Anderson, 2008, pp. 39–41).

In this article, the term metalinguistic awareness will be used to refer to the set of interconnected abilities that concern different structural aspects of the language, and the relations between the language and the writing system. Metalinguistic awareness can be therefore split into the following aspects: phonological, semantic, morphological, graphemic, graphophonological, and graphomorphological awareness. Throughout this paper, the term metalinguistic orthographic awareness will represent three aspects of metalinguistic awareness that refer to the writing system, that is, graphemic, graphophonological, and graphomorphological awareness.

Due to the different ways in which language units are encoded, different aspects of metalinguistic awareness develop in learners of different languages and writing systems. For example, in the case of alphabetic writing systems, such

as the Polish alphabet, the graphophonological awareness will be strongly developed. In the case of logographic writing systems, like Chinese characters, the graphomorphological awareness will be strongly developed. Previous research confirms that the phonological awareness is more important in the case of learning the English than the Chinese writing system, while in the case of the Japanese and Chinese writing systems, the morphological awareness plays a crucial role in reading development (Cook & Bassetti, 2005, p. 18; McBride, 2018, p. xi).

The graphemic awareness is an aspect of metalinguistic awareness that develops during the process of learning the logographic writing systems. It was first defined in the context of research on learning and teaching Japanese *kanji* as the "awareness that *kanji* can be segmented into graphemes and that graphemes can be the subject of analysis" (Toyoda, 1998, p. 156). For the purpose of this study, the graphemic awareness of the Chinese writing system is understood as the awareness of the characters structure as well as the position and function of characters' elements. As only some of the character elements can function independently, they are not all considered graphemes but repeatable stroke clusters that characters are composed of instead.

Most research on metalinguistic orthographic knowledge of the Chinese writing system has focused on its connection to literacy, reading, writing, and learning new words. It has been shown that both learners of Chinese as a foreign language and native speakers made use of morphological, semantic, and phonological information provided by elements of characters (Tong & Yip, 2015). Studies on both groups have also indicated that the graphemic awareness is related to the ability to read characters and learning new ones (Anderson et al., 2013; Shen & Ke, 2007; Tong & Yip, 2015; Williams, 2013). The development of metalinguistic orthographic awareness has also been a topic of research. It has been established that it can develop without explicit instruction after repeated exposure to characters; however, the graphomorphological awareness of Chinese as a foreign language learners developed better after explicit instruction (Wang et al., 2004). In the same vein, Loh et al. (2018) state that knowledge concerning the position of character elements and the legitimacy of characters is implicit and, therefore, difficult to acquire. It has been also determined that encouragement to perceive characters as sets of meaningful parts, that is, using "Meaningful Interpretation and Chunking," enhances students' retention and memorization of Chinese characters (Xu 2013). Shen and Ke (2007) draw the conclusion that three different skills—knowledge of a character's elements, perception of these elements, and their application—do not develop simultaneously, and each of them shows a unique developing trend. Loh et al. (2018) findings are also consistent with those results, as they confirmed that the three types of orthographic awareness develop in an asynchronous manner.

Methodology

Main Study Design

The data analyzed was collected during a larger study on the development of metalinguistic orthographic awareness of the Chinese writing system in Polish learners of Chinese as a foreign language. The approach is mainly based on the new phenomenography (variation theory) approach as it is suitable for addressing the research questions:

- How graphemic awareness of Chinese writing system develops in Chinese as a foreign language learners coming from alphabetic background?
- How learners perception of Chinese characters changes along with language proficiency?

To collect data on the perspectives of learners on characters, their knowledge, and skills in regarding characters, the think-aloud protocol was used during the test. The investigator did not use any terminology that had not been previously used by the study participants: the only term used was Chinese characters (Polish: chińskie znaki).

Graphemic Awareness Assessment Test

The designed test concerned primarily the graphemic awareness of the Chinese writing system. The participants' task was to decide whether or not the presented characters were correct and provide the reasoning for their answers. The stimuli for this task were the following ten characters:

Figure 1

Graphemic Awareness Task—Stimuli

Because the aim of the study was to collect data on learners' orthographic awareness and not their vocabulary knowledge, nine out of ten Chinese characters presented are pseudo-characters that do not exist in the context of the Chinese writing system. Some of the pseudo-characters followed the structural rules of the Chinese writing system—the elements of the pseudo-characters were in their correct place, that is, pseudo-character 2, 3, 8, and 10. The rest of the pseudo-characters had specific elements in incorrect positions: pseudo-characters 1, 4, 5, 7, 9. The stimuli were designed with the use of common character elements and structures. The character number 6 was an existing character and was used as a control item to check whether participants answers would be different in case of real and pseudo-characters.

Participants

A total of 43 Chinese foreign language learners from three course groups participated in this study. Criteria for selecting participants were as follows:
- participants had to be adult learners of Chinese as a foreign language;
- participants had to be Chinese language majors at university with 10 to 14 hours of Chinese language instruction per week with designated Chinese writing system classes;
- participants had to be learners who had started learning Chinese at university and had not previously learned other languages that use Chinese characters.

All of the criteria had to be fulfilled in order for learners to be eligible for participation in the current study. All participants were native Polish speakers learning Chinese at university as their major with little to no previous experience with learning the Chinese. The first-year curriculum of all of the participants included 60 to 70 hours of classes on the Chinese writing system. One participant was excluded from the current study on the basis of previous experience in learning Japanese. The participants were divided into three groups according to the number of hours of Chinese language learning, while the precise moment of data collection varied:

Table 1

Participant Groups

Year of studies	First			Second		Third
Hours of instruction	100+	200+	400+	500+	600+	800+
Number of participants	7	9	6	5	5	10

Informed consent was obtained from all participants.

Data Collection And Analysis

The responses of the participants were recorded and then transcribed. The notes of the participants on the task sheet were also collected as additional data. Data collection was carried out in Polish; examples from the collected data for this article were translated into English. During the data collection process, member checking was employed: restating the participants' responses and requesting confirmation or clarification of specific statements to verify the accuracy of the data. The transcripts were analyzed using the phenomenographic method in the following steps:

- Data familiarization (reading through the collected data);
- Data compilation (sorting the data thematically);
- Data condensation (finding the most significant elements in participants' answers);
- Preliminary grouping (grouping the determined elements together);
- Comparison (comparing and naming the determined categories);
- Creating outcome space (contrastive comparison of determined categories).

The data, including transcripts and notes of the participants, were analyzed using the MAXQDA Analytics Pro (ver. 2022) software. Themes were derived from the data in an inductive manner. The raw data, in Polish, is available at request from the corresponding author.

Results

Beginner

Table 2

Beginner Learners' Answers on Pseudo-Character Correctness[4]

Stimuli	PC1	PC2	PC3	PC4	PC5	PC6	PC7	PC8	PC9	PC10
Correct	17	13	14	1	2	17	0	16	0	15
Incorrect	0	4	3	16	15	0	17	1	17	2
Strokes	1	6	5	3	2	2	1	3	3	6

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[4] Key: PC: pseudo-character, C: character, number refers to Figure 1.

Table 3

Detailed Responses with Learners' Comments on Strokes Marked in Grey[5]

Participant	PC1	PC2	PC3	PC4	PC5	PC6	PC7	PC8	PC9	PC10
F 11	I	C	C	I	I	C	I	C	I	C
F 12	I	**I**	**I**	**I**	**I**	C	I	C	I	C
F 13	I	**I**	C	C	I	C	I	**I**	**I**	C
F 14	I	C	C	**I**	I	C	I	C	I	C
F 15	I	C	C	I	I	C	I	C	I	C
F 16	I	C	**I**	I	C	C	I	C	I	**I**
F 17	I	I	**C**	I	C	C	I	C	I	C
F 21	I	C	C	I	I	C	I	C	I	C
F 22	I	C	**C**	I	I	C	I	C	I	C
F 23	I	**C**	**C**	**I**	I	**C**	I	**C**	**I**	**C**
F 24	I	C	C	I	I	C	I	C	I	**C**
F 25	I	C	**C**	I	I	C	I	C	I	I
F 26	**I**	C	C	I	I	C	**I**	C	I	C
F 27	I	**I**	**I**	I	**I**	C	I	**C**	**I**	**C**
F 28	I	C	C	I	I	C	I	C	I	**C**
F 29	I	C	C	I	I	C	I	C	I	**C**

There were a total of 16 participants at the beginner level, 12 of whom identified as female and four of whom identified as male. The age range of the participants was 18 to 24 years, with a median age of 20 years and a mean age of 20.31 years. The results of the graphemic awareness test are presented in Table 2 and Table 3. Table 2 provides an overview of the beginner level learners' answers on correctness and incorrectness of presented pseudo-characters with an indication of how many of the participants elaborated on stroke correctness. Table 3 provides detailed answers that contain mentions of the correctness of the strokes indicated with grey color. From Table 3 it can be noted that multiple learners paid attention to strokes and their correctness during this task. All participants decided that C6 is correct. Participants comments did not differ between C6 and pseudo-characters. Through the analysis of the responses of the beginners, three themes were identified: strokes, elements, and uncertainty. These three themes are analyzed in detail in the following sections.

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[5] Key: PC: pseudo-character, C: character number refers to Figure 1; F: first year of study, number refers to particular participant (numbers starting with 1: 100+ hours of instruction, starting with 2: 200+ hours of instruction); I: incorrect, C: correct.

Theme One: Strokes

Beginners during their analysis focused on general orthographic correctness of the presented pseudo-characters, that is, on strokes angles, length, their relation to other strokes. Examples of comments are as follows:
- F12 "This should be more slanting to the left, here to the right."
- F13 "It looks like it was written with one stroke and it should be two."
- F17 "It doesn't stick out here, the horizontal line should stick out a little bit from the left and right sides."

Some learners did not mention the incorrect position of the elements, their only reason for determining that the character is incorrect being the strokes position. In other cases, learners commented on the strokes first and then after some thought added comments concerning elements, for example:
- F12 "This stroke doesn't touch that one, so this is incorrect" [referring to PC4, no mentions of elements].
- F14 "In this first element, this stroke shouldn't touch the bottom one" [referring to PC4, no mentions of elements].
- F27 "I'll start with that what I noticed first—this stroke should connect to this one" [skips the PC1, starts from PC2].

The learners also made comments on the general visual outlook of the characters, for example:
- F16 "I've never seen strokes in such a configuration."
- F17 "The number of dots doesn't fit, if there were two it would be more correct, but maybe three are fine too…"
- F23 "I'm not sure if it's a problem, I'd write them closer, maybe more symmetrical."

Theme Two: Elements

The beginners also noted the errors connected to the elements of the characters. Some of the comments concerning the elements were general remarks about their position, as in the following examples:
- F12 "It seems to me that the last three [dots/strokes], that last element, I, like, don't know these characters, but as a rule, when I was learning, this last element was standing at the beginning of character, I think it opens the character."
- F16 "This character arises my suspicions, the element on the left usually is on the right."
- F17 "It seems to me that this element could also be on this side, but on the right side it would be more correct."

The participants also mentioned the names of the semantic elements that they had recognized: *water* [氵], *person* [亻], *heart* [忄], and *speech* [讠]. Examples

of learners commenting on incorrect positions of elements while referencing their names are:

- Fl1 "It seems natural to me for *standing person* to be on the left side, this version seems unnatural to me."
- Fl2 "I'm not sure with this one, *heart*, this element on the top, shouldn't it be on the bottom?"
- F23 "According to my knowledge at this point it [this character] seems incorrect because I'd put *three drops of water* on this side, as I'm saying I don't remember them to be on the right side."

Beginner-level learners tended to have problems with recognition of the elements: they were not sure of their names, stated they did not know the elements, or they mistook elements for each other. In some instances, only after some time and thought did they point out the incorrect position of element in pseudo-characters:

- Fl1 "There should be one more dot on the right side [referring to the *knife* [刂] element in PC5, probably mistaking it for *heart* [忄] element]."
- Fl7 "*Heart* element was always on the bottom of character, and this element, I've never seen it before, so I don't know if it's correct."
- F27 "I don't have any concerns with this one [after a while], oh wait, that *standing person* should be rather on the left."

Theme Three: Uncertainty

Another theme identified in the beginner-level learners' statements is general uncertainty. The learners often used the phrases "for me," "in my opinion," "it seems to me" in their statements. In some cases, their explanation on their answers consisted only of their general intuition, and they could not elaborate on their reasoning:

- Fl2 "I'd say that this one could function."
- Fl3 "This one seems good to me."
- Fl7 "I think that this one could be seen as correct."

Beginner-level learners also made comments on their limited knowledge of the characters and the Chinese language:

- Fl4 "It might be because of my lack of character knowledge, these three little strokes up and down, they are maybe called *three drops of water*…"
- Fl6 "I'm not a specialist on the Chinese language, but I think this one is incorrect."
- F23 "As far as I know at this point, this character seems incorrect."

Intermediate

Table 4

Intermediate Learners' Responses on Pseudo-character Correctness[6]

Stimuli	PC1	PC2	PC3	PC4	PC5	PC6	PC7	PC8	PC9	PC10
Correct	16	12	14	1	3	15	0	15	2	10
Incorrect	0	4	2	15	13	1	16	1	14	6
Strokes	0	3	2	2	0	0	1	1	2	2

Table 5

Detailed Answers with Learners' Comments on Strokes Marked in Grey[7]

Participant	PC1	PC2	PC3	PC4	PC5	PC6	PC7	PC8	PC9	PC10
S 11	I	I	C	I	I	C	I	C	I	I
S 12	I	C	C	I	I	C	I	C	I	C
S 13	I	C	C	I	C	C	I	C	I	C
S 14	I	C	C	I	I	C	I	C	I	C
S 15	I	C	C	I	I	C	I	C	I	I
S 16	I	I	I	C	I	C	I	C	C	C
S 21	I	I	I	I	I	C	I	I	I	C
S 22	I	C	C	I	I	C	I	C	I	C
S 23	I	C	C	I	I	C	I	C	I	C
S 24	I	C	C	I	I	C	I	C	I	C
S 25	I	C	C	I	I	C	I	C	I	I
S 31	I	C	C	I	I	C	I	C	I	I
S 32	I	C	C	I	I	C	I	C	C	C
S 33	I	C	C	I	C	I	I	C	I	I
S 34	I	C	C	I	I	C	I	C	I	I
S 35	I	I	C	I	C	C	I	C	I	C

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[6] Key: PC: pseudo-character, C: character, number refers to Figure 1.

[7] Key: PC: pseudo-character, C: character number refers to Figure 1; S: second year of study, number refers to particular participant (numbers starting with 1: 400+ hours of instruction, starting with 2: 500+ hours of instruction, starting with 3: 600+ hours of instruction); I: incorrect, C: correct.

There were a total of 16 participants at the intermediate level, 11 of whom identified as female and five of whom identified as male. The age range of the participants was 19 to 28 years, with a median age of 21 years and a mean age of 21.19 years. Tables 4 and 5 provide an overview of the data from the test conducted on intermediate learners. The responses of the learners containing mentions of strokes' correctness are summarized in Table 4, while detailed answers are indicated with grey color in Table 5. What is noticeable here is that more than half of the participants do not mention strokes at all, focusing more on general character structure and position of the elements instead. All but one participant decided that C6 is correct. Participants comments did not differ between C6 and pseudo-characters. Four general themes were identified through the analysis of intermediate learners' answers: elements; structure of characters; uncertainty; stroke correctness. These themes are presented in detail in the following sections.

Theme One: Elements

Intermediate-level learners during their analysis of the pseudo-characters often referred to the elements by their Polish names, but sometimes they would also use their Chinese names. Sometimes only the word 'element' was used—but mostly in the cases of elements that are not radicals and therefore do not have names. Examples of learners mentioning the names of elements are:

- S13 "Again, in this character, this element, it's *speech* I believe, I would put it on the left side of the character, under this, under this lid [referring to *roof* element]."
- S23 "Next character, it's not good, here there is a *speech* character *yan*, on it should be on the left side, beginning the character."
- S25 "The fourth character is probably not correct, because this element on the right side should be on the left side."

The elements that learners recognized and mentioned in name are: *water* [氵], *person* [亻], *heart* [忄], *speech* [讠], *roof* [宀], *knife* [刂]. Interestingly, only a few learners mentioned the *mouth* [口] element, although it is one of the most basic and common ones.

- S12 "And maybe here *heart*, I think heart usually is located on the bottom part of the character rather than top part."
- S15 "The same with this *knife*, it can only be on the right side."
- S24 "The fourth [character] is not [correct], because *person*, I think it should stand on the other side, I can't remember any character in which *standing person* was on the right side."

Intermediate learners used different terms to refer to elements, and some-times the same participant used different terms throughout the task. The terms

used by the participants are "radical," "element," "character." There was no significant pattern in the colocation of terms with particular elements—the same element could be called "element" or "radical":

- S11 "The elem… radical *three water drops* is on the left side, so like, this character is incorrect for sure."
- S21 "It's rather strange that this *three water drops* element, that it is in this position."
- S22 "The first [character] is incorrect, because the *water* character should be on the left side."

In some cases, learners were not sure if they recognized the element correctly, forgot the name of the element in question, or mistook the element for another one. The learners most often had problems with *knife* [刂] element—instead of recognizing it and pointing out the incorrect position, learners would rather mistook it for *heart* [忄] element or *small* [小] element.

- S21 "At the end [pointing to the right side of character] there is something connected to the sea, it's fish maybe… [referring to pseudo-character 10]."
- S22 "It's the same here, because of… this… [pointing at the *speech* element], it should be on the left side if anything."
- S23 "If I see correctly, there is a vertical line with a hook, so it should be *heart* or *xiao* [*small* element], but I've never seen a character with something like that standing in the front."

Theme Two: General Layout and Structure

Intermediate level learners commented on the general layout, structure, and outlook of the characters. In some cases, the comments were connected mostly to how the participant felt about the character and whether or not it looked complete and orderly or chaotic and incorrect:

- S11 "This one looks too chaotic, this left side has this thing…"
- S14 "There are elements, that have their set places, it helps us decide if character is correct or not."
- S16 "It looks full, it looks like a complete character, I like it a lot."

Apart from general comments on character structure, participants often commented on particular elements of the characters—some learners would only express that the element did not feel right in the place it was in, but most of them would refer to their knowledge of correct element positions:

- S14 "I have to say that this character is incorrect, looking at the element that is located on the bottom right, it's also an element that is never on the inside of the character, usually on the outside part, on the left."
- S16 "I think that this heart fits at the top, but it would fit better at the bottom."
- S24 "Something seems off, like this *heart* on the top doesn't speak to me."

What is also noticeable is that some participants not only analyzed positions of single elements in a character, they also took into consideration whether or not particular elements fitted each other:

- Sl4 "The combination of these two elements would be rather strange."
- Sl6 "A lot of things don't fit here, for sure *speech* on the left side, it also doesn't go well with the character with a *roof*."
- S24 "Something in it looks… I know what it is, this part that is under *roof*, it would look better if that *knife* and *mouth* would be put on the other side, and this element [referring to *speech* element], *sound* or something like that put on the other side."

Therefore, it can be presumed that intermediate level learners start to perceive characters as a set of elements that compose a coherent single unit—a character.

Theme Three: Uncertainty

During the task, intermediate learners were sometimes uncertain of their answers, they would hesitate and use disclaimers such as stating that the particular character looked correct to them or referencing their little knowledge:

- Sl2 "[hesitation] The rest of the character looks… no, usually this *person* is also on the left side."
- S2l "This element, I always see it on the other side, maybe I know too few characters."
- S25 "The fifth character doesn't look too correct for me, these two strokes on the left, or maybe after all it could be correct, I'm not sure."

On the other hand, some of the participants showed greater confidence, giving strong "matter of fact" statements, quickly pointing out mistakes, and being more sure of their choices:

- Sl4 "I might not know it all, but from my current knowledge I can say that they [elements] don't show up in this kind of place by themselves."
- Sl6 "Solely from the fact that usually *water drops* are on the left side of a character, it's a thing I simply remember since the first classes."
- S2l "At a first glance, the top part of this character is incorrect, I mean that stroke, *knife*, doesn't have to be so rounded and also that *speech* looks strange."

In one case (S12), a participant would not analyze characters one by one, but rather focus and comment on certain characters that they deemed incorrect.

Theme Four: Strokes

Although comments on strokes were not prevalent in the responses from intermediate learners, some of them did mention strokes. The strokes could

also be a reason why the participant decided that the particular character was incorrect:

- S15 "I don't know if it's a matter of stylistics, but this stroke should be horizontal."
- S21 "This falling left and downwards stroke is OK, but it should be sticking more closely to this vertical stroke."
- S25 "This stroke at the bottom seems too long to me."

　　While commenting on strokes, intermediate learners also mentioned the strokes with direct reference to the elements, in some cases exhibiting knowledge how a single stroke can change one element into another one:

- S16 "This character is almost perfectly complete, it misses one dot though, but maybe it could exist with *ice* [referring to *ice* and *water* elements]."
- S21 "This second character, *nü woman*, it not written completely correctly, I would write it in this way [writes the element]."
- S21 "At a first glance, the top part of this character is incorrect, I mean that stroke, *knife* doesn't have to be so rounded and also that *speech* looks strange [not mentioning the incorrect position of elements]."

Advanced

Table 6

Advanced Learners' Responses on Pseudo-character Correctness[8]

Stimuli	PC1	PC2	PC3	PC4	PC5	PC6	PC7	PC8	PC9	PC10
Correct	0	10	10	0	1	10	0	8	1	6
Incorrect	10	0	0	10	9	0	10	2	9	4
Strokes	0	1	0	0	0	0	0	0	0	4

Table 7

Detailed Answers with Learners' Comments on Strokes Marked in Grey[9]

Participant	PC1	PC2	PC3	PC4	PC5	PC6	PC7	PC8	PC9	PC10
T 11	I	C	C	I	I	C	I	C	C	C
T 12	I	C	C	I	I	C	I	C	I	I
T 13	I	C	C	I	I	C	I	I	I	C

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[8] Key: PC: pseudo-character, C: character, number refers to Figure 1.

[9] Key: PC: pseudo-character, C: character number refers to Figure 1; T: third year of study, number refers to particular participant (numbers starting with 1: 800+ hours of instruction); I: incorrect, C: correct.

Participant	PC1	PC2	PC3	PC4	PC5	PC6	PC7	PC8	PC9	PC10
T 14	I	C	C	I	I	C	I	C	I	I
T 15	I	C	C	I	I	C	I	I	I	I
T 16	I	C	C	I	C	C	I	C	I	I
T 17	I	C	C	I	I	C	I	C	I	C
T 18	I	C	C	I	I	C	I	C	I	C
T 19	I	C	C	I	I	C	I	C	I	C
T 110	I	C	C	I	I	C	I	C	I	C

There were a total of ten participants at the advanced level, all of whom identified as female. The age range of the participants was 20 to 29 years, with a median age of 21 years and a mean age of 22.40 years. The results of the task conducted on advanced learners can be seen in Table 6, which presents general responses, and Table 7, which presents detailed responses of the participants. What is noticeable, in both Table 6 and Table 7, the comments concerning character strokes are sparse, while four out of five comments concern the pseudo-character 10. All participants decided that C6 is correct. Participants comments did not differ between C6 and pseudo-characters. In general, four themes were identified in the case of advanced learners: elements, structure, strokes, and certainty. These themes are described in detail in the following sections.

Theme One: Elements

The advanced level learners showed extensive knowledge when it comes to the correct position of the character elements, especially when it came to the semantic elements. While sometimes they would refer to the elements simply by pointing at them and not elaborating on their names, they would rightly adjust their position:
- Tl1 "This one is usually in the middle or at the bottom, it shouldn't be here."
- Tl8 "The fourth one doesn't do it for me, I would change it, the left element I would put on the right side if anything."
- Tl9 "The next element… next character [correcting themselves] looks correct because this element [referring to the *heart* element] appearing on the left side is correct."

However, participants often recognized and used the correct names of the elements they were referring to. Advanced level learners mentioned the following elements: *water* [氵], *erson* [亻], *heart* [心], *heart* [忄], *speech* [讠], *roof* [宀], *knife* [刂], *hand* [扌], *ice* [冫], *fish* [鱼], *grass* [艹], *sun* [日], *big* [大], *woman* [女]. The examples of participants commenting on the elements are as follows:
- Tl2 "I've never seen *heart* at the very top, [only] in the middle or at the bottom."

- T13 "It looks correct, there is *hand* in its place, everything that is on the right can be there, *grass*, *day*, *big*, I can't see any mistakes."
- T15 "I know that these two [strokes] mean *ice* and that one is *fish*."

What is interesting, two of the participants during their elaboration on the characters correctness used the term "semantic element"—most of the participants would simply say "element" or "radical":

- T13 "This is semantic element and it should be on the left."
- T18 "So, this first one is incorrect, here on the right there are *three drops of water*, and it is usually a semantic element and it appears on the left."

Although it was not the objective of the task, one of the participants tried to infer the meaning of the whole character from the recognized elements:

- T18 "The last one… it can be [correct], I don't know it, it could mean frozen fish."

Theme Two: General Structure

Advanced learners often made comments about the general structure and layout of the characters, commenting on how the character elements fit or do not fit each other. In some cases, they would include an explanation how they would fix the incorrect structure of the elements:

- T12 "The second one seems ok, everything fits."
- T17 "This one seems to be fine in terms of the layout."
- T18 "The second seems totally mixed, if it comes to, uuh, I haven't seen a character which would have that *speech* element under the *roof*, and if it was to function, I would exchange the position of the elements under the *roof* with each other."

In some cases, participants would not point to the elements of the character, instead referring to the general feeling the particular character was giving them or commenting that the whole character looked 'good' or 'bad':

- T11 "Hmmm… that last character also doesn't look too good."
- T13 "This is bad, it's strangely written, this thing here."
- T17 "I haven't seen a character like that, but it's probably ok, it doesn't look super bad or anything."

Theme Three: Strokes

While the strokes themselves did come up sparsely in the participants' comments, it is still worth noting that four out of five comments concerning them were made while analyzing the tenth pseudo-character. Apart from pseudo-character 10, stroke correctness was not a factor in deciding whether the whole character is correct or not. It is also worth noting that the comments concerning strokes were directly connected to the elements:

- Tl2 "And this one here, if *fish* is on the right, it should have a straight stroke."
- Tl3 "I'm trying to remember if in the *niang* character [娘], there was a dot at the top."
- Tl6 "If there is nothing after it then this stroke here should be straight not diagonal [referring to the bottom stroke of *fish* element of PCl0]."

The only instance when an incorrect stroke was the reason for stating that a character is incorrect was the case of PC10—each participant that decided that this pseudo-character was incorrect did so due to the bottom stroke of the *fish* element of this character.

Theme Four: Certainty

There was little to no hesitation in the answers of advanced learners; participants also took little to no time reflecting on their responses and moving quickly through the entire task. Some of the participants would skip characters that they consider correct:

- Tl4 "The second one is written correctly, [moves to the next one] this one too, [moves to the next one] this one is not, because the radical should be here, [moves to the next one] this one is also incorrect because it should be on this side."
- Tl6 "In the first place, this [laugh], not on this side, so incorrect."
- Tl7 "This one seems fine if it comes to the layout, [moves to next one] this *speech* here is good, [moves to next one] I would place *heart* on the bottom, it's not ok."

The participants were also rather confident about their knowledge, often stating that the particular element always appeared in a certain position, sometimes referencing other characters as examples. In some cases, the participants stated that they had not seen a character like that, but they still considered a character correct based on their current knowledge:

- Tl3 "This character also looks correct, there is *standing heart* on the left side, there is no problem, that component [referring to the right side of PC3] I remember [it] from the *jian* [检] character from the word *jiance* [检测]."
- Tl9 "This character, the second one, it seems correct, because these two elements, from what I remember, can be on both sides of the character, there is no rule that *nü* element has to be on the left or right side only."
- T20 "Correct, but I've never seen a collocation like this."

Discussion

In this section, the following aspects of the study are summarized and discussed. First, the development of graphemic awareness of Chinese as a foreign language learner, specifically the knowledge of strokes, elements of character, and character structure, is addressed. The answers to research questions are also addressed in this section. The first subsection discusses the changes of learners' perception of characters, progressing from focusing on strokes to elements of character and overall character structure, as their language proficiency improves. The subsequent subsection presents the conclusions regarding the development of graphemic awareness of Chinese writing system of foreign language learners coming from an alphabetic language background. Finally, the effectiveness of the chosen research method, particularly the think-aloud protocol, is discussed, followed by an overview of the limitations of the current study and possible future research directions.

Changing Perception: Shifting Focus from Strokes to Elements and Structure

As shown in the Results section, there was a notable shift in the responses. The beginners focused first and foremost on the strokes; they often mentioned stroke angles, lengths, and positional relation to other strokes. While beginners sometimes mentioned the general visual outlook of particular characters, they still focused on strokes. In some cases, for example PC4, the only mentioned reason for deciding the character was incorrect was the strokes—not the incorrect position of the *person* element [亻]. It was noticeable that beginners would often start from the stroke analysis and only afterwards mention the elements.

This pattern changes when examining the responses of intermediate level learners—the most striking difference revealed was that more than half of intermediate learners did not mention strokes. They tended to focus more on general character structure and position of the elements. Nevertheless, some of the participants did mention strokes in their reasoning, and in some rare cases the strokes could be a reason why the character was deemed incorrect. What was also beginning to show in intermediate learners' answers and was more prevalent in advanced-level learners' answers was the fact that while commenting on the strokes, learners would do it in direct connection to the character elements. As for the advanced level learners, they only mentioned strokes in a few cases, in connection to the bigger structure and position of the element. An example of this is PC10: advanced-level learners who decided the character was incorrect did so due to the bottom stroke of the *fish* element [鱼].

Overall, the results show that the learners' attention gradually shifted from the strokes to character elements and their overall structure. The reasons for that change may be the following: along with more experience with the Chinese language and exposure to Chinese characters, learners develop the metalinguistic graphemic awareness implicitly, remembering the repeatable patterns as well as internalizing the rules that they were taught explicitly during Chinese writing classes. Learners also get more exposure to the handwritten characters and the differences between handwritten and printed characters—some aspects of the strokes and relations between them stop being perceived as errors and start being perceived as acceptable mistakes or variants of a character. It can be particularly seen in the answers of advanced-level learners as they pay attention to strokes when they could make a difference between characters.

The present study provides insight on the process of how learners' experience of Chinese characters changes along with the development of their graphemic awareness and increasing language proficiency. Similar to the case of native Chinese children learning Chinese characters described by Lam (2010), from the phenomenographic perspective, learners of Chinese as a foreign language also need to be aware of critical aspects of characters in order to use them proficiently. The present study results reveal that learners first attempt to distinguish as many aspects of the character as possible (focusing on strokes), then they gradually shift their attention to the critical orthographic aspects that differentiate characters or allow to distinguish between correct and incorrect characters. This shift in learners' perception could allow them to perceive Chinese characters in a more efficient manner: only paying attention to their critical aspects.

Graphemic Awareness: Knowledge of Elements and Character Structure

During the current study, it was possible to observe how the number of comments regarding both elements and structure gradually rose along with the level of proficiency. Beginners mentioned elements less often than intermediate and advanced learners, as they focused mainly on the strokes. The attention of intermediate learners turned to character elements, but they sometimes forgot their names or mistook them for others. The advanced level learners demonstrated extensive knowledge of the elements in the case of both their position and meaning. Interestingly, learners themselves were overall aware of their knowledge—beginners took more time solving the task, often hesitated, and used phrases that pointed to their limited knowledge; on the other hand, intermediate learners were also sometimes uncertain of their answers and would use disclaimers, but they also exhibited more confidence in their answers;

advanced learners showed very little hesitation, answered quickly, and mostly gave "matter-of-fact" statements.

The difference in level of graphemic awareness could also be considered in regard to the structure of the characters. Beginners rarely commented on the structure on the level of individual elements. Intermediate-level learners commented on the general layout of the character, whether or not a particular element fits with others in a character. The comments concerning the structure sometimes were not based on logical reasoning but on the feeling about the particular character. The comments of the advanced learners were similar to those of the intermediate learners, but they explained their choices based on knowledge rather than their feelings. What is noticeable here is the change in perception of characters—from combination of strokes to combination of elements.

These results are in line with those obtained by Wang et al. (2004), as learners exhibited the sensitivity to character internal structure and quickly learned the correct position of individual elements. The results are also consistent with the trends reported by Loh et al. (2018) concerning quick development of element awareness as well as the positive influence of explicit instruction. Shen and Ke (2007) also showed in their research that beginner learners quickly become aware of the complexity of character structure, even when their knowledge of the elements is still limited.

Although this study confirmed the results of previous research, there is a difference in the way beginners who participated in the study perceived characters. In most works it is often claimed that beginners perceive characters as a whole rather as a set of parts (e.g., Shen & Ke, 2007). However, in the current study even learners with the least experience seem to be perceiving the characters as sets of strokes rather than as an indivisible whole. The reason for this quick development might be both the presence of Chinese writing classes in the curriculum and the explicit instruction. While Loh et al. (2018) stated that the knowledge on elements of characters and the correctness of their position is implicit and difficult to acquire, it seems that explicit instruction facilitates the development of graphemic awareness. What might also be an important factor is the exposure to enough characters for learners to internalize the rules of the Chinese writing system that have been taught explicitly.

Effectiveness of the Think-Aloud Protocol

The think-aloud protocol used during the current study proved to be an effective way to gain insight into the reasoning of the learners. Although learners of different proficiency levels provided the same responses in some cases, the chosen data collection method allowed for the determination of differences

in learners' reasoning behind a particular answer. Examples of such characters are: PC1, PC2, PC3, PC4—with strokes and not the position of individual elements being the reason for deciding a character was incorrect. The think-aloud protocol also allowed to differentiate reasons of learners who decided PC10 was incorrect: for example, beginner and intermediate learners would point to the left element wanting to correct it into *three water drops*, while advanced learners would point to the bottom stroke of the right element. There have been no previous studies exploring the underlying reasons for participants to determine the correctness of presented stimuli. Therefore, it would be beneficial to employ the think-aloud protocol in further research to gather additional data and validate the findings of the current study.

Limitations of the Study and the Directions of Future Research

The current study was limited to a specific type of learner of Chinese as a foreign language—all participants were students of Chinese language majors at university level. While none of the participants had significant prior experience learning the Chinese language, their curriculum included classes on the Chinese writing system. The quick development of graphemic awareness and perception of characters as sets of strokes in the case of beginner learners might be due to the university curriculum. Further studies are needed to investigate the role of instruction to better understand the process of explicit and implicit learning. It would be interesting to compare how graphemic awareness develops without explicit instruction and how learners within such an environment perceive characters. Another question that remains unanswered is how quickly beginner learners start to perceive characters as sets of strokes rather than indivisible units, as in the current study, the first group of beginner learners had already received about 100 hours of Chinese language instruction. Further research could focus on exploring in detail the development of graphemic awareness in this short initial period.

Conclusions

The results of this study reveal changing patterns in the perception of Chinese characters in the learners of Chinese as a foreign language. It was determined that beginner level learners perceive characters mostly as stroke clusters, while intermediate and advanced level learners shift their focus to individual elements and the overall character structure. Perception of what is

an error also changes, which is possibly due to more exposure to and under-standing of the possible variations of handwritten characters. The conclusion can be drawn that the described shift in learners' perception is a result of them learning to direct their attention towards the critical orthographic aspects of the characters. The present study has also highlighted the importance of using a qualitative approach as it was possible to collect new significant data on the topic of metalinguistic orthographic awareness of Chinese writing system with the use of think-aloud protocol.

The findings of this study have several implications for the pedagogy of Chinese and the Chinese writing system. Firstly, the study confirmed that graphemic awareness develops rapidly among learners of Chinese as a for-eign language, even those without prior experience with Chinese characters. Secondly, the explicit instruction of elements and structure of characters ap-pears to facilitate and accelerate the development of graphemic awareness. It would be beneficial to direct learners' attention towards the significant relation-ships between strokes in characters that result in character changes, enabling them to identify the focal parts of characters. Learners' attention should be also directed towards graphically similar elements of characters, highlighting their differences to improve their ability to distinguish them. Explicit instruction on strokes, elements, and character structures, as well as exercises, such as distinguishing graphically similar characters or pseudo-characters, are not the only things that benefit the development of graphemic awareness of the Chinese writing system—correcting mistakes in strokes or elements, and categorizing characters based on their structure or elements can also play a beneficial role. Additional research comparing groups of learners that are not taught explicitly the rules of Chinese writing would help to determine the possible beneficial influence of the instruction on graphemic awareness development.

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Zuzanna Wnuk

Entwicklung des graphemischen Bewusstseins polnischer Lerner von Chinesisch als Fremdsprache

Zusammenfassung

Das metalinguistische orthografische Bewusstsein spielt eine entscheidende Rolle bei der Entwicklung von Sprachkompetenzen in Chinesisch: Schreiben, Lesen und Lernen neuer Wörter. Es gibt allerdings nur wenige Studien, die dieses Thema mit qualitativen Methoden untersucht haben. Ziel der vorliegenden Arbeit ist es, zu erforschen, wie sich die Wahrnehmung chinesischer Schriftzeichen durch Fremdsprachenlerner im Zusammenhang mit ihrem Sprachniveau verändert. Die Antworten wurden von 43 polnischen Chinesischstudenten mit Hilfe eines Tests des graphemischen Bewusstseins gesammelt, bei dem die Teilnehmer über die Korrektheit der präsentierten Pseudozeichen entscheiden sollten. Die Ergebnisse der Studie zeigen, dass sich Anfänger in erster Linie auf die Korrektheit der Striche konzentrieren, während sich die Aufmerksamkeit der fortgeschrittenen Lernenden auf die Zeichenelemente und deren korrekte Position verlagert, so dass sie die Zeichen unter Berücksichtigung sowohl der Zeichenelemente als auch der Struktur der Zeichen analysieren. Es wird vermutet, dass die insgesamt rasche Entwicklung des graphemischen Bewusstseins in der Lerngruppe auf den expliziten Unterricht zurückzuführen sein könnte. Daraus lässt sich schließen, dass sich die beschriebene Veränderung in der Wahrnehmung der Lernenden daraus ergibt, gelernt zu haben, ihre Aufmerksamkeit auf die kritischen orthografischen Aspekte der Zeichen zu richten.

Schlüsselwörter: chinesische Schriftzeichen, Chinesisch als Fremdsprache, Lernen chinesischer Schriftzeichen, metalinguistisches Bewusstsein, graphemisches Bewusstsein