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A multimodal approach to the technological representations in CFL textbooks

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The study scrutinizes the intermodal relations and interactive meaning-making of the textual and visual semiotics involved in modern technology representation, which indicates the engagement of authentic communication in language learning. The findings show that both textbooks show attempts to capture the up-to-date technology of modern life. Learners tend to be involved with the interpretation of the indexical relations between the visual and textual resources in one textbook, while the other textbook consists of a few texts and images that are not indexically related and are less likely to be interpreted interactively. Findings indicate the importance of being aware of the different emphases of these two textbooks through multimodal research, for the purpose of effective adaptations in CFL teaching and learning.

Keywords: textbook, multimodality, technology, Chinese as a foreign language

1. Introduction

Language textbooks generally consist of written texts and images. With technological advances, both the quality and frequency of images in textbooks have improved. While language textbooks have always used both text and images, applied linguists tend to focus more on the examination of the textual content (Kress, 2000). Some studies have, however, examined the delivery of information through a combination of different modes of communication (Chen, 2009, 2010a & 2010b; Poyas & Eilam, 2012; Weninger & Kiss, 2013).

Textbooks are usually among the core resources for foreign language pedagogy, especially when teaching and learning a language as difficult as Chinese (Kubler, 2020). It is important that they reflect the modern life which learners can relate to, and that they contextualize the study of the target language. The definition of ‘textbook’ has not been a fixed one, especially with the evolution of technology. It has changed from referring to printed words to “a mixture of multimodal resources, including language, image, font, layout, colour and spatiality” (Ajayi, 2012). The notional shift in meaning has led to a change in the

design and use of multimodal textbooks. The current study is situated in the theoretical domain of multimodality, in order to investigate how language textbooks incorporate linguistic and visual information to prepare learners to confidently use a language in contemporary society. In doing so, it explores the extent to which textbooks reflect modern social practices such as communication with mobile technologies.

Although the integration of our daily communication with technology is visible in the digital era, the way in which this important aspect of modern life is presented in textbooks for foreign language learning has not been fully examined. Indeed, from a publisher's perspective, it is important for a textbook to keep pace with technological changes to avoid losing its audience due to a lack of authentic material. In addition, in contrast to the wide range of research on English as a foreign language (EFL) textbooks, relatively few studies focus on the analysis of textbooks for Chinese as a foreign language (henceforth CFL; Bewley, 2018; Gong, Lyu, & Gao, 2018). In addition, there is comparatively little research concentrating on the interconnections between image and text when analyzing language textbooks (Weninger, 2021).

Therefore, this study looks into how technology is embedded in the semiotic resources of two CFL textbooks. It also examines whether and to what extent the deployment of different semiotic resources allows potential for the reflection and interpretation of modern life.

This study first presents the need for a study of CFL textbooks through the contrast between the increasing amount of CFL learning material and the scarcity of CFL textbook research. Previous findings on foreign language textbooks are also presented, to shed light on the current CFL textbook analysis. Multimodal discourse analysis is then discussed, with a focus on the typology of index, examining possible interconnectedness of co-deployments of image and text. Integrated with three voices used in previous research, this study scrutinizes the interactive multimodal resources in CFL textbooks against a heteroglossic backdrop. The depiction of digital and interactive technology in two language textbooks is investigated, in order to see the authentic engagement with modern life in CFL learning. This study entails an in-depth discussion of authentic representation and flexible use of technological instances in CFL textbooks, which may provide insights into the design and use of pedagogical materials in modern life.

2. Previous textbook research: CFL and other foreign languages

In line with the growth in the number of CFL learners (Gil, 2017; Osborne, Zhang, & Zhang, 2018; Tinsley & Board, 2017; G. X. Zhang & Li, 2020), a wide range of CFL learning materials, including textbooks, has been developed. The Global Chinese Teaching Material E-Library¹ indicates that 14,901 CFL textbooks were published between 2001 and 2010 (Zhou, Bo, Wang, & Li, 2017). Previous studies of these textbooks can generally be categorized into two types. At the macro level, research has been conducted to provide an overview of CFL textbook development (e.g., Li & Gong, 2015; Liu & Jiang, 2015; Wang, 2016; Zhou et al., 2017). These studies have tended to scrutinize the overall changes in textbook design, including the features, functions and significance of these Chinese language teaching materials. For instance, Li and Gong (2015) examine the characteristics and scopes of application of four types of CFL textbooks,² whereas Wang (2016) scrutinizes the national identity embedded in the discourse in CFL textbooks and calls for open discourse for an intercultural understanding. Zhou et al. (2017) suggest the facilitating effects of CFL teaching material on Chinese teaching and acquisition research through an introduction of the construction and application of the corpus of Chinese teaching materials for non-native speakers. At the micro level, textbooks have tended to be treated as traditional literary texts, with the examination usually focusing on written texts only. Topics include, for instance, the order of introducing different grammar aspects in CFL textbooks (W. Lu, 2002), various modes of presenting the meaning of new words (Wang, 2009), and the localization of CFL textbooks (Luo & Zhang, 2014).

There seems to be a scarcity of research that takes into account both images and words in order to examine CFL textbooks in a multimodal way. For instance, in a study of cultural representations in a Chinese textbook, Liu (2014) only briefly mentions the frequency counts of pictures used in the textbook. No further analysis is conducted to show how the pictures are integrated with the written texts for cultural representation.

Nevertheless, previous research on pedagogical materials of foreign languages in general offers insights into the current multimodal analysis of CFL textbooks. Building upon the premise that to learn a language is ultimately to be capable of performing in the target culture, the performed culture approach for East Asian languages focuses on the cultural contexts and components in the pedagogical material development application (Christensen & Warnick, 2006). It consequently places the emphasis on the importance of developing authentic pedagogical materials, in order to maximize the exposure to authentic language and cultural context (Christensen & Warnick, 2006).

Based on this notion, authenticity has been brought to attention in the development and evaluation of pedagogical materials, including textbooks. Although ‘authentic materials’ conventionally refers to the use of the target language by, and products for, native speakers, Noda (2003a, p. 202) points out that this definition invalidates authenticity in a pedagogical context where authentic reading is “determined not only by the text, but also by what readers do with the text”. Tomlinson (2012) underscores that the essential element to define an authentic text is whether it has been produced for communication, rather than whether it has been produced by a native speaker. Despite not being a real-life task, a classroom task can be considered authentic if it involves learners and “the use of real life skills in order to achieve not just communication but a non-linguistic outcome” (Tomlinson, 2012, p. 162).

Noda further outlines two types of authenticity: authenticity of form, and authenticity of context and purpose (2003b). The former indicates “whether the language, the orthography, and the general appearance of the text used are authentic” (Noda, 2003b, p. 234). It goes beyond the traditional definition of authentic material – which mainly emphasizes the language – by including orthographic authenticity (e.g., the use of Chinese characters or pinyin) and overall appearance (e.g., line orientation, character size, the use of visual images).

The authenticity of context and purpose is to do with “the feasibility of the text having a social meaning” (Noda, 2003b, p. 234), which suggests the likelihood of the material being used in a natural context or the real world. In other words, instead of being treated as still and static, the interactivity and interplay of pedagogical material with its users are highlighted in this definition of authenticity.

In addition, Kubler (2020) points out that one of the key limitations of textbooks is that they can become outdated, especially if current events are included. Therefore, flexibility plays an important role in textbook development (Kubler, 2020) and evaluation (McDonough & Shaw, 2003). Since it means options can be left open for localization and personalization, in order to anticipate the needs of students and teachers (Tomlinson, 2012), it is also linked with adaptability in pedagogical materials. Adaptation contributes to achieving “the optimal congruence between materials, methodology, learners, objectives, the target language and the teacher’s personality and teaching style” (Tomlinson, 2012, p. 151). Besides, adapting existing materials is an effective use of the time and money involved in pedagogical material development (Kubler, 2020).

Specific to Chinese, there tend to be uneven developments in oral and written skills at the beginner level. The logographic nature of Chinese script makes it different to the European

alphabetic languages in the way that learners need to map both the grapheme-phoneme and grapheme-morpheme correspondences (R. Lu, 2020). However, characters do not provide systematic and reliable grapheme-phoneme correspondences (Q. Zhang & Reilly, 2015), which further makes it labor-intensive and time-consuming to learn Chinese characters.

There has been discussion in relation to the timing of introducing characters to beginners (Knell & West, 2017; Osborne et al., 2018; Ye, 2013), which engenders a decision between single-track and dual-track material development for four language skills (Kubler, 2020). While separate tracks might be useful when reading and writing skills of beginner learners are normally behind speaking and listening, it is still vital to offer maximum flexibility to allow learners to “begin the written skills at whichever point is appropriate, or not at all” (Kubler, 2020, p. 330).

Besides, because of the heavy cognitive and physical workload of handwriting, the usefulness of learning to write characters by hand in the digital age has been questioned (Allen, 2008; Q. Zhang & Lu, 2014). Although evidence shows that handwriting can contribute to reading development in Chinese (Cao et al., 2013; Guan, Liu, Chan, Ye, & Perfetti, 2011; Q. Zhang & Reilly, 2015), it has been suggested that typing with input software be introduced, in order to equip CFL learners with the ability to communicate in contemporary life (Q. Zhang & Min, 2019; Zhu, Shum, Tse, & Liu, 2016). The ease of typing Chinese may help writing skills catch up with oral skills.

Therefore, with a spotlight on technology, this study looks at flexibility from two perspectives: a) while textbooks are unlikely to be frequently updated to keep pace with technological upgrades, up-to-date technological representations would best allow material adaptations to encourage authentic communication; b) handwriting is still generally necessary at the beginner level, while typing with input software could be supported if learners and teachers would like to have the option. In other words, flexibility will be looked at from the perspective of how technological representations can be adapted into technologically involved tasks and activities, while also being up to date and able to support typing.

3. Multimodal approach to textbook analysis

Building upon Halliday’s systemic functional linguistics (Halliday, 1978), multimodality takes into account the complexity of meaning development through various semiotic resources (Iedema, 2003; Poyas & Eilam, 2012), and therefore multimodal discourse analysis

(hereafter MDA) engages the multimodal dimension of semiotics (Jones, 2012; O'Halloran, 2011).

Printed foreign language textbooks nowadays tend to consist of at least two semiotic resources, i.e., words and images. As a result, MDA, which studies meaning-making based on a combination of multisemiotic phenomena (O'Halloran, 2011), is one of the useful approaches to analyzing these textbooks. However, very few attempts have been made to scrutinize the coexistence of semiotic modes in EFL textbooks (Weninger & Kiss, 2015). Even fewer, perhaps none, have examined the contribution of images in CFL pedagogic materials to language learning, as noted earlier. This study employs multimodal discourse analysis to examine the content of CFL textbooks and their intended ways of working (Littlejohn, 2011; Tomlinson, 2012).

In addition, a sizeable body of literature in textbook research has scrutinized images independently from texts (Weninger, 2021). Visual representations have been analyzed in isolation to the textual material, rather than looking at whether or to what extent they are connected with each other. Ajayi (2012) points out that multimodal texts can integrate diverse modes of representation of meanings and are therefore able to provoke different interpretations from language learners. Image and text can indeed be associated either explicitly or implicitly in a meaningful way in textbooks, and consequently different ways of associating between image and text can offer space for variation in interpretation.

This study employs the typology for *index*, which is a notion in the semiotic theory of Charles Sanders Peirce (Liszka, 1996; Weninger & Kiss, 2013, pp. 38–39), to examine the intermodal relations between texts and surrounding images. Basically, there are three inter-related parts in this theory: a sign (also known as a representamen, a sign vehicle), an object and an interpretant (Atkin, 2013; Chandler, 2007, pp. 29–31). An object is what the sign represents and the interpretant is what the sign makes sense of (ibid.). The representation of a sign can be through continuity with its object, i.e., an index (Liszka, 1996, p. 39). The index has also been developed into the linguistic concept of *indexicality* (Eckert, 2008; Silverstein, 2003), which is used to approach social meanings in conjunction with the associated linguistic variations.

An index consists of three types. The *causal* continuity of the sign with its object refers to the fact that “the index is caused by the object it represents” (Liszka, 1996, p. 39), such as tree branches being pushed by the wind. The *deictic* type indicates “a direct continuity between the sign and its object” (Liszka, 1996, p. 39), such as a pointing finger and the object it is referring to. The *labeling*, as the term suggests, directly leads the index to an object, as

shown in a proper noun indicating a person.

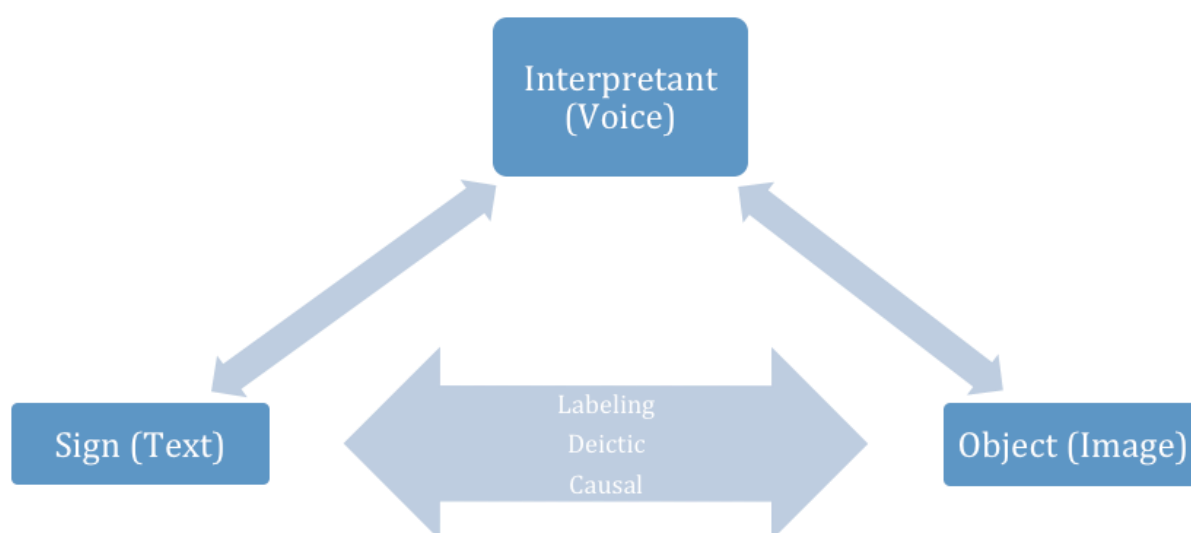


Figure 1. Visualization of the relationship between Sign and Object (adapted from Chandler, 2007, p.30).

Figure 1 demonstrates the causal or proximal relationship between sign and object, through three types of index. This study applies the notions in the research of semiotic theories to the examination of the three kinds of associations between image and text in CFL textbooks. In this case, we can see the intermodal correlations between two semiotic resources that are created in the language learning process. For example, a labeling index usually suggests a relatively fixed and static relationship between the visual and textual resources, while a deictic or causal index tends to open space for readers to interpret the word and the picture.

Foreign language textbooks, especially those for low-proficiency learners such as beginners, are also featured, as their dialogic nature and the multimodal resources exist in this heteroglossic setting (Chen, 2010a). Chen (2010a), one of the pioneers in looking at the interconnections between the visual and textual semiotics in language textbooks (Weninger, 2021), identifies three voices against the heteroglossic backdrop of EFL textbook discourse which are also applicable to the current study: editor voice, character voice, and reader voice.

Editor voice is usually present in section titles such as ‘Listen and Repeat’ or ‘Reading Comprehension.’ The imperative clauses or nominal groups in which the editorial voice is embedded actually engage the reader in a dialogic exchange. They instruct and encourage the reader to do what is specified in the section titles. Character voice refers to the dialogues

between cartoon characters used in textbooks. It is usually shown in both visual and textual forms, having the characters next to the utterance. Reader voice can be found in language tasks that require the reader's active involvement. For example, any gap-filling exercise that asks the reader to complete a word, a sentence, or a conversation is expected to involve reader participation to jointly construct a text with the editor and/or character.

This study integrates the typology of index with the notion of voice to examine the multimodal semiotics in language textbooks. As shown in Figure 1, the three voices are adopted as the analytical unit to show the interpretant generated in the deployment of semiotic modes – namely, which voice is involved to make sense of the interaction between different semiotic resources. Indeed, Weninger (2021, p. 140) points out that learners' interpretations of images and texts are usually guided rather than free, as are their responses, which are generally “in the manner set by the textbook”. However, this does not mean textbooks are only static objects and language learners mere passive addressees. The three voices offer the possibility of examining the heteroglossic nature of the coexistence of multimodal resources. Specific to this study, a voice is used to understand who is engaged with visual and textual resources, in order to make a certain interpretation of the deployment of image and text – even though this may be suggested by the textbook through part of a task or activity.

As commercial products, it is unlikely that foreign language textbooks can be kept completely up to date with modern society, which is changing rapidly itself. Using technological changes as an example, touchscreen smartphones were introduced for personal use in the late 2000s, and it took approximately five years for them to become commonly used in daily life. The fast development of technology leads to changes in lifestyle, including communication, which may not be accurately and explicitly captured in foreign language textbooks. Instead, publishers may wish to include visual and textual information that does not go out of date so quickly, so that a new edition is not needed every three to four years.

However, this does not mean a textbook cannot be set in a real-life context and consequently be used to reflect authentic communication. Using technology as a representative of modern life, this study focuses on the interpretation of semiotic potential in the heteroglossic setting, in order to understand whether and to what extent modern life is engaged in the language learning through multimodal resources in CFL textbooks.

Rather than evaluating and measuring “the potential or actual effects of the materials on their users” (Tomlinson, 2012, p. 148), this research is concerned with the textbook as the primary object of the examination. It employs the typology of index as the coding framework

when conducting a multimodal analysis of the technology depicted in the two CFL language textbooks. ‘Technology’ refers to any digital and communication technology (e.g., mobile phone, laptop) as well as interactive and social technology (e.g., texting and online chatting) that is commonly encountered and engaged with by readers of these textbooks in their daily life. Instead of only treating textbooks as representational repertoires (Gray, 2010; Weninger, 2021), this research focuses on interactive meaning-making through textual objects – such as linguistic choices – and images of technology, to investigate the impact their deployment may have on the readers – namely, learners and teachers – to engage with modern life. An in-depth investigation of the intermodal representation of these technologies and their interactivity can therefore reveal how authentic interpersonal communication is captured in these textbooks and how its use is encouraged in language learning.

4. Data and methods

Using the framework described above, the CFL textbooks chosen for this project were scrutinized and manually coded by two research assistants. The coding was then read in detail by a researcher independently, with only a few instances of technology coded differently in relation to the communication technology. After reviewing the working definition of technology in this project, a consistent strategy was adopted for streamlining the coding of all instances referring to communication technology. Namely, a) the coding of technology in CFL textbooks refers to any description of them in textual or visual mode, or in both; b) any other relatively outdated technology which has been available for decades and has not been revolutionarily changed, e.g., television, landline phone, CD player, radio, is excluded from the analysis; c) any mention of a landline is not included, as stated earlier, but any general reference to a phone (e.g., the phrase ‘phone number’) is otherwise included, since it can be interpreted as relevant to a mobile technology, such as a mobile phone number.

Two textbooks were chosen for this study. The key criterion for their selection was their comparability from the following perspectives: a) the level of language proficiency, b) the potential learners in terms of age, c) the main teaching approach, and d) contemporary relevance, meaning the textbooks were up to date. Based on this rationale, the two Chinese textbooks are Volume 1 of *New Practical Chinese Reader* (Student Book; Liu, 2015) and Student Book One of *Discover China* (Ding, Chen, & Jin, 2010). Table 1 outlines the two textbooks. Both are for English-speaking adult beginner learners of Mandarin Chinese.

Table 1. The two CFL textbooks

Textbook	Target learners	Main teaching approach	Publisher and location	Year of publication
Chinese Textbook 1 (CT1)	Adult beginners	Communicative	Beijing Language and Cultural University Press, China	2015
Chinese Textbook 2 (CT2)	Adult beginners	Communicative	Macmillan Publisher Limited and Foreign Language Teaching and Research Press, UK	2010

Chinese Textbook 1 (henceforth CT1) is a workbook series for English-speaking beginner learners, with its third edition published in 2015. The long-standing and popular series consists of six volumes. CT1 is aimed at beginner learners, while the later volumes cater to more advanced CFL communicators being taught through English (Tinnefeld-Yeh, 2014). The textbook has been compiled in line with the official Chinese language proficiency test, commonly known as the HSK (Liu, 2015). Although it is published in mainland China, it has been widely used around the world. In 2014, almost 2,000 universities across the world were using the book series to teach CFL (Tinnefeld-Yeh, 2014) and 13.5% of American universities had adopted it (Yeh, 2016), highlighting its popularity.

CT1 aims to develop CFL learners' communicative skills in Chinese, following the communicative language teaching method (Liu, 2015). It emphasizes practical language through a combination of language functions and language structures (Xie, 2012). In addition, the 2015 edition includes newly invented words, reflecting linguistic change in contemporary society (Liu, 2015; Yeh, 2016). CT1 consists of twelve units, totaling 288 pages.

Chinese Textbook 2 (henceforth CT2) is for beginner learners of Chinese. It was co-published in 2010 in the UK by Macmillan Publisher Limited and Foreign Language Teaching and Research Press, the latter being one of China's biggest educational publishers (Tinnefeld-Yeh, 2014). The book series consists of four levels; CT2 is the first of them, for complete beginners studying Chinese as a foreign language. CT2 is "a collaborative work by

a consortium of Chinese language experts and teachers from China and the UK”, aimed mainly at university students and adult learners with English as their first language (Tinnefeld-Yeh, 2014, p. 241). It employs a communicative and integrated approach to language learning and thus stresses authentic communication in real-life contexts (Ding et al., 2010). CT2 is one of the CFL textbooks widely used in higher education institutions and schools in the UK (Lu, 2017). It also consists of twelve units, totaling 177 pages. Based on the four key criteria suggested earlier, CT2 is examined in parallel with CT1 to allow comparison. Because of the scope and the qualitative nature of the current study, it is not feasible to examine a large quantity of beginner level CFL textbooks. However, an important aspect of the research is the use of a multimodal approach which can be applied in future textbook analysis.

5. Data analysis

This section will first show an overview of technological representations through the total counts of technological instances in visual and verbal semiotics in each textbook. It will then scrutinize the intermodal relations between image and text, followed by an examination of the interactive meaning-making using the notion of voice.

5.1 Instances of technology

As stated earlier, the instances of technology coded in the current research are restricted to those that are most up to date and commonly engaged with by people in contemporary society. Specifically, any references to mobile phones, laptops or the functions they provide (e.g., email, text message, online profile) are counted as instances of technological representation.

The total number of technological instances outlined in Table 2 includes the textual mode only. Although the textual instances are not the focus in this multimodal analysis, they are presented here to provide an overview of the depiction of modern technology in two textbooks. Contrary to the frequent encounters with different technologies in real life, the total number of instances of technology depicted in CT1 (N=16) is less than half of that in CT2 (N=41). The significantly higher frequency of references to digital and social technology may suggest the effort that CT2 makes to engage readers with modern life.

Table 2. Number of instances of technologies depicted in CT1 and CT2

		Laptop & desktop	Mobile & smartphone	Email & Internet	Other (e.g., wireless headphones)	Total
CT1	Visual only	10	3	0	1	14
	Textual only	0	1	0	0	1
	Both	0	0	1	0	1
	Total	10	4	1	1	16
CT2	Visual only	1	1	2	0	4
	Textual only	0	16	10	0	26
	Both	0	3	11	0	14
	Total	1	20	23	0	44

Most of the instances in CT1 are images of computers, whereas those in CT2 refer to services that people usually engage with in the digital world, including email and going online. In addition, a number of instances (N=14) in CT2 employ both visual and textual modes to depict technology, whereas CT1 predominantly relies on visual description (N=14).

5.2 Indexical relation between image and text

This section looks into the relationships between technological images and texts in a textbook, in order to examine how the textbook engages its readers with modern life through language learning. The instances of technology represented in textual mode only (see Table 2) do not accompany an image and are therefore not included in the analysis here. On the other hand, although the instances shown in visual mode only (see Table 2) suggest that no specific term of technology – such as ‘mobile phone’ or ‘Internet’ – is found in the textual resources, this does not mean the visual representation of technology has no reference to the accompanying texts. As shown in the example of the CT2 extract in Figure 3, the words ‘mobile phone’ and ‘Internet’ are not found in the text, but the section title ‘Read the profile’ suggests that the image is a character’s online profile. Therefore, further analysis of these instances is worthwhile, in order to investigate how these visual resources are used to engage learners with modern life in the process of language learning.

In short, all instances in visual mode, as well as visual and textual mode, are examined using the index typology for the relationship between the two different semiotic resources. There are 15 instances for CT1 and 18 instances for CT2 in total, as shown in Table 3.

Table 3. Overview of the relationships between images and texts

	Label	Deictic	Causal	None	Total
CT1	0	3	3	9	15
CT2	13	4	0	1	18

Images in CT2 tend to be used to label the technology mentioned in the textual resources (N=13), whereas 9 out of 15 texts and images are unlikely to be related indexically. For example, the extract on the right in Figure 2 shows that words for digital communication technology (e.g., ‘mobile’) can be used to label pictures of such technology. In contrast, the CT1 extract contains an image of a computer on the desk in front of a doctor, though the exercise itself entails a conversation in a medical context. Although the picture suggests that the doctor may need to record the patient’s symptoms in the computer, the conversation has no reference, even implicitly, to the computer input. Therefore, there is no indexical relationship between the technological sign – the desktop – and the text in close proximity. This gap-filling exercise can be completed by learners without the image.

Therefore, the relationship between the exercise and the accompanying image can be described as text enhancing (Chapelle, 2016). The picture used here – which shows a character in doctor’s white gown and another character holding his head with an expression indicating pain – is intended to contextualize the conversation in order to provide additional assistance for learners to understand the task. The computer is a modern element commonly shown in a doctor’s office and therefore appears in the image for the sake of authenticity only, with no reference to the intended language learning or pedagogic task. Indeed, in a real-life event like this, it is rare that the authentic conversation between a doctor and patient would make any reference to the computer or the doctor’s using it to record symptoms. There seems to be a lack of authenticity of context and purpose in the multimodal example for the technological piece – the desktop computer – to be used in a natural conversation, despite a relatively authentic representation of a medical scenario. This will be further discussed later.

Based on the scenes in the pictures and the context, complete the dialogues.

1 Match the pictures with the words.

(1)



大夫: _____?

宋华: 我头疼。

大夫: 先量一下体温吧。

宋华: _____?

大夫: 37 度 9, 有点儿发烧。



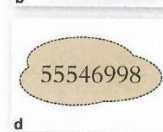
a



b



c



d

diànhuà

1 电话

shǒujī

2 手机

hàomǎ

3 号码

gōngyuán

4 公园

Figure 2. Extract from CT1 (left; no index) and CT2 (right; label index)

The examples in Figure 3 show that the visual and textual resources are related through deictic contiguity. The CT1 extract presented on the left of Figure 3 shows a woman making a call on her mobile, which corresponds to the immediate textual description on the following page: “Lin Na got lost and was in a panic phone call with Songhua asking for help.” (CT1, page 167)

The CT2 extract shows that the exercise instructs readers to look at the profile information exhibited in the image in close proximity, while the image suggests that it is a person’s online profile. In other words, the exercise instruction is denoted by the image formatted to look like an Internet browser showing an online profile.

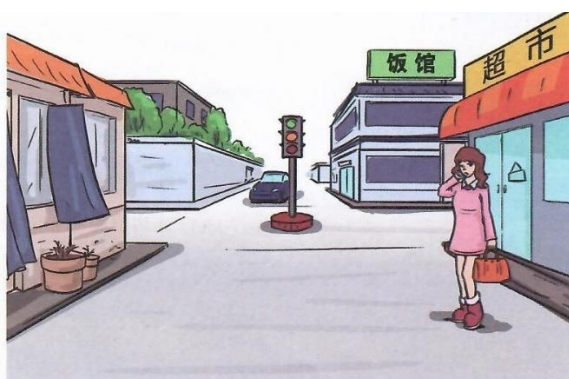


Figure 3. Extract from CT1 (left) and CT2 (right) for deictic index

In terms of causal relationship, Figure 4 is an example extracted from CT1. Although the textual information does not contain any reference to the computer shown in the image, the exercise expects readers to fill in the phrase ‘being very busy’, the state caused by working on the desktop computer. Therefore, the textual information needed for the blank can be

deciphered from the picture in close proximity. The text and the image are set in a causal relationship.

Exercise II Look at the pictures and describe what you see.

(1)



以前他不忙，现在他_____。

Figure 4. Extract from CT1 for causal index

5.3 Three voices for the interpretant

This section investigates the voices involved in multimodal cases. That is to say, only instances where text and image are linked indexically, as shown in 5.2, are taken for further examination. In addition to the indexical relations, the voice can investigate the space for engaging with technology – as representative of modern life – in a heteroglossic setting for Chinese language learning.

As shown in Table 4, none of the instances engage the reader's voice to interpret the multimodal resources in CT1. Instead, the editor or the character's voice tend to be employed to make sense of the indexical relations between image and text.

Table 4. Three voices for multimodal instances in CT1

CT1	Label	Deictic	Causal	Total
Editor	0	1	0	1
Character	0	2	3	5
Reader	0	0	0	0

Figure 5 presents examples of the use of the voice of the editor and character to interpret the indexical relations between the text and the image. On the left, the name of Chinese

search engine Baidu is mentioned in the text, with its logo in the corner. The editor's voice initiates the reading and viewing, in the hope that readers will form the appropriate indexical relationship between the written words and the image. On the right, the conversation between two people is implied in the two characters in the picture. Therefore, the character's voice is employed to establish the link between text and image.



Figure 5. Examples of the editor's voice (left) and the character's voice (right) in CT1

Regarding the instances in CT2, most of them engage the reader's voice in the interpretation of the indexical relationship between visual and textual resources (see Table 5). Therefore, readers are encouraged to initiate the sense-making between the image and the text.

Indeed, it might not always be straightforward to differentiate between the voice of editor and reader in this study. For instance, an image might be implicitly referred to in the section title "Answer Wang Yu's questions," while readers would need to take the initiative to interpret the questions presented in the image of an Internet browser (see the example on the left in Figure 6). In other words, the editor's voice does not explicitly mention the technology depicted in the image. In this case, all similar instances are counted in the category of reader's voice, because the reader's dynamic engagement is needed to associate the textual information with communication and social technology.

Table 5. Three voices for multimodal instances in CT2

CT2	Label	Deictic	Causal	Total
Editor	4	2	0	6
Character	0	0	0	0
Reader	9	2	0	11

As shown in the example on the left of Figure 6, the instruction does not specify any technical aspect of the image. However, the text is formatted in the shape of an online chatroom or a messaging application. Readers take the initiative to link the text with the image indexically while completing the exercise. The example on the right side of Figure 6 shows that although readers are also engaged in filling in the blanks with their own information, the editor has specified that the image is an online blog. In this case, the editor's voice is used to label the written instruction – 'blog' – with the image in the form of a blog post.

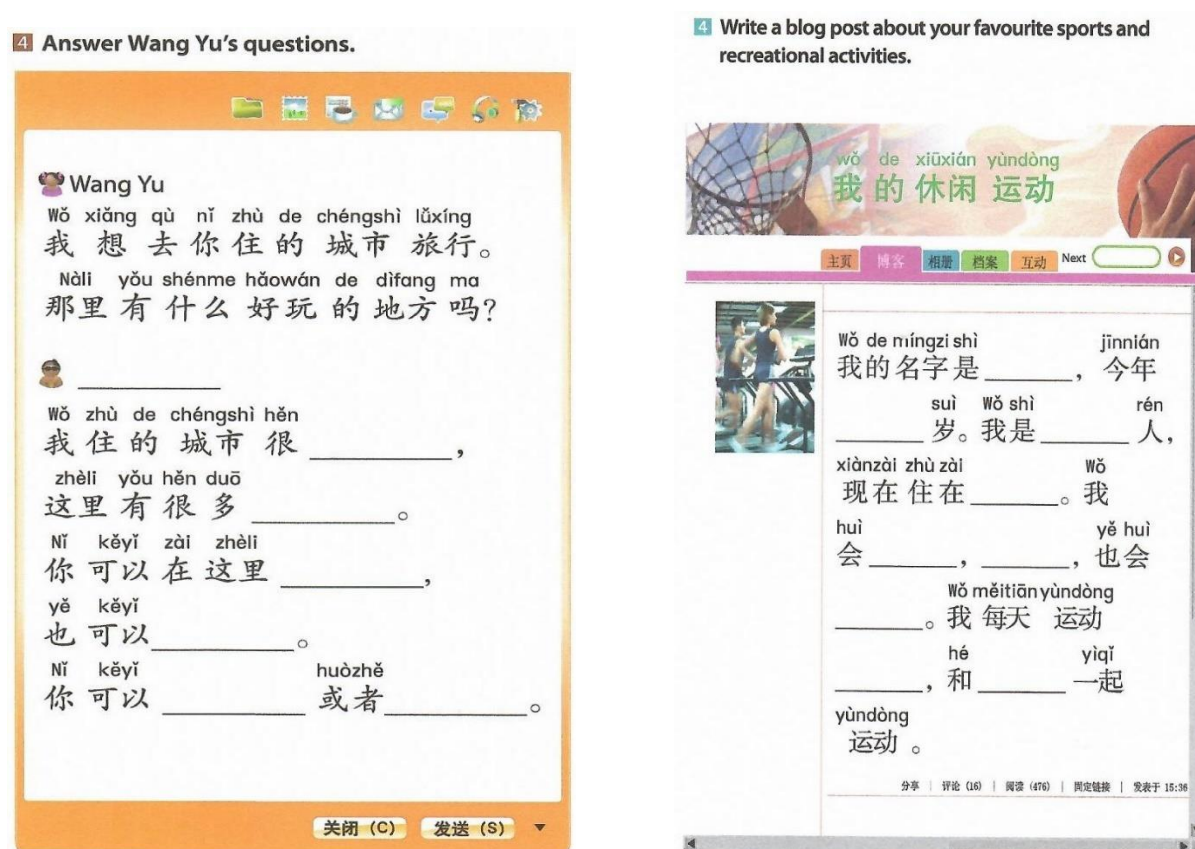


Figure 6. Examples of the reader's voice (left) and the editor's voice (right) in CT2

6. Discussion

The above analyses show three aspects from which two CFL textbooks are evaluated – the total number of technological instances, the indexical relation between text and image, and the voice for the interpretation of text and image. Both textbooks contain references to digital and interactive technology, indicating their attempts to situate CFL learning in an authentic

modern milieu. However, CT1 contains a few technological images (e.g., Figure 2) that are not indexically related to the text in close proximity.

Even the indexically related texts and images tend to provide a modern ambience rather than being integrated in language learning. For instance, Figure 4 shows a desktop computer which looks quite up to date, though the technological reference is meant only to imply the state of a person (i.e., of being busy). Despite the authentic representation of modern technology in the CFL textbook, there is little intention to create space to allow learners to engage with modern life through language learning. If the technology semiotics were taken away, the learning process would be unlikely to be severely impeded. There seems to be a lack of authenticity of context and purpose in these examples involving technological representation. The technology, namely a desktop computer, is not even mentioned in the conversations described in Figure 2 and Figure 4. In other words, the technology is part of the context or ambience where the conversations happen, but no context is provided for such technology being mentioned or used in a natural conversation depicted in these images. Noda (2003b) highlighted the importance of the interactivity and interplay of technology in pedagogical material, but a static coverage of modern life in the visual mode does not necessarily encourage the kind of interactivity and interplay that would come, for example, by engaging the language learning with authentic communication in real life.

Nevertheless, this is not to nullify the visual elements in CT1, even when they are not essential for completing the accompanying task. A picture can indeed contextualize a text, which enhances the comprehension of the task and/or makes the text more meaningful (Chapelle, 2016). The assistance of visual information may reduce the anxiety of learners when facing a text in a new language which has a script as difficult as Chinese.

Furthermore, analysis of the indexical relations between the visual and textual resources indicates that most instances are related through label or deictic index in both textbooks. This means there is usually a relatively straightforward connection allowing the written text to denote the accompanying picture, or vice versa. Taking a closer look at the labeling or deictic instances in CT2, most of them engage the reader's voice in order to make sense of the word and image through the indexical relationship. CT1 tends to employ the voice of the editor or the character to make sense of the coexistence of two semiotic modes, whereas the reader's voice seems to be absent in relation to associating text with technological image in the language learning.

Language learners are indeed likely to respond to the intermodal semiotics prescribed by the textbook, regardless of whether it is based on the indexical relations or whether their

voice is involved. However, it is still common that the interactions of a language classroom can deviate from the tasks and activities set beforehand, especially through teachers' guidance (Weninger, 2021). The multimodal analysis here makes users of CFL textbooks aware of technological representations and raises questions regarding the interactive and pedagogic meaning of different semiotics. It hopes to encourage users of textbooks, such as language instructors, to expand exercises and invite learners to engage with intermodal semiotics.

Take Figure 2 as an example. There could be a discussion about what could be recorded in the computer, or how realistically this image represents a doctor's office in modern China. The former instance tends to focus on the language learning aspect, whereas the latter puts the spotlight on the ideological meaning. In other words, this study not only analyzes authenticity of form – namely, what technology is represented authentically in the textbook, and how – but also the way in which users are prompted to explore authenticity of context and the purpose of the activity and task.

On the other hand, examples of CT2 (e.g., Figure 6) seem to offer authenticity of context and purpose, one being a person's reply via instant message or online chat, and the other being writing a blog post. Due to the use of both pinyin and characters, their technological appearances violate orthographic authenticity. Besides, the overall appearance of the digital platform is a bit outdated. There is also the question of whether blogging is still popular among the young generation, especially with the dominance of micro-blogging on Facebook and Twitter (Kosalge, Crampton, & Kumar, 2019) or short videos on TikTok (Leyn, Wolf, Abeele, & Marez, 2021).

The violation of authenticity of form in Figure 6 – specifically, the inclusion of pinyin rather than characters only – actually indicates the importance of flexibility. For instance, the gap-filling exercises of an online chat about a city (see the example on the left in Figure 6) can easily be adapted into writing a blog about a city which CFL learners live in or are familiar with, like the exercise on the right in Figure 6. Alternatively, teachers can ask learners to post their writing online, and then invite them to comment on each other's texts to practice their reading comprehension and writing, as well as to encourage peer learning. In other words, even though authenticity of form in Figure 6 is not perfectly attained, the explicit application of digital technology for an authentic purpose can prompt language use on an up-to-date digital platform.

Kubler (2020, p. 326) suggests that CFL textbooks need to “strive for maximum flexibility of use and leave options open for learner and instructor whenever possible”. A

successful material adaptation thus largely depends on the level of flexibility of the material. As outlined earlier, flexibility in this study is discussed from two aspects: a) while textbooks are unlikely to be frequently updated to keep pace with technological upgrades, up-to-date technological representations would best allow material adaptations to encourage authentic communication; b) handwriting is still generally necessary at the beginner level, while typing with input software could be supported if learners and teachers would like to have the option.

As seen in the examples in Figures 4 and 5, the technological representations in CT1 seem to be general and ambiguous enough to not become quickly outdated, and they are broadly authentic in appearance. On the other hand, instances in CT2 may need some updates as technology is upgraded.

However, this study goes beyond the question of what is represented and how. It examines the interactional meaning-making of verbal and visual representations, in order to understand the possible impacts on the users – both learners and teachers – of the CFL textbooks. Based on the analysis of the interactivity of meaning-making, CT2 may provide more cues for material adaptations while involving modern technology for authentic communication.

Indeed, CT1 might also be adapted, as discussed earlier in the examples for Figure 2. However, in comparison it offers fewer cues for technologically involved tasks, and therefore such adaptation would entail more effort. Specific to the examples given earlier, a teacher would first need to be made aware of the shortage of an indexical relation, as well as the lack of authenticity of context and purpose, through a multimodal analysis of interactivity of meaning-making. If the teacher wished to take a step further by guiding learners to discuss what a doctor could record in the computer, supplementary materials, such as a sample screenshot of an electronic health record, would be needed. Even if both authentic appearance (e.g., a sample electronic health record) and authentic purpose (e.g., a doctor recording a patient's symptoms) were supplied in addition to the existing information, there is still doubt as to whether and to what extent CFL learners would engage in such activity in real life. In a comparable sense, technological representations in CT2 are likely to afford more flexibility than those in CT1, in terms of material adaptations which would engage learners with authentic communication.

Furthermore, CT1 employs pinyin – a Romanized form of pronunciation of Chinese characters – for everything only up to Lesson 3. The ensuing chapters use pinyin for the main texts, with all the follow-up exercises after each main text in Chinese characters only. That is

to say, CT1 intends to draw learners' attention to characters, the actual script of the Chinese language.

For CFL learners accustomed to Roman-driven alphabets, the use of pinyin offers great assistance in the study of the language (Cao et al., 2013; Guan et al., 2011). There have indeed been attempts to deal with the challenges of unbalanced development in character pronunciation versus character composition among English-speaking learners (Everson, 1998; Zhang & Reilly, 2015). The former can be acquired faster than the latter, due to the assistance of pinyin. CT2 relies heavily on pinyin to present Chinese language to CFL learners, since it uses pinyin throughout the entire book for both the main texts and the follow-up exercises. The low proficiency level already restricts the choice of pedagogical materials (Noda, 2003b). However, with extensive use of pinyin, CT2 offers a wider choice of vocabulary to beginner learners, compared to CT1, for the variety of activities and tasks. For example, the word 'email' is introduced to learners in CT2, as shown on the right of Figure 3, but is not included in CT1.

Interestingly, pinyin input is one of the two most common input methods when typing Chinese on electronic devices (Zhang & Min, 2019). Indeed, pinyin input may not necessarily help with the learning of character pronunciation, especially since tones – a vital element of Chinese listening and speaking – are not needed when typing (Q. Zhang & Min, 2019). However, knowledge of pinyin of Chinese characters is essential in order to master pinyin typing skills.

The discussion earlier shows that its technological instances in CT 2 seem to be more flexible for adaption to technologically involved practices. Therefore, options are indeed open for CT2 learners who would like to emphasize pinyin learning, and consequently pinyin typing, when completing these practices on a digital platform. However, whether this affects language learning in the long term remains in question, especially in terms of the acquisition of Chinese characters. As Noda (2003b) points out, orthography is the core of pedagogical materials when it is significantly different from the native language of learners. However, this is beyond the scope of this study, and future research can examine how the learning of characters is set up in the textbook.

7. Conclusion

Using an integrated coding framework of index and voice, this study investigates both intermodal relations and interactive meaning-making in two CFL textbooks.

With a focus on the digital and interactive technology commonly seen in daily life, both textbooks show attempts to capture the up-to-date technology of modern life. CT2 appears to involve CFL learners' dynamic engagement to interpret the visual and textual indexical relations. In contrast, CT1 contains only a few technology-related images, with no indexical relation to the text in close proximity.

While each textbook has limitations in terms of either authenticity of form or authenticity of context and purpose, CT2 seems to be more flexible in terms of the ability to be adapted into technologically involved tasks and activities. Although the extensive use of pinyin in CT2 may contribute to pinyin typing, CT1 seems to be in line with previous literature by putting the focus on the study of Chinese characters for beginners. Besides, the flexibility of CFL textbooks also allows various adaptations going beyond technologically involved practices. Greater flexibility might entail shifting between the voices of editor, book character and reader, as well as changing indexical relations between image and text, for the purpose of facilitating learners' diversity and achieving the varying learning objectives. It is therefore vital that CFL textbook design maintain as much flexibility as possible.

It is important for users to be aware of the different emphases of these two textbooks, for the purpose of effective adaptations in CFL teaching and learning. Indeed, the mere existence of a multimodal resource does not necessarily contribute to the engagement of technology. Modern life might be better engaged in language learning when the technological instances are jointly constructed in semiotics and entail interactive interpretations.

The qualitative nature of this study limits the examination to two textbooks. However, given the volume of each textbook's content, it entails an in-depth investigation using a multimodal discourse analysis. It is also one of the first to integrate the typology of index and the notion of voice as the analytical framework in multimodal research, allowing it to focus not only on the multimodal representations, but also the intermodal relations and interactivity in multimodal semiotics. The examination of two textbooks sheds light on possible approaches to future research on CFL textbook analysis, which can contribute to a greater understanding of textbook design and a better application of pedagogical resources.

Notes

¹ The Global Chinese Teaching Materials E-Library is a corpus funded by Hanban and developed by Sun Yat-Sen University in China. It includes more than 16,000 CFL books.

² The four types can be identified from the title of Li and Gong's paper (2015): the general, regional, first-language-type and country-type of textbooks.

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以两本中文作为外语的课本作为研究对象，以课本里面的图像和文字所表现的现代技术为研究目标，本文详细阐述了文本和视觉符号的多模式联运关系及互动意义构建，展示了真实交流是如何参与到语言学习中的。研究表明，两本课本都试图捕捉现代生活里的最新科技。其中一本较多地鼓励学习者参与解读对视觉符号和文本资源之间的关联关系，而在另一课本中，更多的是彼此无关联且不太可能被交互解释的文本和图像。这些结果体现了多模式研究方式对教科书的重要性，而且本文的研究验证了这种多模式研究方式能对课本的不同侧重点提供深度解析，并能有效地应用于教学和学习中。

关键词：课本，多模态，科技，中文作为外语

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