Chinese Classifiers and their Acquisition by Heritage Language Children: a review of empirical research

Clasificadores Chinos y su Adquisición Infantil por Hablantes de Lengua de Herencia: una revisión de investigaciones empíricas

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Resumen: Este artículo presenta de manera sistemática los resultados en el campo de las investigaciones empíricas sobre el chino como lengua de herencia (CLH). El objetivo es proporcionar una panorámica sobre la adquisición y el uso de los clasificadores por parte de la niñez de CLH en contextos bilingües o multilingües. A partir de un análisis de investigaciones relacionadas con los clasificadores, en este artículo se identifican las características demográficas, la distribución geográfica, las técnicas empleadas, los enfoques, las variables y los resultados en distintos aspectos gramaticales. También se destacan las limitaciones y las áreas que merecen una mayor atención por parte de los investigadores en el futuro.

Abstract: This article systematically presents findings in the field of empirical research on Chinese as a heritage language (CLH). The aim is to provide an overview of CLH children's acquisition and use of classifiers in bilingual or multilingual contexts. Based on a review of classifier-related research, this article identifies demographic characteristics, geographical distribution, techniques employed, approaches, variables, and outcomes in different grammatical domains. It also highlights limitations and areas for further research attention in the future.

Introduction

Heritage languages (HL), often referred to as "minority languages," have been part of society since the earliest instances of linguistic contact through migration. These languages, spoken by minority groups, typically have lower prestige and official status. They are used in limited settings, such as immigrant communities. In contrast, majority languages are spoken by dominant ethnic groups (Benmamoun et al. 2013) and often receive governmental support and regulation.

Heritage language speakers (HLS) can be of any age, from children to the elderly. Valdés (2000) defines HLS as individuals who, in contexts where the home language and the majority language differ, have developed varying degrees of bilingualism while maintaining a connection to their culture of origin (Van Deusen-School 2003). In other words, HLS are bilinguals, including both simultaneous and sequential bilinguals (Monstrul 2010; Scontraz et al. 2015). Simultaneous bilinguals are exposed to two languages from birth or an early age, while sequential bilinguals may have lived in an HL environment during early childhood before moving to a society where the majority language differs from their HL. Over time, the majority language may become their dominant language (Scontras et al. 2015). Despite differences in the linguistic experiences of simultaneous and sequential bilinguals, Montrul (2010) argues HLS as they share the fundamental characteristics of this population: (i) they are bilinguals and (ii) they use the HL in a society where another language predominates.

Heritage language speakers provide a unique perspective for exploring language acquisition, maintenance, and development within the linguistic domain. This is because the language acquisition of HLS differs from that of native speakers and foreign language learners, resulting in specific grammatical peculiarities in HL grammar (Benmamoun et al. 2013). Additionally, Benmamoun et al. and Yip and Matthews indicate that vulnerable domains have been identified in the grammatical system of HLS.

The concept of "vulnerable domains" was proposed by Müller and refers to grammatical phenomena that tend to be acquired late and

undesirably due to cross-linguistic influences in the process of language acquisition and use by HLS (Yip & Matthews 2010). The appearance of vulnerable domains varies according to the HLS population (Scontras et al. 2015). Studying HL acquisition through acquisition data helps identify these grammatical vulnerabilities, which in turn is of interest for better understanding HL acquisition.

In recent years, there has been a significant increase in research on HL, including Chinese as a heritage language (CHL). Although Chinese immigrants are dispersed worldwide, most studies on CHL have focused on the United States, where Chinese comes into contact with English. These studies have primarily addressed sociolinguistic and pedagogical issues, as well as morphosyntactic, semantic, and pragmatic aspects in the field of CHL acquisition.

The primary objective of this article is to provide a comprehensive overview of studies on the acquisition and use of classifiers in Chinese as a heritage language by children. This article is organized as follows: The Background section introduces key terms, followed by a section outlining the criteria for classifying previous relevant publications. The Results section presents findings on the use of classifiers by Chinese heritage language children. The next section summarizes the key factors influencing classifier production and comprehension. Finally, the Conclusion section presents the study's findings.

Background

Chinese as a Heritage Language

Within the context of heritage languages (HL), Chinese heritage language (CHL) speakers are defined as individuals from Chinese immigrant families who use Chinese to varying extents (Zhang 2019). Additionally, these individuals maintain a cultural and ethnic connection to Chinese due to their immigration and migration experiences worldwide (He 2008).

In general, seven major Chinese linguistic groups are recognized, primarily distinguished by their phonological features: Mandarin, Wu, Xiang, Gan, Hakka, Min, and Yue. Mandarin, which is the northern dialect of China and also the standard language, as well as the Yue dialect (known as Cantonese), are the primary dialects discussed in this article. We collectively refer to them as "Chinese" in this article.

Classifiers: a Vulnerable Linguistic Domain

From a typological perspective, Chinese is a classifier language, meaning it uses a lexical category called "classifier" (Allan 1977). Classifiers are used to quantify or categorize a noun and are placed between a numeral (Num) or a demonstrative (Dem) and the noun (N), functioning as morphemes (Li y Thompson 1989). For example, to express "an apple," the structure Num-CL-N (1a) is used, saying "yi /ge4/ pingguo." This structure can also be Dem-(Num)-CL-N (1b) when a specific reference is needed.

(1a)	一	个	苹果
	yi	*/ge4/*	*pingguo*
	one	CL	apple
		'an apple'	

(1b)	这	个	苹果
	zhe	*/ge4/*	*pingguo*
	this	CL	apple
		'this apple'	

As mentioned in the previous section, there are vulnerabilities in the grammar of heritage languages, and one of the aspects vulnerable in CHL is the classifier system (Yip & Matthews, 2010; Benmamoun et al. 2013). For instance, although Chinese lacks morphological inflections, the use of classifiers is essential in the noun phrase when combined with a Num or a Dem. However, many CHL speakers tend to omit the obligatory use of the classifier. In other cases, they use two classifiers in one

phrase. Additionally, at the semantic level, there needs to be a semantic agreement between the classifier and the noun, but incorrect combinations of classifiers and nouns are frequently observed.

Chinese Classifier System

Chinese classifiers are numerous and form a complex categorization system, as different nouns require specific classifiers. This combination is not random but subject to semantic constraints. The use of a classifier is only allowed when it accurately reflects the features of the noun. Otherwise, it is considered incorrect. The combination restrictions are based on the semantic information carried by both classifiers and nouns.

Figure 1

Some main subtypes of classifiers (CL) and examples
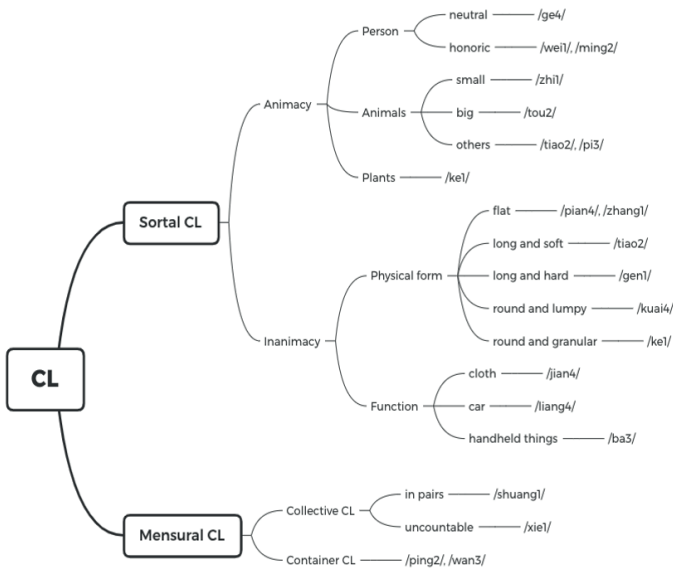
Source: own elaboration

Since most classifiers derive from nouns or verbs, they carry semantic information. Previous research has categorized classifiers based on their semantic information. As shown in Figure 1, there are nominal and verbal classifiers. In this study, we focus exclusively on nominal classifiers, hence the term "classifier" refers to this type. Nominal classifiers are divided into two main categories: sortal classifiers and mensural classifiers. Sortal classifiers are those that combine with countable objects or individuals, denoting the inherent characteristics of the referents. These can be further subdivided into classifiers of animacy, shape, and function. On the other hand, mensural classifiers refer to sets of objects, whether countable or uncountable.

Criteria for Classifying Publications on the Acquisition of Chinese Classifiers by Heritage Language Children

In this section, we identify all publications related to the acquisition and development of classifiers by bilingual or multilingual children learning Chinese as a heritage language. Our search was based on the following criteria:

- The reviewed studies had to be empirical, using research methods that generated knowledge from the observation and measurement of real phenomena.

- The studies had to focus on the acquisition and development of classifiers by children learning Chinese (whether Mandarin or other Chinese variants, such as Cantonese) as a HL in bilingual or multilingual contexts outside of mainland China.

Criterion: Geographic Distribution and Demographic Characteristics of Participants

From a geographical perspective, most studies were conducted in the United States and Southeast Asian countries, with some in Australia

and European countries. Figure 2 shows the regional distribution of the 21 publications. It is noteworthy that most of these studies focused on English-speaking societies, where English is the dominant and majority language.

Figure 2

Geographic distribution of previous studies on the acquisition of Children's Chinese CL use in bilingual and multilingual context

Source: own elaboration

We further analyzed these 21 studies based on the demographic characteristics of the participants. Table 1 highlights differences between the studies (age of the examined population, languages, sample size).

Table 1

Populations studied in previous research

Studies	Authors and publication year	Age range	Sample size	Languages
E1	Fang (1985)	4-7	30	Mandarin-English
E2	Hu (1993)	3-5	24	Mandarin-English
E3	Chen & Lei (2013)	9	30	Mandarin-English
E4	Du (2014)	4-7	55	Mandarin-English
E5	Jia & Paradis (2015)	6-10	38	Mandarin-English
E6	Kan (2019)	3-11	70	Cantonees-English
E7	Denning & Leung (2012)	unknown	126	Cantonees-English
E8	Denning et al. (2011)	5-7	25	Cantonees-English
E9	Li & Lee (2001)	5-16	34	Cantonees-English
E10	Gao (2010)	5-12	30	Mandarin-Swedish
E11	Qi & Wu (2015)			Mandarin-English
E12	Yang et al., (2022)	3-6	25	Mandarin-English

Studies	Authors and publication year	Age range	Sample size	Languages
E13	Zhang (2020b)	4-6	192	Mandarin-Dialect-English-Malay
E14	Yeoh (2019)	13-15	23	Mandarín-Dialect-Malay
E15	Gao (2015)	7-12	28	Mandarin-English
E16	Yin et al. (2018)	7-14	228	Mandarin-English
E17	Li (2020)	unknown	30	Mandarin-Dialect-Indonesian
E18	Guo (2019)	unknown	72	Mandarin-Cambodian
E19	Zhang (2020a)	unknown	138	Mandarin-Cambodian
E20	(Tao & Lucas, 2012)	3-9	80	Mandarin-English
E21	Zhang (2010)	13-16	131	Mandarin-Dialect-English-Taglog-Bisayas[1]

Source: own elaboration

Most of the 21 studies focused on children learning Chinese as a HL in bilingual or multilingual contexts. The age of the research subjects ranged from 3 to 16 years old, as it is known that bilingual children acquire classifiers with delays and in different ways compared to their monolingual peers (Li & Lee 2001).

1   Taglog and Bisayas are the native languages of the Philippines.

Regarding the linguistic profiles of the subjects, most were Mandarin-English, Cantonese-English, or Mandarin-other language bilingual children (Gao 2010; Guo 2019; Zhang 2020a). Some studies targeted trilingual children (Yeoh 2019; Li, 2020) or multilingual children (Zhang 2010; Zhang 2020b). These children in diverse linguistic envir onments showed both similarities and differences in classifier acquisition.The inclusion and exclusion criteria for subjects were relatively consistent. Generally, children with normal language development, without hearing, speech, or cognitive problems were selected. Additionally, at least one parent had to be a native Chinese speaker. Previous studies typically had small sample sizes, with a few exceptions of relatively larger samples (Zhang 2010; Zhang 2020a; Yin et al. 2018; Zhang 2020b). No distinction was made between simultaneous and sequential bilingual children in these 21 studies, despite highlighting the importance of exposure to the HL. However, two studies (Jia & Paradis 2015; Denning et al. 2014) grouped participants according to the school program they attended. Both studies were conducted in the North America, where participants attended programs using only English as the medium of instruction or programs using both English and Mandarin as the mediums of instruction.

Methods Employed in Previous Publications

Various techniques were observed for collecting data on classifiers. Table 2 presents a summary of the methods employed in these studies.

Table 2

Methodological review of children's acquisition and use of CL in bilingual and multilingual contexts

Methods	Production	Description task	Fang (1985), Hu (1993); Wang (2008); Gao (2010); Gao (2015); Qi & Wu (2015)
		Narration	Li & Lee (2001); Chen & Lei (2012); Jia & Paradis (2015); Rezzonico et al. (2016); Tao (2018)
		Retell story	Yang et al. (2020)
		Conversation	Li & Lee (2001), Zhang (2020b)
		Fill classifier in the blanks (wirtten)	Yeoh (2019); Guo (2019); Li (2020); Zhang (2020a)
		Longitudinal observation of spontaneous discourse	Wu et al. (2008)
	Comprehension	Selection of CL or images task	Hu (1993) ; Zhang (2010) ; Du (2014); Kan (2019); Li (2020)
		Judgement task	Li (2020)
	Questionnaire	Linguistic exeprience	Hu (1993); Gao (2015); Qi & Wu (2015); Jia & Paradis (2015); Kan (2019)

Source: own elaboration

Oral methods were used to collect productive data, such as description task, narration, story retelling, structured conversations, and spontaneous speech. Written methods were also employed where participants had to fill in a blank with the appropriate classifier, which required a high level of literacy and is therefore unsuitable for most young bilingual or multilingual children.

Among experimental methods, the picture or object description task was the most commonly used. For example, Hu (1993) designed objects in three different conditions to stimulate classifier production by children aged 3 to 5 years. Other methods included spontaneous speech and structured conversations, allowing the observation of classifier use without specific prompts. This longitudinal method, while useful for observing classifier development over time, required more effort in transcription and coding.

Gao (2015) created 30 images with everyday objects, corresponding to 27 sortal classifiers and 3 mensural classifiers. Gao explicitly asked children to describe the objects in the images using the Num-CL-N structure. As a supplement, after the children completed all the tests, Gao (2015) asked them the reasons behind incorrect combinations of classifiers and nouns.

Additionally, spontaneous speech and structured conversations are important methods for obtaining analysis data. Compared to description tasks, these methods allow observing children's use of classifiers (CL) and classifier phrases without any prompt. Over time, the emergence of CL in children's production can be observed. However, the disadvantage of longitudinal observation is that they are time-consuming. Beyond that, it is difficult to control CL production, and the transcription and coding work is burdensome.

Li & Lee (2001) used the narrative method to obtain data and investigate the morphosyntactic characteristics of the acquisition of CL and use by Cantonese-English bilingual children (5-16 years). They used the wordless picture book "Frog, where are you?" This book features characters, various animals, and objects that must be combined with various categories of sortal and mensural CL. Thus, it ensures a certain extent of CL production. During

the experiment, the researchers did not give specific instructions about CL to the participants, except to encourage the children to continue their narration. In this way, CL production was spontaneous. Since many objects and characters appear several times in the book, it proves to be an ideal material for investigating the syntactic-pragmatic use of CL in recent years.

A gap was identified between the production and comprehension of classifiers, as most studies focused on production. However, only four studies examined both the production and comprehension of classifiers (Hu 1993; Zhang 2010; Li 2020; Zhang 2020a). Besides tasks, most studies used a questionnaire to collect relevant sociolinguistic information as complementary.

In empirical experiments, researchers had direct control over CL (frequency and types) and manipulated variables to discover causal relationships. Several studies used multimethod designs combining production and comprehension tasks with questionnaires recording linguistic experiences and Chinese exposure, allowing a comprehensive analysis of children's classifier acquisition from both linguistic and extralinguistic perspectives.

Results

Previous studies on the acquisition of classifiers by LH children who speak Chinese have focused on morphosyntactic and semantic aspects. In this section, we will summarize the linguistic phenomena based on the data and findings from empirical publications.

Overuse of /ge4/

There is general consensus among researchers that the general classifier /ge4/ is the first to be acquired by bilingual (Mandarin-English) children (Hu 1993; Li & Lee 2001; Chang-Smith 2010). Thus, the overuse of /ge4/ has been observed from an early

age, even as early as three years old (Hu 1993). In the early stages of acquisition, children tend to use /ge4/ excessively, as evidenced by a task in which they were asked about the quantity of displayed objects (Hu 1993). In this context, more than 70% of the classifiers used by three-year-olds were /ge4/. This phenomenon persists throughout childhood, regardless of the type of experimental task, and while it decreases, it does not do so uniformly with age (Hu 1993; Li & Lee 2001). For example, according to Hu's (1993) data, the proportion of /ge4/ overuse among five-year-olds was higher than that of four-year-olds. The same occurred in Gao's (2008) study with nine- and twelve-year-old children.

Nevertheless, the overuse of /ge4/ is observed from the beginning of its acquisition, replacing specific classifiers. This pattern has been observed both in bilingual (Mandarin-English) children and multilingual children in Malaysia who learn Mandarin as a heritage language (Zhang 2020b). The classifiers replaced by /ge4/ are summarized in Table 3, based on data from Hu (1993) and Zhang (2002b).

Table 3

Objects, CL expected and used by bilingual and multilingual children according to Hu (1993) Zhang (2020b)

Objects	Expected CL	Category and subcategory of CL		CL used
owl	/zhi1/	Animacy	Sortal CL	/ge4/
bear	/tou2/			/ge4/
river	/tiao2/	Physic forms		/ge4/
paper	/zhang1/			/ge4/
wood	/kuai4/			/ge4/
tooth	/ke1/ 颗[2]			/ge4/
flower	/duo3/			/ge4/
tree	/ke1/ 棵	Plants		/ge4/
car	/liang4/	Function		/ge4/
plane	/jia4/			/ge4/
umbrella	/ba3/			/ge4/
television	/tai2/			/ge4/
clothes	/jian4/			/ge4/
A glass of water	/bei1/	Container	Mensural CL	/ge4/
A paire of gloves	/shuang1/	Collective		/ge4/

Source: own elaboration base on Hu (1993) and Zhang (2020b)

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2   The CL para 'tooth' and 'flower' have the same pronunciation but different characters. To avoid confusion, Chinese character are exposed here.

Faced with the frequent and overuse of /ge4/ instead of other specific classifiers, Hu (1993) suggested that, from the perspective of bilingual childhood, /ge4/ was a classifier that could be combined with all nouns. It was used strategically when children did not remember or were unsure about specific classifiers for referents. Hu (1993) found evidence for this hypothesis in an experiment with imaginary objects. Hu (1993) designed the imaginary objects based on the semantic information carried by the examined classifiers. As shown in (2), although the object was unknown to the children, they even created a name "burenshi" for the referent, following the syntactic grammar of classifier phrases. However, regarding the classifier, it was expected that if the children had acquired the classifiers, they could provide specific classifiers according to the perceived characteristics of the objects, even if they did not know the names of the referents. Consequently, classifiers were observed in their responses to the imaginary objects, but the classifier was only /ge4/.

(2) 一　　个　　不认识
      yi　*/ge4/*　*burenshi*
      one　CL　unknown
          'an unknown

With age, the overuse of /ge4/ decreases as children acquire specific classifiers (Hu 1993). Bilingual (Mandarin-English) children at the age of three tend to use exclusively the general classifier /ge4/, but from the age of four, this pattern changes. Up to the age of six, all children employ at least two types of classifiers instead of using only /ge4/ (Fang 1985). In the case of bilingual (Cantonese-English) children, they stop using exclusively /ge4/ from the age of five (Li y Lee 2001).

The Acquisition Order of Classifiers

Although it is known that the acquisition of classifiers by bilingual and multilingual children begins with the general classifier /ge4/, there are few studies investigating the exact sequence of classifier acquisition. Hu (1993) inferred a possible order of acquisition in production based on the frequencies and order of appearance of classifiers, starting with /ge4/ and continuing with animacy, shape, and function classifiers. However, this order is approximate, as several classifiers are not acquired linearly but rather alternately with other types of classifiers. According to Hu (1993), the order of classifier acquisition for bilingual children learning Mandarin as a HL would be: general classifier (/ge4/), animacy classifier, shape classifier, and function classifier.

In summary, previous studies on production and comprehension indicate that bilingual children have the ability to classify objects according to their physical characteristics and, therefore, can select or create appropriate classifiers (from their point of view) for nouns. However, their categorization and comprehension abilities appear to be better than their production abilities concerning classifiers.

Ungrammatical Classifier Phrases

In bilingual or multilingual contexts, children often use classifier phrases flexibly once they become aware of classifiers (Chang-Smith 2020). This leads to the emergence of ungrammatical classifier phrases, such as omission and redundancy of classifiers, as well as disorder in classifier phrases. These morphosyntactic errors (Benmamoun et al., 2013) are a consequence of the morphological vulnerability in HLS. The errors vary according to methods, the location of heritage language speakers, and their age (Matthews & Yip 2014).

Among morphosyntactic errors, omission is one of the most reported errors. Omission can occur in children's productions regardless of the type of task. As shown in (3a), the classifier is omitted when quantifying the referent. The correct form of the classifier phrase should be 'one - /liang4/-car' (3b).

(3a) *   一   车

           yi   che

          one   car

              'a car'

(3b)   一   辆   车

           yi   /liang4/   che

             'a car'

For example, in a narrative task, classifier omission was found in bilingual (Cantonese-English) children aged five and eight years (Li y Lee 2001). In a picture description task, even eleven-year-old (Jia & Paradis 2015) bilingual (Cantonese-English) children still omitted the classifier (Kan 2019). Moreover, omissions were not limited to verbal productions but were also observed in written responses, as reported in a written test conducted in Cambodia with Chinese heritage language students aged eight to eleven years (Zhang 2020a).

Bilingual and multilingual children tend to use two classifiers in a phrase (4a) or add a classifier where it is not necessary, which has been defined as classifier redundancy. This has been observed in bilingual (Cantonese English) children aged five, eight, eleven, fifteen, and sixteen years (Li & Lee 2001; Kan 2019). This error was also found in bilinguals learning Mandarin as a HL, aged eight to eleven years (Zhang 2020a). It is notable that the redundancy of /ge4/ is common in these cases, as children tend to consider Num-/ge4/ as an inseparable unit, sometimes as a strategy when they are unsure which classifier to use. However, there are special cases where a lexical item that appears to be a noun (N) is a mensural classifier (4b), justifying the omission of another classifier between the numeral and the N.

(4a)　*　三　　个　　　　张　　　　床
　　　　　san　　/ge4/　　/zhang1/　　chuang
　　　　　three　CL　　　CL　　　　bed
　　　　　　　　　three beds'

三　　张　　　　床
san　/zhang1/　chuang
three　CL　　　bed
　　three beds'

(4b)　*　一　　个　　　年
　　　　　yi　　/ge4/　　nian
　　　　　one　CL　　　year
　　　　　　　one year'

一　　年
yi　　nian
　　　'

Curiously, almost all reported cases like (4a) indicate that the redundant classifier is /ge4/. This classifier appears after the numeral, and the second classifier, which is the correct and expected one, follows /ge4/. It seems that children consider Num-/ge4/ as an inseparable unit, with /ge4/ being an adhesive element of Num. In another case (4b), the redundancy of /ge4/ appears more as a strategy because bilingual children knew that a classifier should be inserted between Num and N, but they were confused about which classifier to use. As a result, they used /ge4/. However, there are some special classifier phrases where a lexical item seems to be a noun but is actually a mensural classifier. The element "nian2" in (4b) means "year," which is a mensural classifier, while also being a noun. When used to express time, it functions as a mensural classifier. Hence, there is no need for another classifier between "one" and "nian."

Apart from the two typical errors, Zhang (2020a) found another common error in the use of classifiers by Mandarin-Cambodian speaking

children: the disorder (5) in the sequence of classifier phrase. According to Mandarin, the correct order of classifier phrase is Num-CL-N, but many cases observed by Zhang (2020a) showed an N-Num-CL sequence. This was due to the influence of Cambodian, which has a different classifier phrase order from Mandarin. To verify this, Zhang (2020a) modified the order of the classifier phrases in Mandarin and asked the participants to rearrange them, and many followed the Cambodian order. Consequently, Zhang (2020a) argued that the disorder in Mandarin classifier phrase is due to the influence of Cambodian.

(5)　　*　金鱼　　五　　　条
　　　　　　　Jinyu　　wu　　/tiao2/
　　　　　　　fish　　five　　CL
　　　　　　　'five fish'

　　　　　　　五　　　条　　　金鱼
　　　　　　　wu　　/tiao2/　jinyu
　　　　　　　five　　CL　　　fish
　　　　　　　'five fish'

Code Mixing in Classifier Phrases

Code-mixing, which involves switching between two or more languages or dialects, is a common phenomenon in bilingual or multilingual contexts. This phenomenon can manifest itself in two main ways: the insertion of lexical items from the dominant language into an SCL or the use of a noun phrase in the dominant language instead of an SCL.

(6a)   那   个   *Orange*

      na   */ge4/*   *orange*

      that   CL   orange

          'that orange'

In example (6a), the English word "orange" is combined with a coherent prosody and fluent syntax in the Dem-CL-N phrase. This phrase still follows the syntactic grammar of Mandarin, with only the noun in English. This type of mixing is common among Mandarin-English bilingual children (Hu, 1993), Cantonese-English bilingual children (Li & Lee 2001, Kan 2019), and multilingual children (Zhang 2020b). Due to the mixing of a single element, it is also known as morphosyntactic code mixing (Bartlett & González-Vilbazo 2010; He 2013). This mixing is attributed to the lexical scarcity of the HL. Due to the lack of lexical knowledge, children cannot recall the word in time, so they use the lexical item from the dominant language occupying the noun position. Meanwhile, Wei (2005) and Bartlett & González-Vilbazo (2010) assert that morphosyntactic code mixing indicates the existence and acquisition of the syntactic grammar of the HL.

(6b)   keoi5   *give*   ngo5   a   *surprise*

      he   give   me   a   surprise

        ´they want to give me a surprise. ´

          Example from (Li y Lee 2001)

In example (6b), another instance of code-mixing is demonstrated. The use of Num-CL-N is typically required to express 'a surprise' in Cantonese; however, in this instance, 'a surprise' is used to avoid employing SCL. This strategy is considered negative as it circumvents the use of both CL and SCL (Li & Lee 2001)

Code-mixing is a natural outcome of bilingualism or multilingualism, with its prevalence and the languages involved depending on the lexical and grammatical development of children (Wei 2005; Poeste, Müller & Gil 2019). Regardless of whether they are bilingual or multilingual, the integration of lexical items from a dominant language into the heritage language (LH) productions is associated with proficiency and lexical development within that linguistic system.

Major Factors Affecting the Acquisition of Classifiers by Heritage Speakers

Although the acquisition of classifiers by heritage Chinese speakers has been approached from different theoretical perspectives, the motivations behind these linguistic phenomena can be broadly divided into two categories: intra-linguistic and extra-linguistic factors. Table 4 summarizes the main factors.

Table 4

Main Factors affecting the acquisition of classifiers

Linguistic Factors	Extralinguistic Factors
Complexity of the Chinese classifiers system	Age
	Input
The semantic ambiguity of /ge4/	Language contact (with dominant language or dialect, etc.)

Source: own elaboration

The overuse of the classifier /ge4/ is primarily attributed to its semantic ambiguity. Unlike other specific classifiers with clear semantic denotations, /ge4/ is inherently ambiguous in its usage. This ambiguity complicates comprehension for children, as they struggle to extract the characteristics of nouns paired with /ge4/. Additionally,

learning the entire classifier system takes time, and some children may only have been exposed to a few classifiers in early childhood. Some may even be unaware of the system's existence. Consequently, when confronted with an opaque or unclear classifier system, children resort to using /ge4/ as a default morpheme (Myers & Tsay 2000). Moreover, the nature of the input received, both in quality and quantity, from native monolingual speakers can vary significantly and affect the efficacy of classifier production.

Furthermore, the acquisition of classifiers is complicated by the semantic complexity inherent in distinguishing between subcategories. Children's ability to identify these subcategories is related to their cognitive development. As children grow, their cognitive abilities improve, enabling them to identify non-relevant features more accurately, thereby developing a more robust understanding of the classifier system and reducing incorrect usage due to semantic misunderstanding.

Thirdly, the phenomena of ungrammatical phrases and code-mixing in classifier usage are often attributed to linguistic transfer (Zhang, 2020b) and the influences of additional languages (Li & Lee 2001; Kan 2019 Yip & Matthews 2010; Kan 2019). For instance, in Cambodian, a classifier phrase must follow the structure Num-N-CL. This leads Cambodian-Chinese speakers in studies to produce classifier phrases according to Cambodian grammatical rules. Similarly, English-Chinese speakers tend to omit classifiers since English does not require a specific classifier to quantify a noun.

Conclusion

This article has reviewed research on the acquisition and use of classifiers in children learning Chinese as a heritage language in bilingual or multilingual contexts. The review has shed light on the patterns, implications, and factors related to classifier acquisition. The findings provide a comprehensive overview of classifier acquisition among children and adolescents who speak Chinese as a heritage language across different dimensions.

Based on these previous studies, several important conclusions can be drawn. The tendency to overuse the generic classifier /ge4/ has been confirmed in children of various ages and linguistic contexts, regardless of the majority language spoken. Morphosyntactic issues are less frequent than semantic issues, although omissions, word order errors, and other ungrammatical uses related to the majority languages of heritage Chinese-speaking children are observed. However, research on the order of classifier acquisition is limited, and further exploration in this area is needed. The tendency to overuse /ge4/ instead of other specific classifiers has also been highlighted, but deeper investigation is required to understand which categories and subcategories of classifiers are more prone to being replaced by /ge4/ and why. Additionally, research has primarily focused on morphosyntactic and semantic aspects, while pragmatic knowledge related to classifier use has received less attention and could be a potential area for future study.

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