A Case Study of the Acquisition of Mandarin Classifiers*

Haiyong Liu
(Wayne State University)

Liu, Haiyong. (2008). A Case Study of the Acquisition of Mandarin Classifiers. *Language Research* 44.2, 345-360.

In this paper, I examine the acquisition data of a Mandarin-speaking child Bao-Bao (2;2.7) to study his acquisition of Mandarin classifiers, which are obligatory when a demonstrative or a numeral occurs. I argue that despite the poor input from the caregiver, the child is aware of the classifier projection and the selectional syntactic relation within a Mandarin DP from an early age, which is consistent with the Strong Continuity Hypothesis (Lust 1999). I then offer arguments with respect to processing restrictions and syntactic parameter-setting to explain why the child omits and misuses classifiers. A phonological account will also be examined.

Keywords: first language acquisition, classifier, Mandarin, the Strong Continuity Hypothesis, DP

1. Introduction

Mandarin Chinese uses classifiers (CL) to categorize nouns (N). As shown in (1), Mandarin requires a nominal classifier after numerals (Num) in order to quantify and to individualize nouns, and after demonstratives (Dem) for deictic reference, which seems to be an areal feature of East Asian languages (cf. Zhang 2007, Cheng & Sybesma 2005, Aikhenvald 2000, Yang 2001, Hu 1993, Tai 1992, Erbaugh 1986)[1]. For example, *tiao* means 'stripe' when used alone as a noun and it is also the classifier for objects that are thin and long, such as *lingdai* 'necktie', *yu* 'fish', *chuan* 'ship', and *xinwen* 'news (item)' etc. I will give a more detailed introduction to Mandarin nominal classifiers in 2:

(1) a. san tiao lu
three CL road
'three roads'

b. zhe tiao lu
this CL road
'this road'

* I would like to thank Nina Hyams, Eric Jackson, and the anonymous reviewers of *Language Research* for their insightful comments, without which, this paper can never reach this stage

[1] Mandarin also has a small number of verbal classifiers that are used to quantify verbs, which, however, will not be discussed in this paper.

In this paper, I attempt to profile the syntactic structure regarding classifiers of a Mandarin-speaking child at an age of 2;2.7. I examine the data collected from CHILDES (MacWhinney 2000) and contend that the results corroborate the Strong Continuity Hypothesis (Lust 1999; Boser, Lust, Santelmann & Whitman 1992), despite the child's frequent omission and misuse of classifiers. I then offer explanations for the data with respect to processing difficulties, the Principles-and-Parameters approach, and prosodic considerations.

In Section 2, I introduce the classifier system of Mandarin Chinese. In Section 3, I present a literature review and my hypotheses concerning children's acquisition of classifiers at an early stage. In Section 4, I introduce the data and research methodology. In Section 5, I provide the results of data analysis. In Section 6, I account for the data from the perspectives of language processing, syntax, and phonology. Section 7 is the conclusion.

2. The Classifier System in Mandarin

There are around 40 commonly used classifiers in Mandarin Erbaugh (1986), Chao (1968) and Lü (1981) lists 150 classifiers in total. Cheng and Sybesma (2005), Chien, Lust and Chiang (2003), and Tai (1992) have further categorized them into sortal classifiers (also called *count classifiers* or *classifiers*) and measure classifiers (also called *measure words*).

Different nouns require different classifiers. Some count-classifiers are extra-linguistically salient and are based on the shape, part, or function of the noun (Zhang 2007), such as *zhi* 'twig' for pens, *tou* 'head' for cattle, *ba* 'handle' for knives etc. Other count-classifiers are arbitrarily determined, such as *pi* for horses and *liang* for automobiles. Measure classifiers indicate the mensural unit of the noun, such as *xiang* 'box' and *bang* 'pound' etc. These two subtypes of classifiers differ from one another when it comes to denoting definiteness and indefiniteness (Cheng & Sybesma 2005).

As shown by (2) and (3), classifiers are obligatory when a common noun like *ren* 'person' is modified by a demonstrative like *zhe* 'this' or a numeral like *san* 'three'. Without the required classifiers, (2) and (3) are ungrammatical (Tang 2005, Yang 2001, Chao 1968).

(2) a. zhe ge ren
this CL person
'this person'

b. *zhe ren
this person
'this person'

(3) a. san ge ren
three CL person
'three people'

b. *san ren
three person
'three people'

(4) is an example showing the ordering of Dem > Num > CL > N within a DP:

(4) zhe san ge ren
this three CL person
'these three people'

Classifiers are bound morphemes that are always unstressed. Besides being lexically and semantically selected by a suitable noun, they must be syntactically selected by a demonstrative or a numeral in order to modify a noun. Only the following sequences in Table 1 are grammatical within a Mandarin DP:

(5) **Table 1.** Possible orderings within a DP in Mandarin

Sequence	Example
Dem + Num + CL + N	zhe san zhi bi this three CL pen 'these three pens'
Dem + Num + CL	zhe san zhi this three CL 'these three (twig-like things')'
Dem + CL + N	zhe zhi bi this CL pen 'this pen'
Dem + CL	zhe zhi this CL 'this one (twig-like thing)'
Num + CL + N	san zhi bi three CL pen 'three pens'
Num + CL	san zhi three CL 'three (twig-like things)'

The following sequences in Table 2 are ungrammatical due to violation of the syntactic selection requirements discussed above in examples (2), (3), and (4):

(6) **Table 2.** Impossible orderings within a DP in Mandarin

Sequence	Example
*Dem	*zhe 'this'
*Dem + N	*zhe bi this pen 'this pen'
*Dem + Num	*zhe san this three 'these three'
*Num + N	*san bi three pen 'three pens'
*CL + N	*zhi bi CL pen

To sum up, whenever there is a demonstrative or a number, there must be something following it, either a bare classifier or a classifier followed by a noun. Furthermore, no classifier can occur without a demonstrative or a number preceding it.

Hu (1993) also notices that in archaic Chinese, or in colloquial, poetic, and idiomatic expressions, Mandarin classifiers may be omitted. For example, in adult speech, if the noun is singular, the speaker can drop the classifier after a demonstrative, especially in fast speech (Biq 2004, Chao 1936); e.g., *zhe ge ren* 'this CL person' can become *zhei ren* 'this person'. I will show in 2 that the adult caregiver in the data uses casual speech like this most of the time. Note that although the standard demonstrative is *zhe*, in structures without a classifier, it is *zhei* /dz̩eI/. The extra /I/ in the diphthong may be considered as a reduced form of the default classifier ge that is attached to the demonstrative *zhe*; *zhei* is therefore an analytical form of *zhe* + *ge* 'this CL'[2].

As in many other classifier languages, Mandarin also has a default (or general) classifier, ge (Zhang 2007, Aikhenvald 2000, Allen 1977). Besides being used with the largest number of nouns, it replaces classifiers that tend to be formal in casual speech, as in (7), and classifies nouns that are newly coined, as in (8):

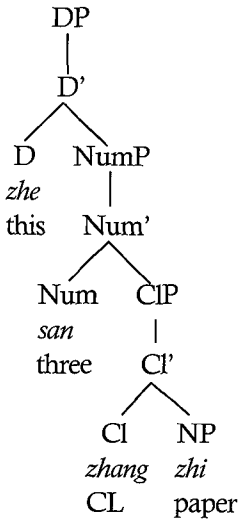
(7) zhe ge deng vs. zhe zhan deng (*zhan* is more formal)
this CL light this CL light
'this light' 'this light'

[2] Many speakers have reanalyzed *zhei* as a demonstrative and add classifiers after it.

(8) yi ge yimeir
one CL email
'an email'

The syntactic structure of Mandarin DP is proposed as in (9) (Cheng 1997, 1999; Li 1999): D° *zhe* selects a NumP as its complement, which can be left empty if it is singular. NumP then selects a ClP with an NP as its complement.

(9) zhe san zhang zhi
this three CL paper
'these three pieces of paper'



3. Literature Review and Hypotheses

3.1. On the Acquisition of Chinese Classifiers

There has not been too much literature on the production of classifiers in child Mandarin from a generative approach. Most of the available previous works either focus on the perception of classifiers by children, such as Chen, Lust and Chiang (2003), or account for the data from a cognitive perspective, such as Hu (1993). Also, the ages of the studied children in the literature are older than 2;2, the data point to be scrutinized in this paper.

Chen, Lust and Chiang (2003) show that children between the ages of 3 and 8 can distinguish sortal and measure classifiers in comprehension. Similar dichotomy is found in Cantonese; and Cantonese-speaking children between the

ages of 3 and 5 produce both subtypes with equal competence (Tse, Li & Leung 2007). In this paper, I will focus on the acquisition of count-classifiers, since they are the only type that is attested in the data, a possible result of the child being too young to measure objects with numbers.

Hu (1993) also studies the comprehension of classifiers by Chinese children from a cognitive perspective. Judging from her experiment's results, Hu (1993) reports that there is a developmental sequence of the acquisition of various classifiers by the children and that the Chinese children fully learn classifiers by age 5. But at age 4, they know the selectional hierarchy of Num + CL + N. Their comprehension matures earlier than production, and they acquire the default classifier ge before other specific classifiers emerge. The children first associate specific classifiers with some prototypical objects, which testifies to the ontological constraint reflected in early states of language acquisition (Soja, Carey & Spelke 1991).

3.2. On the Acquisition of Classifiers in Other Languages

Development scenarios that are similar to Hu (1993)'s findings have laso been reported in child Japanese (Uchida & Imai 1999) and child Thai (Carpenter 1991) as well.

Uchida and Imai (1999), after studying Japanese acquisition data of late 4- and 5-year olds, argue that the acquisition of classifiers is much slower than that of the distinction between count nouns and mass nouns in English, despite the fact that classifiers form a closed class. The difficulty children face in learning classifiers seems to stem largely from the complex semantic nature of the classifier system: the size of the classifier set is large and the criteria for dividing the noun system with classifiers are complex and opaque (Yamamoto & Keil 2000). Hyams (2002) and Liu (2009) confirm that lexical complexity is responsible for acquisition delays; for example, the acquisitions of Greek and Mandarin moods and modals are after that of Greek and Mandarin aspects due to the abstractness and bigger size of the former.

Uchida and Imai (1999) suggest a three-phase process of classifier acquisition in general: first the child is unaware of the classifier projection; second, the child is aware of the grammatical role of the classifiers but overuses general unmarked classifiers; and third, the child starts to extract meanings for each classifier and extends classifiers to appropriate novel objects.

An interesting question to ask about Uchida and Imai (1999)'s research is what triggers the child's awareness of the classifier phrase at phase two. Or, alternatively, is it possible that they have this kind of awareness at phase one as well?

3.3. Hypotheses

In this paper, I study the acquisition data of a child younger than the subjects investigated in the literature (2;2.7) and I focus on the acquisition of the sequence of Dem + CL + N. As mentioned above, at the age of 2;2.7, the child has not learned how to count, and only three utterances in the database involve numbers. As a result, I will not include the acquisition of the sequence of Num + CL + N, which, however, has been discussed in Hu (1993) for older children. On the other hand, syntactically, Dem is a projection higher than Num (cf. (9) and Aikhenvald 2000, Cinque 1999), the access of which can give us more insight regarding classifier acquisition.

My first hypothesis is that, predicted by the Strong Continuity Hypothesis (Lust 1999; Boser, Lust, Santelmann & Whitman 1992), which asserts that children have full clause structure and functional categories very early on, the child should have acquired the syntactic projection of classifiers even at the first phase in Uchida and Imai (1999), which is contrary to their conclusion. I will examine the Chinese acquisition data with more attention paid to what the children are capable of producing and will discuss traces that reflect the existence of the classifier projection.

Bloom (1990) argues that child production data should be explained in terms of full competence coupled with processing limitation, which creates an imperfect mapping from what they intend to say and what they actually say. My second hypothesis is that, as illustrated by the developmental stages in Hu (1993), the child will not fully produce the sequence of Dem + CL + N due to processing difficulties; but still, their utterances, framed by the innate syntax structure, will not completely be wild cards.

4. Data and Methodology

For this research, I use the 83-page transcript prepared by Tardif (1993), taken from the CHILDES database (MacWhinney 2000). The child Mandarin-speaker is Bao-Bao of Beijing when he is 2;2.7 (the file *BBvis5.cha*). The situation is Bao-Bao playing with his father, watching TV, and drawing during Tardif's visit. The father is an intellectual and is the only surrounding adult caregiver; he is from Beijing as well. I code each of Bao-Bao's utterances for

the presence of a demonstrative,
the presence, absence, or misuse of a classifier,
the presence or absence of a noun, and
the transitivity of a verb.

The reason for coding the non-classifier elements is to see if they play a role in Bao-Bao's acquisition.

Although I have coded only the child's speech, I have also examined the child-directed speech of the father, which forms the majority of the linguistic input Bao-Bao is exposed to. I take notes of the number and forms of the demonstratives he uses in order to study the influence of motherese on the child's acquisition.

5. Results

5.1. Bao-Bao's Speech

The child has 181 utterances that include demonstratives, followed by numbers, classifiers, nouns, or nothing at all. The combinations are summarized in Table 3. The symbol '-' before an item indicates that the item is not present in the utterance; XCL indicates a classifier inappropriate for the noun. Dem + XCL -N is coded only when the noun is recoverable from context, so the relevant number is systematically low. Numbers in parentheses are tokens that follow a transitive verb. The boxes in shades are ungrammatical sequences in adult's grammar.

(10) **Table 3.** Dem, CL, and N Sequences Produced by Bao-Bao

		N	-N	
	CL	6	64	
Dem +	XCL	11	5	
	-CL	40 (22)	55 (37)	
Total:		57	124	181

Less than half, 38.6% of the 181 utterances involve correct use of classifiers ((Dem + CL –N (64)) + (Dem + CL + N (6)) / 181). By correct use, I mean no needed item is omitted, and all present items are semantically and lexically appropriate. Such results are far from satisfactory to say that the child has acquired the classifier system, considering the 90% accuracy rate as a sign of complete acquisition standardized by Brown (1973).

Among the 86 classifiers that are used ((Dem + CL + N (6)) + (Dem + CL –N (64)) + (Dem + XCL + N (11)) + (Dem + XCL –N (5))), 94.5% are *ge*, the default classifier. 18.5% of all the classifiers used are semantically inappropriate ((Dem + XCL –N (5)) + (Dem + XCL + N (11)) / 86). The child uses only four classifiers: *ge*, *liang* for vehicles, *zhi* for pencils, and *zhan* for lights. He never fails to use *ge* when it is appropriate; all instances of XCL are cases where the child overuses *ge*. No other misused classifier is attested.

5.2. Father's Speech

Naka (1999) also observes that younger Japanese children tend to overuse the general classifiers, while the use of specific classifiers increases over development; adult caregivers tend to match the performance level of the children, and improvement in the children's performance is accompanied by the increase of specific classifiers in motherese. In Tardif's (1993) data, the caregiver, i.e., the father, does not overuse *ge*; instead, he omits the majority, 84.6%, of the needed specific classifiers ((Dem –CL + N (6)) + (Dem –CL –N (5)) / 13). As mentioned in 2, such omission is descriptively grammatical in a certain register.[3]

Table 4 shows the statistics of the father's speech regarding the use of demonstratives and classifiers. Numbers in parentheses indicate the number of forms which occur following a transitive verb. The boxes in shades are ungrammatical.

(11) **Table 4.** Dem, CL, and N Sequences Produced by the Father

		N	-N	
Dem +	CL	1 (1)	1	
	-CL	6 (2)	5 (1)	
Total:		7(3)	6(1)	13

The father drops the needed classifiers even in his child-directed utterances, violating the prescriptive grammar rule introduced in 2. If this is the linguistic performance that the child is exposed to and attempting to imitate, then it becomes strikingly impressive that 38.6% of the classifiers used by the child are correct, actually, a better performance than his father's.

6. Discussions

6.1. Processing Considerations

In Bao-Bao's speech, the most complete sequence of a possible Mandarin DP 'Dem + Num + CL + N' is never attested. Only 9.3% of the occurring demonstratives are followed by both CL (CL or XCL, i.e., lexically correct or incorrect) and N, i.e., ((Dem + CL + N (6)) + (Dem + XCL + N (11)) / 181).

[3] I am grateful to an anonymous reviewer who points it out that the father's utterance pool is too small, with only 13 relevant tokens. Unable to find a larger dataset, I will base the input model on these 13 utterances, which I assume to be typical and representative. At any rate, the influence of adult input is a very minor point in this paper.

Note that, syntactically, Dem + (X)CL ± N is correct. 38.1% of the occurring demonstratives are followed by classifiers (CL or XCL) but not nouns, i.e., ((Dem + CL –N (64)) + (Dem + XCL –N (5)) / 181). 22.1% of the occurring demonstratives are followed by nouns but not classifiers, which is ungrammatical, i.e., ((Dem + N (40)) / 181). 30.3% of the demonstratives are followed by neither a classifier nor a noun, which is also ungrammatical, i.e., ((Dem (55)) / 181). Overall, it seems that nouns and classifiers tend not to occur together after the demonstratives in Bao-Bao's speech.

I relate such a phenomenon to Processing Restrictions (Bloom 1990): processing difficulties serve to keep the children's utterances relatively short. For example, in child English, null subjects are more frequent in sentences with transitive verbs followed by an object than in sentences with intransitive verbs not followed by an object (Roeper & Rohrbacher 1994). By the same token, a noun after the classifier may cause more processing burden to the child; as a result, the child drops either the noun or the classifier to make the utterance shorter.

Even so, we can see that the child drops N more often than CL after a Dem; in other words, there are more grammatical Dem + (X)CL than the ungrammatical *Dem + N (38.1% vs. 22.1%), which reveals that even when the child is faced with processing restrictions, he still prefers the syntactically acceptable structure.

Furthermore, as shown in Table 3, more than half, 62.1% of the dropped classifiers ((Dem –CL + N (22)) + (Dem –CL –N (37)) / (40 + 55)) happen postverbally in the object position, which further proves the processing difficulty effects caused by the length of a certain utterance.

Due to the processing restrictions, the child drops either the noun or the classifier in Dem + CL + N, with the grammatical omission of N more often than the ungrammatical omission of CL. The majority of CL-omissions happen postverbally.

6.2. Syntactic Considerations

6.2.1. Knowledge of CIP and Its Position

Very interestingly, although the child drops classifiers or nouns after demonstratives (Dem + CL or *Dem + N), he never drops demonstratives that precede the classifiers or nouns (*CL + N or *N). Of course, I cannot always determine if *N is correct or not, since bare nouns can be grammatical in Mandarin (Cheng 1999); but I never observe the *CL + N sequence. The conclusion I can reach is that the child is aware of the obligatory selectional relation between a DP and its complements. For 69.7% of the cases ((Dem + CL + N (6)) + (Dem + XCL + N (11)) + (Dem + CL –N (64)) + (Dem + XCL –N (5)) + (*Dem + N (40)) / 181), he puts either a CL or an N after the D.

The child seems to know that there is a CL projection between DP and NP and that it must be filled. This accounts for the child's syntactically well-formed utterances of Dem + CL + N, Dem + CL, *Dem + XCL + N, and *Dem + XCL, which make up 47.5% of the total tokens involving demonstratives. It is fair to conclude that, syntactically, the child knows that the underlying structure of a Mandarin DP is Dem + (Num) + CL + N. The overuse of *ge* as discussed in 4 strengthens such a finding: the child has acquired the entire DP projections but uses ge as a makeshift syntactic place holder for ClP before learning the whole array of more than 40 individual classifiers. Thus the misuse of classifiers is more of a semantic, pragmatic, or cognitive issue than an indicator of syntactic incompetence. Chien and Wexler (1988) argue that pragmatics matures after syntax in child language.

6.2.2. Why *Dem + N? A Principles–and–Parameters Explanation

I have proposed in 6.1 that processing difficulties make the child produce more of the shorter Dem + (X)CL (38.1%) and *Dem + N (22.1%) than the longer Dem + (X)CL + N (9.3%). Also, Dem + (X)CL indicates his knowledge of ClP and its proper position. Then, how do we account for the 22.1% of the ungrammatical *Dem + N, which shows no sign of the ClP? One interpretation is that the child is sacrificing the noun by raising it from its base NP position to fill the required ClP position below DP.

There are two ways to fill an empty head position, either by inserting a head or by moving another head to this position. Movements within a DP are not unusual cross-linguistically, for example, the Italian N-to-D movement of bare nouns for a proper interpretation (Longobardi 1994):

(12) a. E'venuto il vecchio Cameresi.
came the older Cameresi
'The older Cameresi came.'
b. E'venuto Cameresi vecchio.
came Cameresi older
'The older Cameresi came.'

In (12), the proper noun *Cameresi* moves from its base N° position to D°, and consequently, the determiner *il* 'the' in (12) is dropped, due to the head movement constraints.

Another movement within a DP is the N-to-CL movement in adult Mandarin when there is no demonstrative:

(13) Gou jintian tebie tinghua.
dog today very obedient
'The dog is very obedient today.'

Cheng (1999) argues that the bare noun *gou* 'dog' in (13) has moved from N° to CL° to receive a definite interpretation, since like D°, the classifier may be said to have a singularizing function: the classifier singles out singular units by picking out one instance of what is denoted by N.

Although *CL + N is not grammatical in Mandarin, it is grammatical in Cantonese, with an obligatory definite interpretation. Apparently, in (14), the classifier *zek* has moved from its base position to D° to achieve definiteness:

(14) Zek gau zungji sek juk.
CL dog like eat meat
'The dog likes to eat meat.' NOT: 'Dogs like to eat meat.'

Cheng (1999) concludes that Cantonese and Mandarin choose different devices to fill the ClP° position: Cantonese inserts a classifier shown in (14); Mandarin, however, resorts to the N-to-CL movement as shown in (13). An idiosyncrasy of Mandarin is that if the speaker does not resort to N-to-CL movement but rather to classifier-insertion, a demonstrative is required; this explains why a string like *CL + N is not possible in Mandarin.

Having examined these dialectal and cross-linguistic variations, I can now clarify why, after acquiring all the needed projections within a DP, Bao-Bao still drops so many classifiers. Within the generative grammar framework that reduces variations in linguistic principles into binary parameterizations, Hymes (1988) offers a Principles-and-Parameters approach to explain the developmental stages in a child's language acquisition. She argues that children, guided by the innate universal grammar principles, might initially set grammar parameters differently from those of the adults, more likely to the default or less marked values; and later, with the increase of their L1 input, they will reset the parameters to those of his or her native language (cf. Wexler & Manzini 1987).

Following the Parameters-and-Principles approach, I suggest that the following picture of Bao-Bao's acquisition of classifiers: he has learned that, in Mandarin, when there is a demonstrative, there must be a classifier. He can fill CL° with a classifier, most likely *ge*, from his semantically limited lexicon. By doing so, he will drop N° due to processing difficulty to surface Dem + CL. Or, the child can move N° to CL°, another way to lessen the processing burden and to avoid the lexical complexity of classifiers to surface *Dem + N. The problem is not that the child has not acquired the CL projection, but rather that he is using the parameter of N-to-CL movement under a situation where the adult speakers would insert a classifier, as selected by the demonstrative.

6.2.3. Why *Dem?

There is still another question, however, that demands a solution: why the

ungrammatical *Dem has a high occurrence rate of 30.3%, where neither N° nor CL° is filled? I attribute this to pragmatics: *Dem is caused by hesitation, when Bao-Bao does not know what the correct classifier is or how the object is named, because it is indeed meaningless for a speaker to have a D without anything after it. The father also has a high 38% of bare *Dem in his data ((Dem –CL –N (5)) / 13), which is more likely a matter of linguistic performance than linguistic competence.

6.3. Phonological Considerations

Besides processing and syntactic concerns, are there any conceivable phonological explanations for the child's performance? For instance, the presence or absence of a classifier may be out of prosodic considerations. This would be analogous to the placement of unstressed pronouns in verb-particle constructions in English: the sentence *I gave it up* is grammatical, while **I gave up it* is ill-formed, not necessarily for reasons of syntactic structuring, but possibly because the pronoun *it* cannot support stress.

A possible interpretation of the child's performance is that he is attempting to make his utterances fit a minimal word or binary foot, a preference found across languages (Duanmu 1998, 2007). Demuth (1996) discovers that the first words for children acquiring three distinct languages all have the form of a binary foot, even if the input itself is not a binary foot.

If such an assumption is true, we would expect more forms with a binary foot like 'Dem + (X)CL -N', e.g., *zhei-ge* or the ungrammatical '*Dem + N', e.g., *zhe ren* 'this person' than the ungrammatical monosyllabic '*Dem -CL -N', e.g., *zhe*. Such a tendency, however, is not very significant, according to Table 3: Dem + (X)CL – N occurs in 38.1% of the situations, Dem + N 22.1%, and *Dem –CL –N 30.35%. *Dem –CL –N is less frequent than Dem + (X)CL – N, but, unfortunately, more frequent than Dem + N.

What is worth mentioning is that, in the transcript, the child lengthens the vowel of the demonstrative, from *zhe* to *zhei*, in 19, or 10.5% of the cases, 18 of which have no classifier following it. A reasonable explanation is that the child has created a binary moraic foot classifier out of the monosyllabic demonstrative *zhe*. But, as there are a total of 95 demonstratives (Dem –CL + N (40)) + (Dem –CL –N (55)) that do not have a following classifier, lengthening the vowel for only 20% of them cannot be counted as a consistent device the child uses to create a binary foot.

I conclude that prosodic concerns do not cover much of the data discussed in this paper.

7. Conclusion and Further Direction

By examining the data, I contend that Bao-Bao has acquired the classifier system of Mandarin syntactically at 2;2.7, which supports the Strong Continuity Hypothesis (Lust 1999), despite the severe paucity of input stimulus from the caregiver. The omission or misuse of the classifiers is accounted for with the help of processing difficulties, the lexical complexity of the classifier system, and the alternative head-movement syntactic parameter that an adult would use only for marking definiteness. No significant phonological factor is found that sheds light on the data studied.

References

Aikhenvald, A. (2000). *Classifiers: A Typology of Noun Categorization Devices.* Oxford University Press.

Allen, K. (1977). Classifiers. *Language* 53, 285-311.

Biq, Y-O. (2004). Construction, reanalysis and stance: 'V yi ge N' and variations in Mandarin Chinese. *Journal of Pragmatics* 36, 1655-1672.

Bloom, P. (1990). Subjectless sentences in child language. *Linguistic Inquiry* 21, 491-504.

Boser, K., B. Lust, L. Santelmann and J. Whitman. (1992). The Syntax of CP and V2 in early child german (ECG): The strong continuity hypothesis. *Proceedings of the Twenty-Second Annual Meeting of The North East Linguistic Society* 22, 51-66.

Brown, R. (1973). *A First Language: The Early Stages.* George Allen and Unwin Ltd.

Carpenter, K. (1991). Later rather than sooner: Extralinguistic categories in acquisition of Thai classifiers. *Journal of Child Language* 18, 93-113.

Chao, Y-R. (1936). A note on Lia, Sa, etc. *Harvard Journal of Asiatic Studies.*

Chao, Y-R. (1968). *A Grammar of Spoken Chinese.* The University of California Press.

Cheng, L. (1997). On possession in Cantonese, Mandarin and Taiwanese. Handout from ICCL 6. Leiden University.

Cheng, L. (1999). Bare and not-so-bare nouns and the structure of NP. *Linguistic Inquiry* 30, 509-542.

Cheng, L. and R. Sybesma. (2005). Classifiers in four varieties of Chinese. In R. Kayne and G. Cinque, eds., *The Oxford Handbook of Comparative Syntax.* Oxford University Press.

Chien, Y-C., B. Lust and C-P. Chiang. (2003). Chinese children's comprehension of count-classifiers and mass-classifiers. *Journal of East Asian Linguistics* 12, 91-120.

Chien, Y-C. and K. Wexler. (1988). Children's acquisition of binding principles. Paper presented at the 13th annual Boston University Conference on Language Development.

Cinque, G. (1999). *Adverbs and Functional Heads: A Cross-linguistic Rerspective.* Oxford University Press.

Demuth, K. (1996). The prosodic structure of early words. In J. Morgan and K. Demuth, eds., *Signal to Syntax: Bootstrapping from Speech to Grammar in Early Acquisition*. Lawrence Erlbaum Press.

Duanmu, San. (1998). Zhongyi Lilun he Hanyu de Cichang Xuanze (Stress Theory and Chinese Word-Length Choice). *Zhongguo Yuwen (Chinese Linguistics)* 4, 246-254.

Duanmu, San. (2007). *The Phonology of Standard Chinese,* 2nd edition. Oxford University Press.

Erbaugh, M. (1986). Taking stock: The development of Chinese noun classifiers historically and in young children. In C. Colette, ed., *Noun Classes and Categorization.* John Benjamins Publishing Company.

Hu, Q. (1993). *The Acquisition of Chinese Classifiers by Young Mandarin-Speaking Children.* Ph.D. dissertation. Boston University.

Hyams, N. (1988). A principles-and-parameters approach to the study of child language. *Papers and Reports on Child Language Development* 27, 153-161.

Hyams, N. (2002). Clausal structure in child Greek: a reply to Varlokosta, Vainikka and Rohrbacher and a reanalysis. *Linguistic Review* 19, 257-300.

Li, A. (1999). Plurality in a classifier language. *Journal of East Asian Linguistics* 8, 75 -99.

Liu, H. (2009). Acquisition of Mandarin Aspects and Modals: evidence from the Acquisition of Negation. *Language and Linguistics* 10.1, 133-160.

Longobardi, G. (1994). Reference and proper names: A theory of N-movement in syntax and logical form. *Linguistic Inquiry* 25, 609-665.

Lü, S. ed. (1981). *Xiandai Hanyu Babaici (Eight Hundred Function Words in Modern Chinese).* Commerce Press.

Lust. B. (1999). University Grammar: The "Strong Continuity" hypothesis in first language acquisition. In T. Bhatia and W. Ritchie, eds., *Handbook of Child Language Acquisition.* Academic Press.

MacWhinney, Brian. (2000). The CHILDES project: Tools for analyzing talk. 3rd edition.

Naka, M. (1999) The acquisition of Japanese numerical classifiers by 2-4-year-old Children: The role of caretakers' linguistic inputs. *Japanese Psychology Research* 41, 70-78.

Roeper, Th. and B. Rohrbacher. (1994). Null Subjects in early child English and the theory of economy of projection. *University of Pennsylvania Working Papers in Linguistics* 2, 83-119.

Soja, N., S. Carey, and E. Spelke. (1991). Ontological categories guide young children's inductions of word meaning: Object terms and substance terms. *Cognition* 38, 179-211.

Tai, J. (1992). Variation in classifier systems across Chinese dialects: Toward a cognition-based semantic approach. *Chinese Language and Linguistics 1: Chinese Dialects,* 587-608.

Tang, J. (2005). Noun or classifiers: A non-movement analysis of classifiers in Chinese.

Language and Linguistics 6, 431-472.

Tardif, T. (1993). *Adult-to-Child Speech and Language Acquisition in Mandarin*. Ph.D. dissertation. Yale University.

Tse, S., H. Li and S. Leung. (2007). The acquisition of Cantonese classifiers by preschool children in Hong Kong. *Journal of Child Language* 34, 495–517.

Uchida, N. and M. Imai. (1999). Heuristics in learning classifiers: The acquisition of the classifier system and its implications for the nature of lexical acquisition. *Japanese Psychological Research* 41, 50-69.

Wexler, K. and R. Manzini. (1987). Parameters and learnability in binding theory. In T. Roeper and E. Williams, eds., *Parameter Setting*. Reidel.

Yamamoto, K. and F. Keil. (2000). The acquisition of Japanese numeral classifiers: Linkage between grammatical forms and conceptual categories. *Journal of East Asian Linguistics* 4, 379-409.

Yang, R. (2001). *Common Nouns, Classifiers and Quantification in Chinese*. Ph.D. dissertation. The State Univ. of New Jersey.

Zhang, H. (2007). Numeral classifiers in Mandarin Chinese. *Journal of East Asian Linguistics* 16, 43-59.

Haiyong Liu
Classical and Modern Languages, Literatures, and Cultures
471 Manoogian
Wayne State University
Detroit, MI 48202, USA
E-mail: an1884@wayne.edu

Received: September 15, 2007
Revised version received: November 26, 2008
Accepted: November 28, 2008