The Problem of Silent YEAR: A Mandarin Perspective

Florence Zhang-Yukun
Yale University

1 Overview

This abstract sketches a syntactic account for the "silent YEAR" issue in Mandarin.[1] Consider the contrast shown in (1). In (1a), an phonologically overt *suì* 'year' is obligatory after the numeral *bā* 'eight', while in (1b), *suì* 'year' is optional after *shíbā* 'eighteen'.

(1) a. *John **bā** *(sùi).*
John eight year$_{age}$
'John is eight years old.'
b. *John **shíbā** (sùi).*
John eighteen year$_{age}$
'John is eighteen years old.'

The rest of this abstract is organised as follows. §2 restates (Kayne 2005)'s original observation of silent YEAR and his generalisation. In §3, I show that Kayne's generalisation is challenged with three kinds of counterexamples, with a particular focus on the Mandarin case. In §5, I show that the silent YEAR issue is not a semantic/pragmatic issue nor a pure phonological phenomenon but rather involves syntactic factors, and present my analysis for it. One aim of this paper is to show that languages may vary greatly in age description. Instead of trying to make a universal claim, I focus on analysing only the Mandarin pattern.

2 Introducing Silent YEAR

Kayne (2005) observes that languages differ with respect to whether they allow bare numerals to describe age. For example, English is a language where a bare numeral without *year(s)* is felicitous in describing age, seen in (2), whilst French and Italian do now allow such constructions, seen in (3).

(2) English
a. Tom is **three**.
b. At the age of **seven**, John started to learn French.

(3) a. French
*A l'âge de sept *(ans), John*
at the-age of seven year.PL, John ...
'At the age of seven, John ...'
b. Italian
*All'età di sette *(anni), Gianni*
to-the-age of seven year.PL, Gianni ...
'At the age of seven, Gianni ...'

[1]The abbreviations are as follows: 3 = third person, CLF = classifier, COP = copula, DECL = declarative, NOM = nominative, PL = plural, SG = singular, SUPP = suppletive. Capital letters are used to indicate silence.

Kayne argues for the structure (4), which involves a silent AGE and a silent YEAR. Of our interest here is the silent YEAR. Kayne argues that such silent YEAR is possible in a language only if the language **either prenominal adjectives or overt prenominal classifiers productively can have no number agreement**. The original statement is shown in (5).

(4) AGE_1 F° [numeral **YEAR**] t_1 (Kayne 2005:252)

(5) Silent YEAR is possible in a given language only if in that language either prenominal adjectives or overt prenominal classifiers without (the equivalent of) of (or both) can (productively) be unaccompanied by a plural morpheme.

3 Challenging Kayne's Generalisation

Kayne's generalisation is challenged with three kinds of counterexamples.

3.1 Counterexample #1: French

The first counterexample comes from French. Kayne's generalisation hinges on the assumption that silent YEAR is incompatible with the plural agreement morpheme. Therefore, from (5) we predict that silent YEAR is possible for 'one year old' even in French, contrary to fact.

(6) French
*Le bébé a un *(an).*
the baby have one year
'The baby is one year old.'

3.2 Counterexample #2: German

The German case constitutes the second counterexample. German adjectives can have plural agreement morphemes. However, silent YEAR is possible in German, contradicting (5).[2]

(7) German
a. *schön-**e*** *Bäun-**e***
beautiful-PL tree-PL
'beautiful trees'
b. *John ist sieben (Jahr-e).*
John be.3SG seven year-PL
'John is seven years old.'

3.3 Counterexample #3: Mandarin

The most several issue underlying (5) is that it presupposes a language can either have silent YEAR or not have silent YEAR. Mandarin immediately falsifies this claim, since only integers no greater than ten fail to license YEAR (8a), while larger numbers are felicitous with it (8b).

(8) Mandarin
a. *John jīnnián {yí/ liǎng/ sān/ sì/ wǔ/ liù/ qī/ bā/ jiǔ/ shí} *(suì).*
John this-year one two three four five six seven eight nine ten year
Intended: 'John is 1/2/3/4/5/6/7/8/9/10 year(s) old this year.'

[2]According to my consultant, *Jahre* 'years' is more naturally followed by *alt* 'old' if it is overt.

b. *John jīnnián {shíèr/ sānshí/ wǔshíyī/ yìbǎi} (suì).*
John this-year twelve thirty fifty-one one-hundred year
'John is twelve/thirty/fifty-one/one-hundred years old this year.'

Moreover, not all language have number agreement, so it is also unclear how (5) can be applied really crosslinguistically in the first place.

4 A Note on the Semantics of YEAR

It needs to be pointed out in passing that YEAR is not merely a duplicate item that happens to be silent. YEAR should be taken as a separate lexical item as opposed to the overt version, since they can have different distribution. Specifically, the distribution of YEAR seems to be a subset to that of the overt counterpart.

In English, for example, YEAR is compatible with human beings, shaky for animals and plants, and almost impossible for lifeless entities. Sentences in (9) are adapted from Kayne (p.252).[3]

(9) a. That child is eleven {years old/ years of age/ ∅}.
b. This dog is fifteen {years old / $^{(?)}$years of age / $^{(?)}$∅}.
c. That tree is two hundred {years old / $^{??}$years of age / $^{??}$∅}.
d. The Earth is five billion {years old $^{*?}$years of age $^{*?}$∅}.
e. The theory of relativity is one hundred {years old/ *years of age/ *∅}.

In Mandarin, too, silent YEAR is more restricted compared to the overt *suì* 'year old'. It is mostly used with human beings, and is infelicitous with lifeless entities.

(10) Mandarin
a. *Háizi shíyī {suì/ ∅}.*
chile ten-one year.old
'The child is eleven years old.'
b. *Gǒu shísān {suì/ $^{?}$∅}.*
dog ten-three year.old
'The dog is thirteen years old.'
c. *Dìqiú wǔshíyì {$^{(?)}$suì/ *∅}.*
earth five.billion year.old
'The earth is five billion years old.'

5 Analysis

5.1 Proof that the issue is not semantic

The silent YEAR issue in Mandarin cannot be boiled down to semantics/pragmatics. The examples in (8a) sound **categorically ungrammatical**. It is worthwhile to note that even examples in (11) sound better than (5), even though the ages in (11) are impossible in reality.

(11) *#John jīnnián {yìbǎibāshí/ liǎngbǎilíngwǔ/ yìqiān} (suì).*
John this-year one-hundred-eighty two-hundred-five one-thousand year

[3] A similar distribution is also reported from German. I thank one anonymous reviewer for bringing up this point.

'John is 180/250/1000 years old this year.'

5.2 Proof that the issue is not purely phonological

One may also want to use prosodic constraints to account for the Mandarin case under the Fengian (Feng 2019) framework, since those that are ungrammatical with silent YEAR (8a) happen to be monosyllabic. The pattern may arise as a result of Mandarin's preference of disyllabicity.

However, Korean, a language which to my knowledge is not argued to have similar prosodic constraints like Mandarin Chinese, has exactly the same pattern (12). Whether a numeral is compatible with silent YEAR is only relevant with its complexity, but not the number of syllables. In (12a) which involves simplex numerals, *twul* 'two' and *yel* 'ten' are monosyllabic, and *tases* 'five' and *yetelp* 'eight' are disyllabic. All of them are incompatible with silent YEAR. On the other hand, complex numerals such as in (12b) admit silent YEAR, again regardless of whether it is monosyllabic or disyllabic.[4]

(12) Korean

a. *John-i {twul/ tases/ yetelp/ yel} *(sal)-i-ta.*
John-NOM two five eight ten year-COP-DECL
'John is two/five/ eight/ten years old.'

b. *John-i {yelyetelp/ sumwu(l)/ swuyn} (sal)-i-ta.*
John-NOM eighteen twenty fifty year-COP-DECL
'John is eighteen/twenty/fifty years old.'

One may still want to ascribe the Mandarin pattern to some special phonologies of numerals in Mandarin under frameworks like Lexical Phonology (Kiparsky 1982) or Cophonologies-by-Ph(r)ase (Sande, Jenks & Inkelas 2020). Such attempts would struggle to account for the examples in (13). It is only when numerals are used to denote age that monosyllabic numerals are ungrammatical; no problem arises under the arithmetic use.

(13) a. Arithmetic Use
*{**Bā**/ Shíbā} shì yí gè hǎo shùzì.*
eight eighteen COP one CLF good number
'Eight/Eighteen is a good number.'

b. Age Use
*{**Bā**/ ^{OK}Shíbā} shì yí gè hǎo niánjì.*
eight eighteen COP one CLF good age
'Eight/Eighteen is a great age.'

In fact, data from Shanghainese and Cantonese show that both phonology and syntax may be in effect for some languages. However, at this point it should be clear that there must be some **syntactic reasons** that derive the contrast between simplex numerals e.g. *bā* 'eight' and complex numerals e.g. **shíbā* 'eighteen' in age description in Mandarin.

[4]While ten's multiples from 20 to 90 are seemingly not decomposable, they have identifiable polymorphemic etymologies.

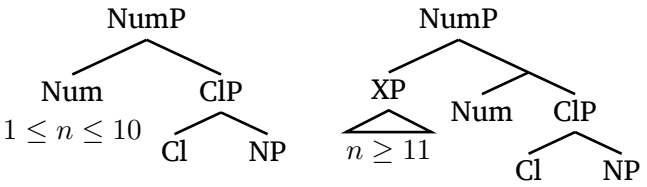
5.3 A syntactic account

First, notice that age descriptions, even without an overt *year*, should involve the same numeral-classifier construction as in 'There are three CLF apples', i.e. [$_{\text{NumP}}$Num° [$_{\text{ClP}}$Cl° [NP]]] (see Cheng & Sybesma (1999) and Tang (2011) *i.a.*). This is evidenced by the at-least reading (see Barwise & Cooper (1981) and Spector (2013)) of numerals in age seen in (14).

(14) ***Shíbā*** *cái néng jìnrù zhè jiā jiǔbā.*
eighteen only can enter this CLF bar
'Only those who are eighteen (and above) can enter the bar.'

I assume that different numerals merge in different positions, which is not a novel view (Chen 2024, Wu 2024). I argue that simplex numerals merge as Num°, while complex numerals merge as XP in Spec,NumP where Num° is empty, shown in (15). I claim that different complex numerals should have different internal structures, and 'XP' is a notation that stands for whichever label applies in a given case. To save space, I do not discuss in this abstract the internal structure of complex numeral.

(15)

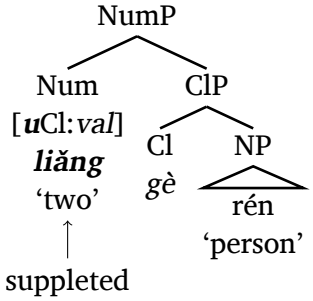


One argument favouring (15) is that for numerals that have a suppletive counting form (*yī→yí/yì* 'one', *èr→liǎng* 'two'), the suppletive form is only used if the numeral is used as simplex (16a), but not under a complex one (16b). See He (2015) and Wu (2024) for more discussions. I take such suppletions to be the exponence of Num°'s agreement with Cl°, which is covert for numerals from three to ten.[5]

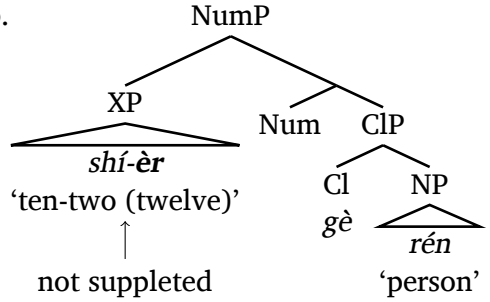
(16) a. Suppletion *èr→liǎng* Triggered
{liǎng/ ****èr}*** *gè rén*
two.SUPP two CLF person
'two people'

b. Supp. *èr→liǎng* Not Trigger'd
*[shí-{****liǎng/*** ***èr}] gè rén***
ten-two.SUPP two CLF person
'twelve people'

(17) a.



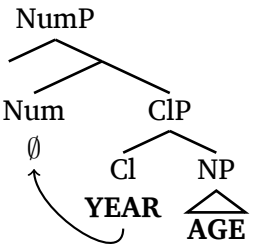
b.



Now let's move on to the silent YEAR issue. I align with Kayne in arguing that two silent categories are involved, the NP AGE and the classifier YEAR. The NP AGE is silent by itself, while the silence of the classifier YEAR is licensed in syntax by incorporation in to an empty Num°.

[5]For Old-School Beijing Mandarin and some Northern Mandarin dialects, *sān* 'three', *qī* 'seven' and *bā* 'eight' also have distinct forms when used as simplex in counting.

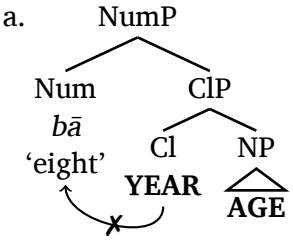
(18)



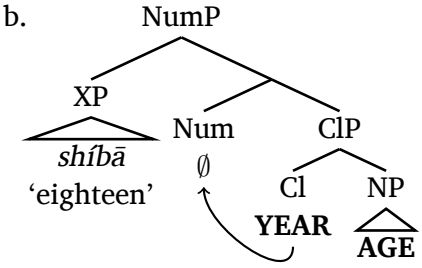
The pattern shown at the beginning, repeated in (19), directly follows from the structure of simplex/complex numerals and the assumption about the license of YEAR. Since simplex numerals merge as Num°, the classifier *suì* 'year' cannot incoporate into Num° to have its silence licensed. On the other hand, complex numerals merge in Spec,NumP with an empty Num°, the silencing of YEAR is licensed by incorporation.

(19) a. **John* ***bā.***
John eight
Intended: 'John is eight years old.'
b. *John* ***shíbā.***
John eighteen
'John is eighteen years old.'

(20) a.



b.



6 Conclusion

I revisit the silent YEAR problem first noted by Kayne and demonstrate that his generalisation does not hold cross-linguistically. The Mandarin case is particularly interesting in that the silent YEAR is grammatical only with complex numerals but not simplex ones. I provide a syntactic account where the different structures of NumP with simplex and complex numerals and a licensing condition of the classifier YEAR derive this divided pattern.

At the same time, further cross-linguistic data is called for, especially for languages that use non-decimal counting systems. Given so many potential factors involved (structure of the numerical system, structure of NumP, prosody, etc.), it would not be surprising at all to find great variation across languages in whether YEAR is possible and how YEAR is licensed.

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