Licensing D in Classifier Languages and "Numeral Blocking"

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1 Introduction

A much discussed question related to numeral classifier languages[1] is how they encode definiteness, and whether there are differences among classifier languages with respect to this property. Cheng and Sybesma (1999) was an early attempt to systematically provide a syntactico-semantic explanation for differences observed between Mandarin Chinese (henceforth MC) and Cantonese, with respect to the noun phrase configurations which give rise to a definite interpretation. Cantonese exhibits noun phrases composed of a bare classifier[2] followed by a noun (Cl–N phrases), which can be interpreted as a definite noun phrase, whereas MC only allows an indefinite interpretation for Cl–N phrases. Furthermore, in both languages, the presence of a numeral always forces an indefinite interpretation, regardless of whether Cl–N can be definite in that language.

In this paper I discuss the standard explanation for the definite interpretation associated with bare classifiers in Cantonese, and the related explanation for the 'blocking' effect that the numeral has on definiteness, which has previously been tied to the Head Movement Constraint (HMC). I show that the numeral blocking effect extends to other classifier languages, including two languages where there is an overt morphological instantiation of definiteness on the classifier. I then argue that the standard HMC explanation of numeral blocking does not work in light of morphological facts from one of these languages, under a certain set of well-motivated assumptions about the structure of the DP. I ultimately conclude that a revised analysis, involving two separate structures for Cl-N phrases and phrases with a numeral is required, and that a consequence of this analysis, that numerals form a

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[1] Throughout I use the term 'classifier languages' to mean 'numeral classifier languages'.

[2] 'Bare' here is intended to indicate the absence of a numeral. Many classifier languages, such as Japanese, disallow classifiers where no numeral is present.

constituent with the classifier to the exclusion of the noun, is supported by typological evidence related to word order in classifier languages.

In the next section I introduce the relevant data from MC and Cantonese, before introducing the analyses in Cheng and Sybesma (1999) and Simpson (2005).[3]

2 Definiteness in MC and Cantonese

Both Mandarin Chinese (MC) and Cantonese are what I will refer to as 'classifier languages', that is, languages which employ a set of morphemes to categorize or classify the noun that they co-occur with. The classifiers discussed here are sometimes referred to as Numeral Classifiers (Aikhenvald, 2000), particularly given that they obligatorily appear when a numeral is present. Both languages allow bare nouns, noun phrases composed of a classifier-noun sequence (Cl–N phrases) and noun phrases composed of a numeral-classifier-noun sequence (#–Cl–N[4] phrases) in argument position. However, there are a number of interesting constraints on where each type of noun phrase can appear. Furthermore, these constraints differ between the two languages, as discussed in depth in Cheng and Sybesma (1999).

Overall, the possible interpretations available to different noun phrases in MC and Cantonese depend on the shape of the noun phrase: in particular, whether it is a bare N, a Cl–N, or a #–Cl–N. Jenks (2012) points out that the difference between MC and Cantonese noun phrase distribution and interpretation can be subsumed under a larger generalization that appears to hold quite robustly across a number of Sino-tibetan and Austroasiatic classifier languages including Hmong, Cantonese, MC, Min, and Vietnamese.[5] The generalization takes the form of two one-way entailments: if a classifier language has bare nouns which can be interpreted as definite, then Cl–N phrases will not be interpreted as definite; if a classifier language has Cl–N phrases which can be interpreted as definite, then bare nouns will not be interpreted as definite.[6]

(1)   Noun phrase interpretation in classifier languages

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[3]Much of the paper is a revised version of parts of chapters 4 and 5 of Hall (2015).

[4]Throughout, I will use # as an abbreviation for 'numeral'.

[5]Note that Trinh (2011) claims that bare nouns cannot be definite in Vietnamese, but Nguyen (2004) and Jenks claim otherwise. See also Simpson et al. (2011) for a challenge to the complementarity of definite bare Ns and definite Cl–N phrases.

[6]We will see an example of a language in section 4.1, Wenzhou Wu, which is a counter-example to this generalization.

a. Bare N [±def] → Cl–N [−def]   Type A language

b. Cl–N [±def] → Bare N [−def]   Type B language

MC is a Type A language: it exhibits definite bare nouns and Cl–N phrases which are obligatorily indefinite. Cantonese is a Type B language: it has definite Cl–N phrases and obligatorily indefinite bare nouns. Another generalization that can be added to the above is that, regardless of the availability of a definite interpretation for a Cl–N phrase, the presence of a numeral always blocks a definite interpretation.

(2)   #–Cl–N [−def]   Type A&B languages

My focus in this paper is Type B languages; in particular on the definite interpretation associated with Cl–N phrases, and the reasons why (2) holds in those languages. In the next subsection I lay out the full set of facts related to MC and Cantonese, before introducing two previous analyses of the differences between the two languages.

2.1   Mandarin Chinese - A 'Type A' classifier language

MC is what I will refer to as a 'type A' classifier language (following the generalization in (1)).[7] In postverbal object position, bare nouns can have either definite or indefinite interpretation whereas in preverbal subject position (or topic position), bare nouns cannot be interpreted as indefinite (3a), because of a general restriction on the preverbal subject position which means that indefinite noun phrases cannot appear there (Huang et al. 2009, p288, and references cited therein). Noun phrases with a demonstrative are also acceptable in preverbal subject position (3b), and can take on an anaphoric definite interpretation (in the sense of Schwarz 2009; see Jenks 2015).[8].

(3)   a.   *gou chi-le   dangao*
           dog eat-PRF cake

           'The dog ate the cake/a cake.' NOT 'a dog ... '

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[7]Note that throughout I discuss sortal classifiers, and not mensural classifiers, or 'massifiers' to use Cheng and Sybesma (1998)'s term. I believe that massifiers have a different structure, which is evidenced by their different properties (a modifier can appear between the massifier and the noun, a modification marker *de* is optionally present). See Cheng and Sybesma (1998) and Cheng and Sybesma (1999) for discussion.

[8]Judgements on example sentences are taken directly from the literature, unless otherwise stated

b. *nei-zhi gou chi-le dangao*
that-CL dog eat-PRF cake

'That/the dog ate the cake/a cake.'

Bare count nouns are number neutral, and thus can refer to either singular objects or pluralities. Bare nouns can also refer to mass objects (examples taken from Cheng and Sybesma 1999, with some modification):[9]

(4) a. *Hufei mai shu qu le*
Hufei buy book go SFP

'Hufei went to buy a book/books/the book(s).'

b. *Hufei he-wan-le tang*
Hufei drink-finish-PRF soup

'Hufei drank the soup/some soup.'

Where a noun is accompanied by a numeral, a classifier is obligatorily present (5),[10] and the #–Cl–N phrase is obligatorily indefinite. Cl–N phrases are also possible without a numeral, and are obligatorily indefinite and singular (6).[11] Because of the 'definiteness constraint' on preverbal subject position, Cl–N and #–Cl–N phrases are degraded in this position (7).

(5) *wo xiang mai liang *(ben) shu*
I want buy two CL book

'I want to buy two books.'

(6) *wo xiang mai ben shu*
I want buy CL book

'I want to buy **a** book.' NOT 'I want to buy (some) books.'

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[9]I focus here on definite and indefinite interpretations, and put aside kind and generic interpretations, which bare nouns can also take on. For discussion of kind and generic interpretations in MC, see Krifka (1995).

[10]Although see Tao (2006) for a discussion of the phenomenon of classifier reduction (of the general classifier *ge*) in spoken Beijing Mandarin Chinese.

[11]A possible exception is the classifier-like plural marking element *xie*, which I put aside here. See Hall (2015), section 4.2.3 for discussion.

(7) a.?? *san-ge   xuesheng chi-le   dangao*
         three-CL student   eat-PRF cake
         Intended: 'Three students ate the cake.'

    b. * *ge xuesheng chi-le   dangao*
         CL student   eat-PRF cake
         Intended: 'A student ate the cake.'

2.2   Cantonese – a 'Type B' classifier language

Cantonese is what I refer to as a 'type B' classifier language (following the generalization in (1)). In postverbal object position, Cl–N phrases can have either definite or indefinite interpretation (8) whereas in preverbal subject position (or topic position), Cl–N phrases can only be definite (9). As with MC, Cl–N phrases are always singular.[12] Bare nouns, on the other hand, are obligatorily indefinite (thus being unacceptable in preverbal subject position, (9a)), and are number neutral. Examples here are again taken from Cheng and Sybesma (1999).[13]

(8) *Ngo⁵ soeng² maai⁵ bun² syu¹ (lei⁴   tai²)*
     I   want   buy   CL   book come read
     'I want to buy a book (to read).'

(9) a. * *gau² soeng² gwo³ maa⁵lou⁶*
         dog want   cross road
         Intended: 'the dog wants to cross the road.'

     b. *zek³ gau² soeng² gwo³ maa⁵lou⁶*
         CL   dog want   cross road
         'The dog wants to cross the road.', NOT 'a dog ... '

(10) *Wufei heoi³ maai⁵ syu¹*
      Wufei go   buy   book
      'Wufei went to buy a book/books.'

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[12]Again, this is with the exception of nouns that appear with the 'plural classifier' *di¹*, which I discuss in Hall (2015), section 4.2.3.

[13]Superscript numbers on Cantonese examples indicate tone.

As with MC, #–Cl–N phrases are always interpreted as indefinite, and thus are infelicitous in preverbal subject or topic position (examples elicited from a native Cantonese speaking informant). Here I include a Cl–N phrase (which gets a definite interpretation) for contrast.

(11) a. *zek³ gau² sik⁶-gan² juk⁶*
          CL   dog   eat-PROG meat
          'The dog is eating meat'

  b. * *loeng⁵-zek³ gau² sik⁶-gan² juk⁶*
        two-CL   dog   eat-PROG meat
        Intended: 'the two dogs are eating meat.'

2.3 Summary

In summary, we have the following set of interpretations, associated with particular noun phrase configurations, available in the two languages:

(12)

Noun phrase config	Definite	Indefinite	Number
MC			
N	✓	✓	Neutral
Cl–N	*	✓	Sg
#–Cl–N	*	✓	Sg/Pl (# dependent)
Cantonese			
N	*	✓	Neutral
Cl–N	✓	✓	Sg
#–Cl–N	*	✓	Sg/Pl (# dependent)

What is important here is that we have a language, i.e., Cantonese, where a definite interpretation is possible in a noun phrase composed of a bare classifier followed by a noun, but where the introduction of a numeral always blocks a definite interpretation. An account of the interpretive differences in noun phrases between the two languages will focus on two facts:

1. Cl–N can be definite in Cantonese, but not in MC.

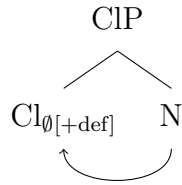2. #-Cl–N is always indefinite in both languages.

In the next section I introduce two previous accounts of these facts.
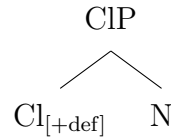
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3 Previous Accounts

3.1 Cheng and Sybesma 1999

Cheng and Sybesma (1999) offered the first account of the above distribution of interpretations across different noun phrase configurations. They argue that the Cl head in MC and Cantonese plays the (semantic) role that D does in English, that of introducing a definite interpretation through an iota operator. Following Chierchia (1998b), this is introduced either directly as a definite classifier, as in Cantonese, or as a type-shifting last resort operator where no definite lexical item is available, as in MC. Cheng and Sybesma also propose that a necessary step for the last resort type-shifting in MC is N-to-Cl movement, which is why bare Ns can have a definite interpretation in that language. So, in Cantonese, the classifier is an overt definite article, giving definite Cl–N phrases, and in MC, N moves to the empty Cl projection giving definite bare nouns.[14]
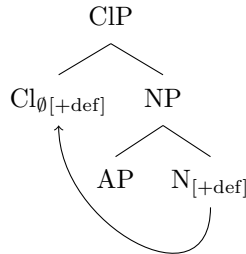
(14) MC

$$
\begin{array}{c}
\text{ClP} \\
\diagup\diagdown \\
\text{Cl}_{\emptyset[+\text{def}]} \quad \text{N}
\end{array}
$$

(15) Cantonese

$$
\begin{array}{c}
\text{ClP} \\
\diagup\diagdown \\
\text{Cl}_{[+\text{def}]} \quad \text{N}
\end{array}
$$

Simply put then, the difference between MC and Cantonese lies in how the

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[14]Cheng and Sybesma accept that this movement would result in an illicit ordering of the adjective and noun, if the adjective merges lower than Cl, and the noun moves up to Cl:
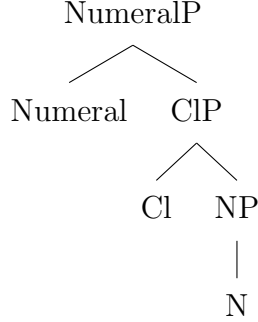
(13) Predicted order: N≻Adj

$$
\begin{array}{c}
\text{ClP} \\
\diagup\diagdown \\
\text{Cl}_{\emptyset[+\text{def}]} \quad \text{NP} \\
\diagup\diagdown \\
\text{AP} \quad \text{N}_{[+\text{def}]}
\end{array}
$$

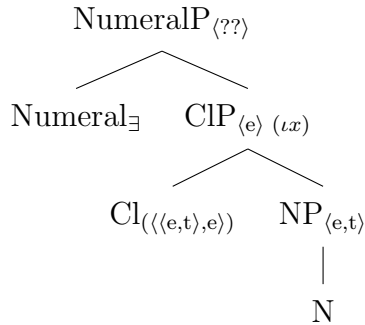They therefore claim that the movement has to be covert.

definiteness 'feature' encoded in the Cl head is licensed. The fact that numerals block definiteness in both languages is argued to arise from the fact that all indefinite Cl–N phrases involve the projection of a Numeral head above ClP, as in (16).

(16)   Indefinite Cl–N phrase

```
              NumeralP
             /        \
       Numeral        ClP
                     /    \
                   Cl      NP
                            |
                            N
```

Numerals are claimed to fundamentally involve existential quantification, and therefore the merger of a Numeral head has the effect of "undoing the definiteness" (p528). From the perspective of compositional semantics, however, this doesn't entirely make sense. In the system proposed in Chierchia (1998b) (based ultimately on Partee 1987's set of type-shifters), the iota-operator takes a property and returns a unique individual (of type $\langle e \rangle$), whereas the existential operator takes a property and returns a generalized quantifier (of type $\langle \langle e,t \rangle, e \rangle$). If we compose the property introduced by N with the iota operator first at Cl, then an existential quantifier introduced at Numeral would not be able to compose with the resultant individual (of type e).

(17)

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                 NumeralP_⟨??⟩
                /            \
        Numeral_∃          ClP_⟨e⟩ (ιx)
                          /          \
           Cl_(⟨⟨e,t⟩,e⟩)            NP_⟨e,t⟩
                                       |
                                       N
```

The individual is bound by the iota operator at the ClP level, meaning that it can no longer be quantified over in the way suggested by Cheng and

Sybesma.[15] If, on the other hand, the notion of "undoing" of definiteness is intended to mean that an iota operator is never present in Cl when a numeral is merged, then this becomes a simple stipulation, and a restatement of the facts. Because of the inexplicit nature of the explanation, I put aside Cheng and Sybesma's approach to Numeral Blocking, and instead focus on a related proposal that builds on Cheng and Sybesma's initial insights. The standard account which avoids the problems discussed immediately above is developed in Simpson (2005), where the locus of definiteness is not Cl, but D, assuming that DPs are universal, even where a language does not exhibit overt articles.
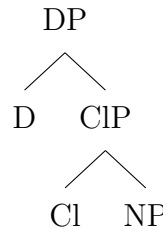
3.2   The DP Account

The DP account of the MC and Cantonese facts is proposed by Simpson (2005), (and defended by Wu and Bodomo (2009)). They build on the ideas in Cheng and Sybesma (1999), but crucially differ in that they take D to be the locus of definiteness following Longobardi (1994). The central idea is that it is head movement of Cl to D in Cantonese that gives rise to the definite interpretation of Cl–N phrases. Definite D must be overtly instantiated by some lexical element to be licensed, and so a lack of movement of the classifier to the D head results in an indefinite Cl–N configuration.

(18)   Cantonese Cl–N [+def]

```
            DP
           /  \
      D[+def]  ClP
        ↑      /  \
      Cl[+def]    NP
```
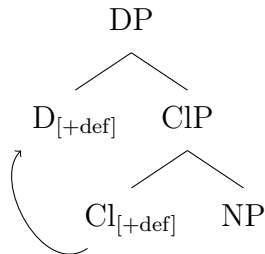
(19)   Cantonese Cl–N [−def]

```
          DP
         /  \
        D    ClP
            /  \
          Cl    NP
```

In MC, this movement is not available, presumably because the Cl does not come with a definiteness feature. This means that a bare Cl–N phrase never receives a definite interpretation.[16]

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[15]It is possible to introduce a covert type-shifter (IDENT or Id in Partee's terms) to take ClP from $\langle e \rangle$ to $\langle e,t \rangle$ so that it could combine with the numeral. This would put us in the position of saying that the iota operator applies only to have the type shifted back by the covert partial inverse of iota, which is hardly satisfying. It would again in effect be the same as saying that "numerals undo definiteness", or that the merger of a numeral must be preceded by composition of ClP with a covert operator that undoes definiteness.

[16]There is no discussion of how bare nouns get a definite interpretation under this analysis: however it has been suggested that it involves N-to-D movement of the type

An advantage of this head movement approach is that it can straightforwardly account for the fact that numerals block definiteness in Cantonese, without any awkward stipulations. Although the exact syntactic position of the numeral is not explicitly discussed in Simpson (2005), the discussion suggests that the numeral is introduced as a heads above ClP. This means that the Numeral head will act as an intervenor for Cl-to-D movement, as per the Head Movement Constraint of Travis (1984), and will therefore block a definite interpretation.

(20) The Head Movement Constraint (HMC)

An X^0 may only move into the Y^0 which properly governs it.

(21)

DP
D[+def] NumeralP
Numeral (*intervenor*) ClP
Cl[+def] NP
N
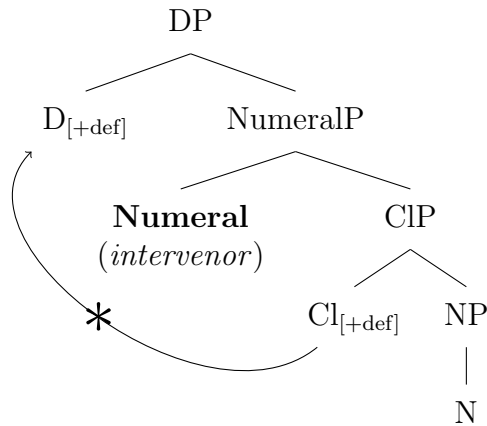
This is a simple and elegant explanation of the numeral blocking effect. No stipulation of the "undoing of definiteness" is required, and we have a straightforward explanation in terms of locality and teh interaction of syntactic features and interpretation. However, in the remainder of this paper, I intend to show that it is not the simplest account when we take other classifier languages into consideration, and on certain well motivated assumptions about the structure of the DP.

In the next section I will show that numerals blocking definiteness is not a peculiarity of Cantonese, and in fact extends to other classifier languages. Furthermore, morphological facts from one language in particular, Weining

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discussed in Longobardi (1994), although with common nouns, not just proper nouns. Such an analysis has problems of its own, but I will not discuss them here for reasons of space. See footnote 20 for further discussion.

Ahmao, suggest that the simple HMC explanation of the Numeral Blocking effect proposed by Simpson could not be correct, and in order to explain the full set of typological facts, two different structures will be proposed for #–Cl–N and bare Cl–N phrases.

4 Numerals block definiteness: cross-linguistic considerations

The blocking effect of numerals is a general effect that can be seen in other classifier languages. Cantonese classifiers are able to signal definiteness without any difference in the morphological shape of the classifier. That is to say, a Cl–N sequence is interpreted as either definite or indefinite depending on context, rather than the shape of the classifier which accompanies the noun. This is also true of other classifier languages, including Vietnamese and Nung. However, there are classifier languages spoken in China which exhibit 'inflecting' classifiers; that is, classifiers whose morphology encodes different interpretive features of the noun phrase. The striking fact about those languages is that, even though definiteness can be overtly marked on the classifier, the presence of a numeral always blocks definiteness, and prevents the definite form of the classifier from being used. I give a description of the classifier morphology of two languages which exhibit inflecting classifiers in the following subsections, and show that these languages also appear to exhibit the same numeral blocking effect as Cantonese.

4.1 Wenzhou Wu

The southern Wu variety spoken in Wenzhou is a local dialect of one of the ten major varieties of Chinese, Wu. Cheng and Sybesma (2005) discusses the different interpretive possibilities for different noun phrase configurations in four varieties of Chinese, including Wenzhou Wu (WW). They note that WW bare nouns have the same distribution as MC bare nouns, in that they can be either definite or indefinite in object position, and can only be interpreted as definite in subject position.

Cl–N phrases, however, differ from both MC and Cantonese. While WW is similar to Cantonese in allowing a definite interpretation for Cl–N phrases, it differs from Cantonese in that a definite interpretation for a Cl–N phrase is signalled by a shift in the tone of the classifier. As Cheng and Sybesma (2005) discuss in detail, the 8 lexical tones of the language can be divided into 4 subgroups (A, B, C, and D), each subgroup containing two register

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subclasses, 'hi' and 'lo'. I reproduce a table presenting the tone values for each lexical tone here (contour values taken from Norman 1988):

(22)

1: hi-A	2: lo-A	3: hi-B	4: lo-B	5: hi-C	6: lo-C	7: hi-D	8: lo-D
44	31	45 (abrupt)	24 (abrupt)	42	11	23	12

In an indefinite noun phrase containing a classifier, the classifier carries its underlying, lexically specified tone. However, when the tone of the classifier shifts to a D tone (no matter what the underlying lexical tone of that particular classifier is), the Cl–N phrase is interpreted as definite. Thus, when definite, hi-A (tone 1), hi-B (tone 3), hi-C (tone 5) all shift to hi-D (tone 7), and hi-D (tone 8) also surfaces as hi-D. Lo-A (tone 2), lo-B (tone 4), lo-C (tone 6) and lo-D (tone 8) all surface as lo-D. A change in the morphology of the classifier gives rise to a change in interpretation. A minimal pair can be shown for a Cl–N phrase in object position (23), where a Cl–N phrase is acceptable under both a definite and an indefinite reading, the difference in meaning being indicated only by tone on the classifier.

(23) a. $\dot{\eta}^4$ φi^3 ma^4 **paŋ³** $s\dot{\imath}^1$
        I   want buy $\text{CL}_{\text{B-tone}}$ book
        'I want to buy **a** book'

   b. $\dot{\eta}^4$ φi^3 ma^4 **paŋ⁷** $s\dot{\imath}^1$
        I   want buy $\text{CL}_{\text{D-tone}}$ book
        'I want to buy **the** book'

Because of a ban on indefinite preverbal subjects (similar to that of MC and Cantonese), Cl–N phrases in subject position with an underlying 'indefinite' classifier tone (i.e., any non-D tone) are unacceptable:

(24) a. * $d\gamma u^2$ kau^8 i^5 $tsau^3\text{-}ku^5$ $ka^1løy^6$
        $\text{CL}_{\text{A-tone}}$ dog want walk-cross street
        Intended 'a dog wants to cross the street'

   b. $d\gamma u^8$ kau^8 i^5 $tsau^3\text{-}ku^5$ $ka^1løy^6$
        $\text{CL}_{\text{D-tone}}$ dog want walk-cross street
        'the dog wants to cross the street'

As shown by the example in (24b), a D-tone alternative is well formed, but produces a definite interpretation.

What about when numerals are combined with Cl–N phrases? Cheng and Sybesma point out that classifiers preceded by numerals keep their underlying tone, and #–Cl–N phrases are necessarily interpreted as indefinite. That is, definite morphology on the classifier is blocked when a numeral merges, and a #–Cl–N phrase cannot have a definite interpretation.

(25) $\dot{\eta}^4$ φi^3 ma^4 η^4 ***paŋ³*** $s\dot{i}^1$ le^2 $tsh\dot{i}^5$
      I   want buy four CL$_{\text{B-tone}}$ book come read
      'I want to buy four books to read'

This is another example of a case where the ability of a classifier to encode definiteness is blocked by a numeral, but where there is an overt morphological reflex of definiteness.

4.2   Weining Ahmao

A second, and here crucial example of 'inflecting' classifiers is the fascinating case of Weining Ahmao (Gerner and Bisang 2008, 2010). A Miao-Yao language spoken in western Guizhou province, Weining Ahmao (WA) encodes not only definiteness, but also number and 'size' (diminutive, medial and augmentative) on the classifier. The function of the 'size' inflection goes beyond encoding literal size; it mainly carries a socio-pragmatic function whereby the particular choice of classifier form indexes the gender and age of the speaker.[17] Male speakers typically use augmentative forms of the classifier, female speakers the medial form, and children the diminutive form. Although this third aspect of classifiers in the language is particularly rare and interesting, I put aside discussion of the socio-pragmatic facts here, and concentrate instead on number and definiteness; I direct the reader to Gerner and Bisang (2008, 2010) for an in depth discussion of the socio-pragmatic nuances of classifier use in the language.

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[17]The only other vaguely similar socio-pragmatic classifier function that I am aware of is exhibited in Assamese, where there are four separate classifiers for humans, but which differ with respect to the status of the human that is being referred to (Aikhenvald, 2000, pp102-103):

(i)

Human males of normal rank (respectful)	Female animals; human females (disrespectful)	High-status humans of any sex	Humans of either sex (respectful)
zɔn	zɔni	zɔna	gɔraki

The table in (26) gives the abstract summary of the forms of classifiers in Weining Ahmao that Gerner and Bisang (2008) produce (p.721):

(26)

Gender/Age	Size	Singular		Plural	
		Definite	Indefinite	Definite	Indefinite
Male	Augmentative	CVT	C*VT	$ti^{55}a^{11}$CVT′	$di^{31}a^{11}$C*VT′
Female	Medial	Cai^{55}	$C*ai^{213}$	$tiai^{55}a^{11}$CVT′	$diai^{213}a^{11}$C*VT′
Children	Diminutive	Ca^{53}	$C*a^{35}$	$tia^{55}a^{11}$CVT′	$dia^{55}a^{11}$C*VT′

Taking the augmentative (male) form to be the base form, C stands for simple, double or affricated consonant, V stands for simple or double vowel, T stands for tone, and the superscript numbers represent relative pitch on a scale from 1 (lowest) to 5 (highest). T′ indicates an altered tone from T, and * indicates a suprasegmental change in the consonant, such as aspiration or devoicing, although there is also sometimes an absence of sound changes. To illustrate the application of this abstract schema with a concrete example from the language, we take the classifier for animacy, tu^{44} (op. cit. p.722):

(27)

Gender/Age	Size	Singular		Plural	
		Definite	Indefinite	Definite	Indefinite
Male	Augmentative	tu^{44}	du^{31}	$ti^{55}a^{11}tu^{44}$	$di^{31}a^{11}tu^{44}$
Female	Medial	tai^{44}	dai^{213}	$tiai^{55}a^{11}tu^{44}$	$diai^{213}a^{11}tu^{44}$
Children	Diminutive	ta^{44}	da^{35}	$tia^{55}a^{11}tu^{44}$	$dia^{55}a^{11}tu^{44}$

As an example, (28) shows the four ways a male (adult) speaker can refer to oxen, with differences in number and definiteness being encoded solely on the classifier:

(28) a. *tu^{44}*   *$ɲɦu^{35}$*
          CL.AUG.SG.DEF ox
          'The ox'

      b. *du^{31}*   *$ɲɦu^{35}$*
          CL.AUG.SG.INDEF ox
          'An ox'

      c. *$ti^{55}a^{11}tu^{44}$*   *$ɲɦu^{35}$*
          CL.AUG.PL.DEF ox
          'The oxen'

      d. *$di^{31}a^{11}tu^{44}$*   *$ɲɦu^{35}$*
          CL.AUG.PL.INDEF ox
          '(Some) oxen'

14

Interestingly, constructions involving numerals are always interpreted as indefinite, and when a numeral (including numerals greater than 'one') is present, both definite forms and plural forms of the classifier are ungrammatical. A numeral therefore must occur only with an indefinite singular classifier (regardless of 'size'): all other combinations are ungrammatical (Gerner and Bisang 2010, p588).

(29) a. * i^{55} tai^{44} $\eta\hbar u^{35}$
         one CL.MED.SG.DEF ox
         Intended: 'the one (sole) ox'

      b. i^{55} dai^{213} $\eta\hbar u^{35}$
         one CL.MED.SG.INDEF ox
         'one ox'

(30) a. * tsi^{55} la^{53} tau^{55}
         three CL.DIM.SG.DEF hill
         Intended: 'the three hills'

      b. tsi^{55} la^{35} tau^{55}
         three CL.DIM.SG.INDEF hill
         'three hills'

(31) a. * tsi^{55} $ti^{55}a^{11}lu^{55}$ ςey^{55}
         three CL.AUG.PL.DEF valley
         Intended: 'the three valleys'

      b. * tsi^{55} $diai^{213}a^{11}lu^{55}$ ςey^{55}
         three CL.MED.PL.INDEF valley
         Intended: 'three valleys'

The same is true for the quantifier $pi^{55}dz\underset{.}{a}u^{53}$ 'several': it can only occur with a singular indefinite classifier:

(32) a. * $pi^{55}dz\underset{.}{a}u^{53}$ $dz ai^{53}$ $t\varsigma i^{55}$
         several   CL.MED.SG.DEF road
         Intended: 'the several roads'

      b. $pi^{55}dz\underset{.}{a}u^{53}$ $dz\hbar ai^{213}$ $t\varsigma i^{55}$
         several   CL.MED.SG.INDEF road
         'several roads'

Noun phrases with a demonstrative and a Cl–N constituent, on the other hand, always take a definite classifier.

(33) a. *lu⁵⁵*   *a⁵⁵və⁵⁵ vɦai³⁵*
      CL.AUG.SG.DEF stone   DEM:MED
      'that stone (at medial distance from me)'

    b. **lu³³*   *a⁵⁵və⁵⁵ vɦai³⁵*
      CL.AUG.SG.INDEF stone   DEM:MED
      Intended: 'that stone (at medial distance from me)'

This is another example of a classifier language where the coding of definiteness on the classifier is blocked by the presence of a numeral. I now show how the facts from Weining Ahmao are problematic for the HMC account of numeral blocking, and propose a revised account which can capture all of the relevant facts.

5   Revising the HMC account

Recall from the previous discussion that we have the following facts to account for:

1. Cl–N phrases can have a definite interpretation in some languages, but #–Cl–N phrases never can;

2. Classifiers in WW can have overt definiteness morphology;

3. Classifiers in WA can have overt number and definiteness morphology;

4. Classifiers cannot take definite form when a numeral is present in WW and WA;

5. Classifiers in WA are singular in form when a numeral is present.

Let us assume that number marking is the morphological realisation of a head, Num, and that definiteness marking is the morphological realisation of a head, D. I further assume here, against the proposal in Simpson (2005), and following a number of recent proposals, that numerals merge as specifiers, not as heads (Cinque 2005, Borer 2005, Ionin and Matushansky 2006, Ouwayda 2014).[18]

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[18]The motivations for this assumption come from various facts about complex numerals, and number marking related to numerals across languages. I do not have space to go through each of the arguments here, and instead simply direct the reader to these references.

Further, I assume a standard approach to morphological word formation where syntactic operations feed morphological word formation (e.g., Travis 1984 , Baker 1988, Halle and Marantz 1993 among many others),[19] such that roll-up head movement and adjunction creates complex heads with complex morphology. Now, if we follow Simpson (2005) in assuming that definiteness is licensed in Cl–N phrases through the movement of Cl to D, then definiteness morphology on classifiers in WW, and number and definiteness marking on bare classifiers in WA means that successive cyclic head movement of Cl through Num up to D must be possible, with the complex head being realised in D.[20] This is illustrated in (34).[21]

(34)
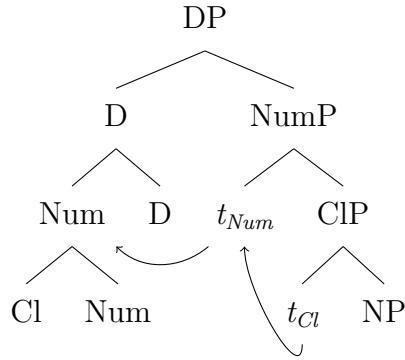
We are left with evidence in the morphology that head movement through these positions is possibleIf this is possible, but if Cl can move to Num as
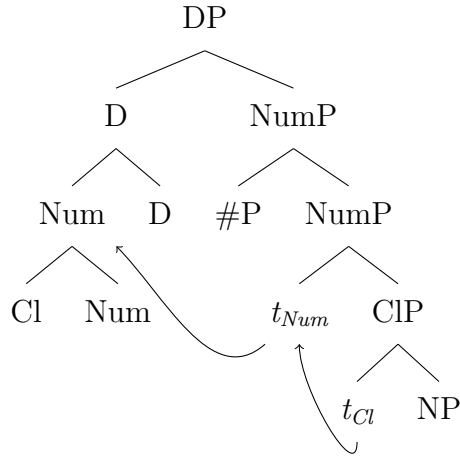
---

[19]I put aside here the fact that in recent years the status of head movement as a word formation operation has been questioned widely in the literature. See Brody (2000), Abels (2003), Matushansky (2006), Roberts (2010), Svenonius (2012), Adger (2013), Hall (2015), among others. Also see Hall (2015) for a similar argument about the HMC account of numeral blocking, but with a revised account of the facts couched in the language of Brody's Mirror Theory.

[20]An anonymous reviewer asks why it has to be Cl that moves to D, and not, say, N, as in Italian. This is a really a deep question about how to account for parametric variation, and I do not have space to go in to detail here, but for concreteness sake I am adopting the position that feature specifications on functional elements are the locus of variation. This means that there is a feature on the classifier (say, $u$def) which is a goal for Agree with [def] of D, and this Agree relation forces the subsequent head movement. N does not move because there is no feature on N which forces movement. The question then arises about Mandarin, and N-to-D movement. All I can say about this is that I do not adopt the position that definite bare nouns in Mandarin involve N-to-D movement (Cheng and Sybesma, 1999), and in fact think that this is a position which has various problems associated with it. See Hall (2015), chapter 4, for further discussion.

[21]I leave aside how the relative ordering of the morphemes (Cl, Num and D) is achieved here.

the morphology suggests, and if numerals merge in the specifier of Num, then it should also be possible to raise the complex classifier head to D. This movement past the numeral in the specifier position would not constitute a HMC violation, as there are no intervening heads in the same extended projection. This is shown in (35).[22]

(35)

```
                        DP
                  ┌──────┴──────┐
                  D            NumP
              ┌───┴───┐     ┌───┴───┐
             Num   D      #P    NumP
           ┌──┴──┐           ┌───┴───┐
          Cl    Num        t_Num    ClP
                                   ┌──┴──┐
                                  t_Cl   NP
```

As we have seen, however, this is not the case. The ability to move over the numeral should furthermore naturally extend to Cantonese, but again, it clearly does not. We know that the presence of a numeral robustly blocks a definite interpretation across all classifier languages, and also definite morphology in those languages where it exists. This means that a HMC account of the blocking effect could not be right.[23]
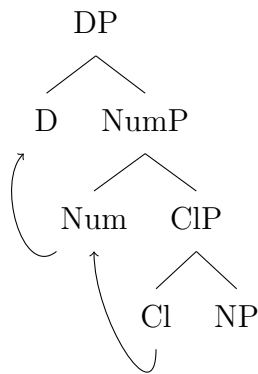
5.1 A new approach

To capture the facts, I maintain the core assumption of Simpson (2005) that it is indeed the interaction of Cl and D which gives rise to definite interpretations in Cl–N configurations, but I further propose that Cl–N phrases and

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[22]Note that, if this movement of Cl to D over the numeral were a possibility, we would also expect to see classifiers preceding numerals where the DP is definite, and following the numeral when the DP is indefinite, and this is never the case.

[23]Of course it is possible that Cantonese and WW and WA are all just different, and that the HMC account does work for Cantonese, and something else is at work in WW and WA. However we are aiming for an explanation that can cover **all** of the facts in the simplest way, avoiding language specific stipulations where possible. I show in section 5.1 that this is possible if we abandon the HMC account.

#–Cl–N phrases have different syntactic structures. In a bare Cl–N config-
uration, the full DP takes exactly the shape as that proposed by Simpson:
D takes a NumP complement which takes a ClP complement which takes
an NP complement. Definite classifiers are the result of movement of the
Cl head to D (through Num): I implement this through Agree between Def
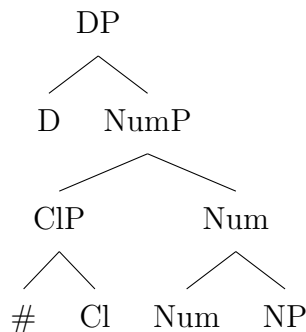features on the D and Cl heads, followed by roll-up movement (Chomsky,
1995).

(36)

```
              DP
             /  \
            D    NumP
                 /  \
               Num   ClP
                     /  \
                    Cl   NP
```

Where the def feature is not present, no movement takes place and the result
is indefiniteness.

Where my analysis parts from Simpson (2005) is in the structure of #–
Cl–N phrases. When a numeral is present, I assume that the classifier forms
a constituent with it, and this constituent merges in the specifier of Num.
I assume that the numeral is phrasal, and is either a specifier of Cl, or an
adjunct to it.

(37)

```
              DP
             /  \
            D    NumP
                 /    \
               ClP     Num
              /  \     /  \
             #    Cl  Num   NP
```

19

In this configuration, Agree between D and Cl is possible, but movement of Cl is blocked because of an independently motivated ban on Head Movement out of a specifier (see, e.g., Roberts 2010), as illustrated in (38).

(38)
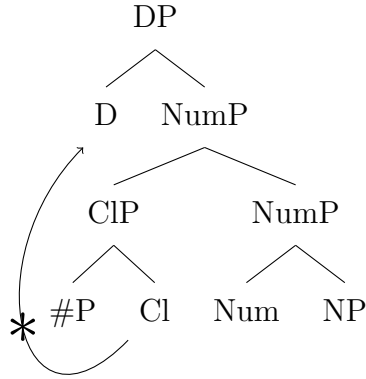
The blocking effect is therefore not a result of the HMC, and definite plural classifiers are therefore fully possible where Cl moves through Num to D, so long as a numeral is not present. A further benefit of this approach is that a ban on head movement **into** a specifier also prevents Num from moving into the ClP and being realised on Cl. This explains why the classifier appears singular with numerals in WA. The Num head has a null spell-out when it does not form a complex head with Cl, and the Cl takes a default (singular) spell-out.[24]

5.2 Summary

Again, I restate the empirical facts which were to be explained:

___

[24]Amy Rose Deal (p.c.) asks whether this blocking of definiteness by a numeral might simply be the result of the numeral always having existential force, in a similar way suggested by Cheng and Sybesma, and hence that there is no need for a syntactic explanation. A D head merged above Num would not be able to pick out a maximal individual because it would have already been bound off by the existential quantifier. I note that this could not be the case, as #–Cl–N sequences can in fact have definite interpretations associated with them with the addition of certain other elements higher in the phrase. High adjectival modifiers can give rise to definiteness (Adj–#–Cl–N sequences), as can the introduction of a demonstrative above the numeral. An anonymous reviewer also points out that the quantifier *dou* added to #–Cl–N in subject position gives rise to a definite interpretation (Cheng, 2009). This suggests that the introduction of the numeral does not semantically block the possibility of a definite interpretation. See Hall (2015), chapter 4 for discussion.

1. Cl–N phrases can have a definite interpretation in some languages, but #–Cl–N phrases never can;

2. Bare classifiers in WW have overt definiteness morphology;

3. Bare classifiers in WA have overt number and definiteness morphology;

4. Classifiers cannot take definite form when a numeral is present in WW and WA;

5. Classifiers in WA are singular in form when a numeral is present.

Each is now explained under the dual-structure account: Cl can move through Num and D creating a complex definite head with complex morphology, if the language has overt morphological content associated with these heads. The #–Cl–N structure containing # and Cl as a constituent means that Cl can't move to D, following a ban on head movement out of a specifier, which blocks a definite interpretation. Num can't move to Cl, following a ban on head movement into a specifier, which blocks plural morphology. Each follows from the dual structure proposed, and appealing to these two structures means that the apparent gaps left by the HMC approach are filled.
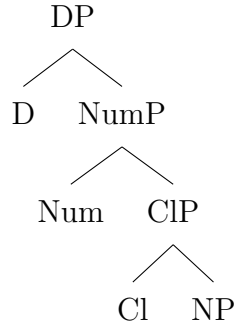
The two distinct structures for Cl–N and #-Cl–N are repeated here.[25]

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[25]An anonymous reviewer suggests that we might expect there to be further syntactic evidence that the structures are different in these cases. Currently I have not been able to identify any very clear differences aside from those already outlined at the beginning of the paper (i.e., that #–Cl–N phrases and Cl–N phrases have a different distribution with respect to availability in subject/topic and object position). One hint at another potential difference comes from another comment by the same reviewer. Li (2011) points out that for some MC speakers, it is possible to get an adjective to intervene between a numeral and a classifier, in a very restricted set of cases:
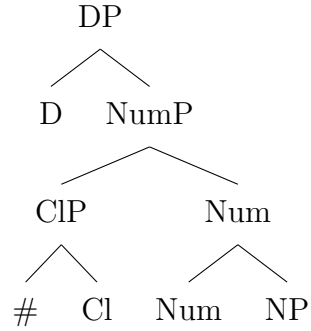
(39) *tou   shang dai   le   liang da   duo hua.*
      head on   wear PERF   two   big   CL   flower

'(She) wore two big flowers on her head.'

For the two speakers that I could get to accept the above example as possible, neither could do the same with a bare Cl–N sequence *da duo hua*. This is potentially another syntactic difference: an adjective can merge in between the numeral and classifier in the structure in (41), but it cannot appear in the bare Cl–N structure in (40). I accept that this is not knock-down evidence of a major syntactic difference, but is at least suggestive. I leave an investigation of further differences between the two to future research.

(40) Cl–N

```
        DP
       /  \
      D   NumP
          /  \
        Num  ClP
             /  \
            Cl   NP
```

(41) #–Cl–N

```
        DP
       /  \
      D   NumP
          /  \
        ClP   Num
        / \   /  \
       #  Cl Num  NP
```

A consequence of this analysis is that numerals form a constituent with the classifier to the exclusion of the noun in classifier languages, when a numeral is present. This could be seen as a counter-intuitive proposal, and in order to fully motivate this approach it is necessary to provide some motivation for the existence of the two structures beyond just the facts discussed above. In the next section I offer some independent support for the proposed #+Cl constituency.

6 Classifier and Numeral Constituency

There is some debate in the literature on classifiers over whether the classifier and numeral form a constituent, and whether this is consistent across all classifier languages. The variety of positions can be summarized as follows:

(42) a. Classifier and numeral are a complex head (Kawashima 1998);

    b. Classifier is a head in the extended nominal projection (xNP), Numeral is a specifier of Cl (Tang 1990, or Cl is Num, numeral is specifier: Watanabe 2006);

    c. Classifier is a head in the xNP, Numeral is a head of NumeP (Cheng and Sybesma 1999, Simpson 2005);

    d. Classifier is a head in the xNP, Numeral is a specifier of #P (Borer 2005, Ouwayda 2014);

    e. Classifier and Numeral form a constituent (Fukui and Sakai 2000, also Ionin and Matushansky 2006);

    f. Different classifier languages have different structures depending on whether the classifier appears independently (Saito et al. 2008, Jenks 2010, Hall 2015).

Most arguments in favour of a complement relation existing between the classifier and the noun attempt to show that the classifier behaves as a functional head, and therefore that it cannot be part of a single functional unit with the numeral. This does not, however, suggest that the two cannot be a constituent. The only clear argument claiming that the two could not be a constituent, at least in MC, is proposed by Saito et al. (2008). They show that the numeral and classifier can float to the left in Japanese, stranding the noun (43), but that the same does not hold in MC (44).

(43) a. *Taroo-wa san-satu no hon-o   katta*
          Taro-TOP   three-CL *no* book-ACC bought
          'Taro bought three books.'

      b. *San-satu, Taroo-wa hon-o   katta*
          three-CL   Taro-TOP   book-ACC bought

(44) a. *Zhangsan mai-le   san-ben   shu*
          Zhangsan buy-PERF three-CL book
          'Zhangsan bought three books.'

      b. ***San-ben, Zhangsan mai-le   shu*
          three-CL Zhangsan buy-PERF book

They posit an adjunction structure for the numeral and classifier in Japanese, where they form a constituent. For MC they suggest that the classifier is a functional head which takes an NP complement, and which projects a numeral in its specifier. This represents the conclusion that the lack of availability of movement of the numeral and classifier in MC means that the numeral and classifier are not a constituent. This is not a particularly strong argument, however, as the lack of movement could just be an independent fact about the language, and this is not ruled out as a possibility in their paper. I therefore continue in the assumption that my proposal is not directly falsified by the Q-Float facts.

Given the controversy and diverse opinions related to the constituency of the numeral, classifier, and noun, it is necessary to provide some further motivating evidence for the constituency that I propose above. Therefore, in this section, I present some supporting evidence for the claim that the numeral and classifier form a constituent to the exclusion of the noun. First, I briefly argue against the claim that there is a strong selectional relation between the classifier and the noun, and also show that some cross-linguistic evidence supports a view where the classifier and the numeral have a closer

relation than the classifier and noun (when both are present). I then move on to my main typological evidence that the numeral and classifier form a constituent to the exclusion of the noun, which involves an argument from word order: if numeral and classifier did not form a separate constituent from the noun then we would expect much more variation in word order within the noun phrase in classifier languages than we actually see.

6.1   Close relationship between classifier and noun

The main observation that I want to take into consideration here is that there appears to be something like a selectional or agreement relation between the classifier and the noun, as the following examples illustrate.

(45)   *gen*: classifier for thin, slender objects

    a. *yi-gen   xiangjiao*
        one-CL banana
        'One banana'

    b. * *yi-gen   gou*
        one-CL dog
        Intended: 'one dog'

(46)   *zhi*: classifier for (certain) animals

    a. * *yi-zhi   xiangjiao*
        one-CL banana
        Intended: 'one banana'

    b. *yi-zhi   gou*
        one-CL dog
        'One dog'

In (45), the classifier *gen* can only cooccur with a certain set of objects (namely those which are thin and long), and there is something of a clash when the classifier appears with a noun from outside of that class (such as 'dog'). 'Dog' has to appear with a different classifier, *zhi*, as illustrated in (46) An anonymous reviewer questions how such a relationship between a classifier and a noun can possibly be set up in a structure such as that proposed in (41). To this I have two answers. First, I do not think that this "agreement" relationship necessarily has to do with Agree or selection or some such purely syntactic relation between two heads. Rather, I think

that the relationship is semantic, and results from the lexical entries for
the classifiers. One illustration of this comes from an effect seen with some
speakers where nouns can be coerced into the appropriate group under some
circumstances. Two informants fully accept (46a), under a special kind of
interpretation where the banana is assumed to be particularly cute (and
possibly have pet like characteristics). I assume here that this means that
perhaps the example should not be marked as ungrammatical, but instead as
having a strong semantic implausibility associated with it. Further, it seems
possible that classifiers are able to shift noun interpretation. Some nouns can
appear with various different classifiers, but with different interpretations.

(47)   a.   *yi-bu*   *dianhua*
            one-CL telephone

            'One telephone'

       b.   *yi-tong* *dianhua*
            one-CL telephone

            'One phone call'

(48)   a.   *san-zhi*   *hua*
            three-CL flower

            'Three flowers' (long on their stalks)

       b.   *san-duo* *hua*
            three-CL flower

            'Three flowers' (round, with a foucs on floweryness)

I take this to mean that the noun denotes a nebulous property which includes
each of the different possible interpretations included in the above examples
('telephone' includes telephone objects as well as calls), and then the seman-
tics of the classifier includes a presupposition that the object being counted
is one of a particular set.

6.1.1   Classifiers in Mi'gmaq and Chol

Some separate supporting evidence that the numeral and classifier are more
closely associated comes from Bale and Coon (2014).[26] They note that
Mi'gmaq and Chol both have a surprising distribution of classifiers if it's

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[26]The idea that classifiers are 'for' numerals, as far as the semantics is concerned, goes
back to Krifka (1995).

assumed that the classifier is semantically more closely related to the noun than the numeral. The facts are as follows.

In Mi'gmaq, the numerals 1-5 cannot appear with classifiers, but 6 and higher must.

(49) a.
     i.   *na'n-ijig ji'nm-ug*
        five-AGR man-PL
     ii. **na'n te's-ijig ji'nm-ug*
        five   CL-AGR man-PL
        'five men'

    b.
     i. **asugom-ijig ji'nm-ug*
        six-AGR   man-PL
     ii. *asugom te's–ijig ji'nm-ug*
        six   CL-AGR man-PL
        'six men'

In Chol, there is a vestigal Mayan base 20 number system: speakers only use Mayan numerals for 1-6, 10, 20, 40, 60 ..., and otherwise, they use Spanish loan numerals. What is important is that classifiers obligatorily appear with Mayan numerals (50), but are obligatorily absent with Spanish numerals (51):

(50) a. *ux-p'ej   tyumuty*   (51) a. **Nuebe-p'ej tyumuty*
       three-CL egg   nine-CL   egg

       b. **ux   tyumuty*   b. *Nuebe tyumuty*
         three egg   nine   egg
         'Three eggs'   'Nine eggs'

Note that this is true no matter what noun we use (including Spanish loan nouns), and no matter what classifier the numeral combines with.

Under an account where the numeral and classifier have a closer relationship, these facts immediately make sense. Under a Chierchian account where the classifier acts as an individualizer that "portions out" chunks of the mass that nouns denote Chierchia (1998a), the idiosyncratic behaviour of the numerals receives no explanation. This provides evidence that composition of the classifier and the numeral is required for the numeral to then be able to compose with the noun: this would make sense if # and Cl form a constituent to the exclusion of the noun.

Of course Mi'gmaq and Chol are not related to the languages under discussion in any way, but, on the assumption that there is some shared syntactic category of classifier in the DP of all of these languages, I take this to at least be suggested evidence that there is a closer relation between the classifier and the numeral than the classifier and the noun.

In the next subsection I move on to some typological evidence for this close relation between numeral and classifier.

6.2 Typology

So far we have been focusing on languages where the numeral precedes the classifier, and the classifier precedes the noun, giving the overall order in (52), illustrated with examples in (53) and (54).

(52) $\# \succ Cl \succ N$

(53)   *liang gen   xiangjiao*
       two $CL_{thin/pole}$ banana
       'two bananas'
                  (MC: $\#{\succ}Cl{\succ}N$)

(54)   *ib-tus   tub.txib*
       one-$CL_{person/animal}$ messenger
       'one messenger'
                  (Hmong: $\#{\succ}Cl{\succ}N$)

Unsurprisingly, we see crosslinguistic variation in the ordering of these elements, and there are languages where the numeral and classifier follow the noun (55, 56).

(55)   *hon   san-satsu*
       book three-$CL_{bound/printed}$
       'three books'
                  (Japanese: $N{\succ}\#{\succ}Cl$)

(56)   *phya tə   Chaʔ*
       mat   one $CL_{flat/thin}$
       'one mat'
                  (Burmese: $N{\succ}\#{\succ}Cl$)

When we look at a full typology of classifier languages, however, it becomes clear that the order of the numeral, classifier and noun is quite constrained. In Hall (2015) I discuss three word order surveys, which produce the following word order typology for classifier languages:

(57)   Order of numeral, classifier and noun (following Jones 1970, Greenberg 1972, Aikhenvald 2000):

a. $\# \succ$ Cl $\succ$ N: very common (MC, Vietnamese, Cantonese, ...)

b. N $\succ \# \succ$ Cl: very common (Thai, Khmer, Loniu, ...)

c. Cl $\succ \# \succ$ N: very rare (Ibibio only)

d. N $\succ$ Cl $\succ \#$: very rare/maybe no languages (possibly Bodo only)

e. Cl $\succ$ N $\succ \#$: very rare (Ejagham only)

f. $\# \succ$ N $\succ$ Cl: Not attested

A closer look at the two extremely rare cases, i.e., Ibibio (Cl$\succ$#$\succ$N) and Ejagham (Cl$\succ$N$\succ$#) shows that they should in fact be removed from the typology. Ibibio doesn't have classifiers at all (Essien, 1990). Ejagham does not have obligatory classifiers, and examples involving classifier-like elements discussed in Greenberg (1972) look more like a measure phrase (see Watters 1981, and Hall 2015 for discussion). If we remove these languages, then we have the following typology:[27]

(58) a. $\# \succ$ Cl $\succ$ N: very common (MC, Vietnamese, Cantonese, ...)

b. N $\succ \# \succ$ Cl: very common (Thai, Burmese, Khmer, Loniu, ...)

c. Cl $\succ \# \succ$ N: Not attested

d. N $\succ$ Cl $\succ \#$: rare (a few Bodo-Garo, Tani and Chin languages)

e. Cl $\succ$ N $\succ \#$: Not attested

f. $\# \succ$ N $\succ$ Cl: Not attested

What is striking in this typology is that there are no attested orders where

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[27]I have also included some additional N $\succ$ Cl $\succ \#$ languages (Tani and Chin languages) which are not included in the typological studies referenced above.

the numeral and the classifier are separated by the noun.[28,29] It is clear that this is completely expected if the numeral and the classifier form a constituent to the exclusion of the noun, but remains mysterious if we posit the kind of structure proposed by Simpson (2005). In the next subsection I will explicitly show why.

6.3 Deriving word order variation

Recent work on cross-linguistic variation in the relative order of DP internal elements has suggested that we can make sense of gaps in the typology in systematic ways, under certain assumptions about the nature of DP internal roll-up movements (Cinque 1996, 2005), or with a flexible approach to the linearization of the unordered sets produced by Merge (Abels and Neeleman 2012). I give a brief summary here of the two related approaches, and then show what predictions they would produce with respect to word order variation in classifier language, on the assumption that the classifier takes a NP complement.

6.3.1 Cinque 2005: Universal 20

Cinque (2005) shows that each of the 14 attested orders of Demonstrative, Numeral, Adjective and Noun can be generated, while ruling out each of the 10 unattested orders, if the following constraints on movement operations are applied:

[28]For completeness sake, I give a full list of all attested word orders in classifier languages in (59).

(59)   All DP internal elements

	Word order	Example Languages
1.	Num≻Cl≻N≻A≻Dem	Vietnamese, Nung, Malay
2.	N≻A≻Num≻Cl≻Dem	Thai, Khmer, Javanese
3.	Dem≻N≻A≻Num≻Cl	Burmese, Maru
4.	Dem≻Num≻Cl≻A≻N	MC, Cantonese
5.	Dem≻Num≻Cl≻N≻A	Yao
6.	Num≻Cl≻A≻N≻Dem	Coast Tsimshian
7.	Dem≻A≻N≻Num≻Cl	Newari, Dulong
8.	N≻A≻Dem≻Num≻Cl	Nuosu Yi, Lahu, Akha
9.	Dem≻N≻Adj≻Cl≻Num	Kokborok, Apatani, Mizo
10.	Dem≻Adj≻N≻Cl≻Num	Mising, perhaps Nishi

Note that the 'example languages' column is not intended as an exhaustive list of all of the languages that exhibit that order.

[29]See Hall (2015), chapter 5 (especially 5.4.1) for an explanation of the absence of the Cl ≻ # ≻ N order.

(60) a. Merge order: [. . . [$_{WP}$ Dem . . . [$_{XP}$ Num . . . [$_{YP}$ A [$_{NP}$ N]]]]]

b. Parameters of movement
   i. No movement, or
   ii. Movement of NP plus pied-piping of the *whose picture* type (movement of [NP[XP]]), or
   iii. Movement of NP without pied-piping, or
   iv. Movement of NP plus pied-piping of the *picture of who* type (movement of [XP[NP]]).
   v. *Total* versus *partial* movement of the NP with or without pied-piping (either NP moves all the way up or only partially)
   vi. Neither head movement nor movement of a phrase not containing the (overt) NP is possible.

The first assumption of a fixed universal hierarchical order of elements in the DP gives us the following underlying structure:

(61)
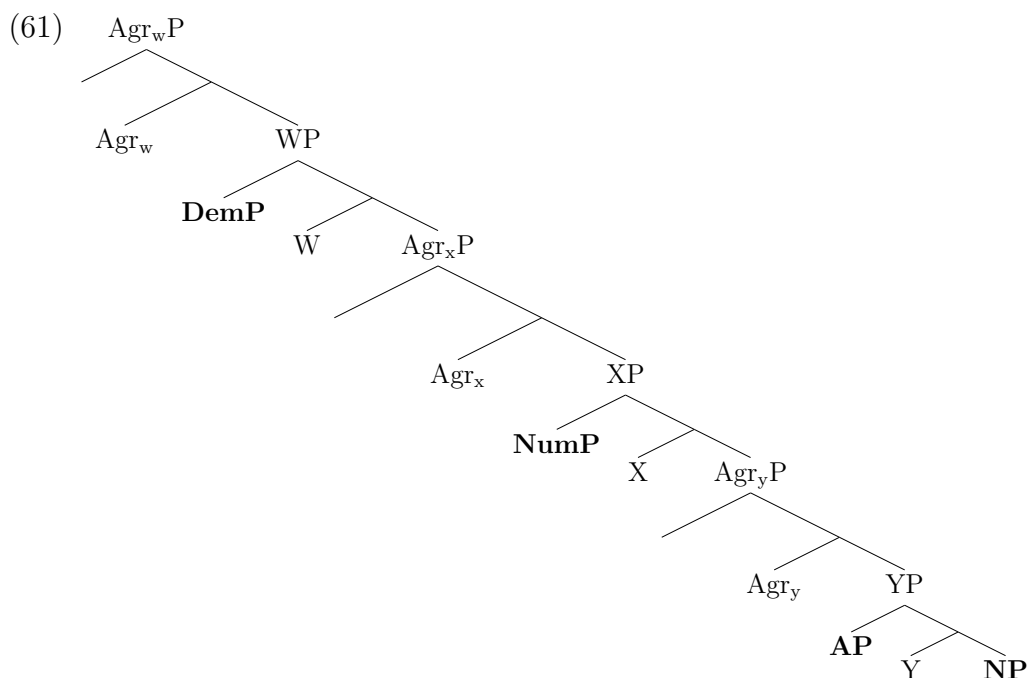
Cinque assumes that modifiers are merged in the specifiers of functional heads in the xNP, and that antisymmetry (i.e., the LCA of Kayne 1994) rules out symmetric base generation of modifiers, meaning that all post-nominal modifiers must be generated through movement of the NP, or some constituent containing the NP. Each of the elements demonstrative, numeral and adjective are taken to be phrasal elements which merge in the specifier

of a functional head. In each case of movement, the NP, or pied-piped constituent containing the NP, moves to the specifier of an Agr head above the contentful phrasal element. The noun phrase can move to any of the Spec Agr positions (60biii), and can pied-pipe any constituent either in the form [NP[XP]] (60bii) or [XP[NP]] (60biv). This movement can be partial (to one of the intermediate Agr positions), or complete (all the way to the highest Agr projection). Through a combination of movement steps, which must follow the constraints in (60), each of the attested orders can be derived.

6.3.2 Abels and Neeleman 2012

Abels and Neeleman (2012) (henceforth A&N) argue that all of the orders that are generated by Cinque's approach can in fact be produced without some of the assumptions that Cinque makes about phrase structure and movement. They show that a more constrained theory of movement, coupled with flexibility in the linearization of sister nodes (eschewing the LCA) generates the same results.

(62) a. The underlying hierarchy is Dem > Num > A > N (where > indicates C-command);

b. there is cross-linguistic variation wrt the linearization of sister nodes in this structure;

c. all (relevant) movements move a subtree containing N;

d. all movements target a c-commanding position;

e. all movements are to the left.

The idea is that, with the underlying structure shown in (63), 8 different word orders can be generated if we assume that linearization of sisters is flexible.

(63)
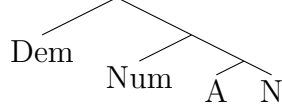
(64) Base generated orders

   a. Dem Num A N

   b. N A Num Dem

   c. Dem Num N A

   d. A N Num Dem

   e. Dem A N Num

   f. Num N A Dem

   g. Dem N A Num

   h. Num A N Dem

The remaining 6 orders are generated through movement constrained in the ways noted in 62). Simply put, this approach produces the same results, but appeals to flexibile linearization of sisters instead of massive roll-up movement.
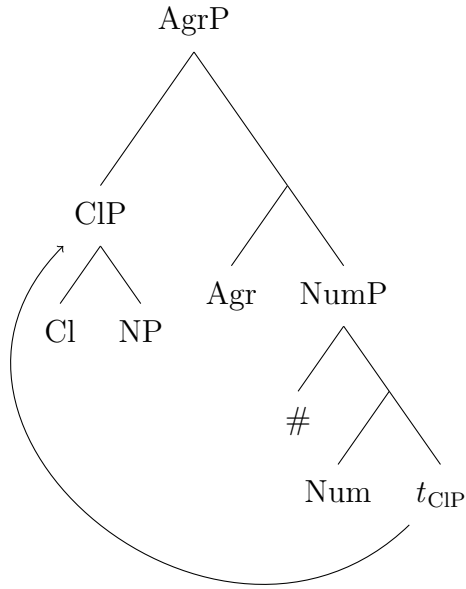
6.3.3 Predictions

For our purposes, either approach to crosslinguistic variation in word order will do, and I remain agnostic as to which is the preferred approach. Here we are trying to account for the gaps in classifier language word order typology: in particular, why the classifier and the numeral are never separated by the noun. Whether we take a roll-up movement approach following Cinque, or a flexible linearisation approach following Abels and Neeleman, we would expect the noun to be able to appear between the numeral and the classifier under any analysis of DP internal structure which takes the classifier to be a head taking the noun as a complement, and which takes the numeral to appear in a specifier or adjunct position above the classifier (i.e., 42b,c above). If the numeral is merged in the specifier of Num, then, under the roll-up movement approach, both $Cl \succ N \succ \#$ (65) and $\# \succ N \succ Cl$ (66) can be generated.[30],[31]
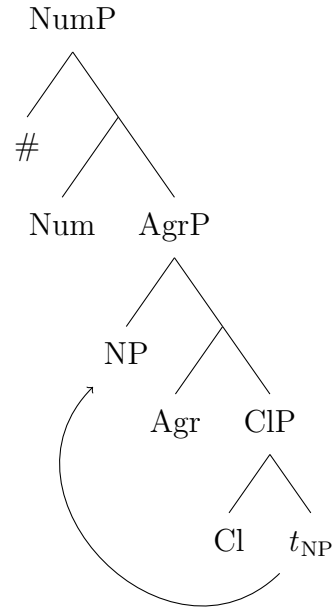
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[30] I follow Cinque (2005) in having the specifier of an Agr head as a landing site, but have left out irrelevant Arg positions (i.e., Agr positions which are not the landing site of movement).

[31] A reviewer points out that different assumptions about the numeral (it heads its own projection vs it is in a specifier of another head) would lead to different predictions about what word orders are possible. This is true, but under all approaches (except for where the numeral and classifier go together as a separate constituent) we still expect the numeral
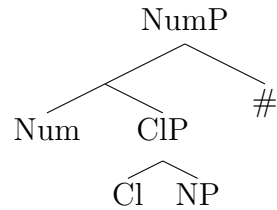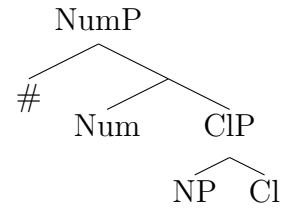
(65)

```
                AgrP
               /    \
             ClP      \
            /  \        \
          Cl    NP    Agr   NumP
                            /    \
                           #      \
                              Num   t_ClP
```

(66)

```
            NumP
           /    \
          #      \
            Num    AgrP
                  /    \
                NP      \
                    Agr   ClP
                         /   \
                       Cl     t_NP
```

Under the flexible linearization approach too, both Cl $\succ$ N $\succ$ # (67) and # $\succ$ N $\succ$ Cl (68) can be generated:

(67)

```
         NumP
        /    \
      /       #
   Num   ClP
        /  \
      Cl    NP
```

(68)

```
       NumP
      /    \
     #      \
        Num   ClP
             /   \
           NP     Cl
```

If, on the other hand, the numeral and classifier form a constituent to the exclusion of the noun, as I have proposed, then we predict that the numeral and classifier should not be separated by the noun, and get the typological result for free. This is not a knockdown argument against an alternative, but it is something that would require explanation if we accept that the classifier takes N as its complement, and requires no explanation at all if Cl and # form a constituent.

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and classifier to be separable, with the noun intervening.

7   Conclusion

In this paper I have argued that a traditional account of the "numeral blocking" effect in classifier languages, which appeals to the Head Movement Constraint, should be revised in light of new empirical evidence from classifier languages with overt number and definiteness morphology on the classifier. I have suggested that a revised account, which can capture all of the empirical facts, leads us to the conclusion that there must be two separate syntactic structures for #–Cl–N phrases and Cl–N phrases in these languages, and that when a numeral is present, the numeral and the classifier form a constituent to the exclusion of the noun. This conclusion is supported by typological evidence: there are no languages attested which exhibit a DP internal word order where the classifier and the numeral are separated by the noun, which would be mysterious under standard approaches to cross-linguistic word order variation in the DP, but which falls out naturally under the account proposed here.

Abbreviations

Dem, demonstrative; A, adjective; N, noun; Cl, classifier; Num, number; #, numeral; PL, plural; SG, singular; Def/DEF, definite; AGR, agreement morpheme; DIM, diminutive; MED, medial; AUG, augmentative; PRF, perfective.

Acknowledgements

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