LICENSING DEFINITENESS: A SPANNING ACCOUNT OF NOUN PHRASE INTERPRETATION IN MANDARIN CHINESE AND CANTONESE*

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Abstract

In this paper I provide a novel account of a number of facts related to restrictions on the interpretation of Mandarin Chinese and Cantonese noun phrases that have been discussed extensively in the literature. The approach that I take eschews a more standard head-movement approach, and implements a 'spanning' account, in which multiple heads in an extended projection can be spelled out as a single morpheme. I show that a spanning account of the interpretation of different noun phrase configurations in conjunction with a condition on the licensing of a definite D head in the extended nominal projection captures all of the facts, and is also compatible with data from a classifier language, Nuosu Yi, which exhibits definite bare nouns and also a definite determiner.

1. Introduction and proposal

I present here an analysis of constraints on noun phrase interpretation in Mandarin Chinese (MC) and Cantonese making use of an approach to the syntax-morphology interface which relies on the notion of morphological 'spans': sequences of heads in an extended projection that can be the target for insertion of a single morpheme (Abels & Muriungi 2007, Svenonius 2012, Adger 2013, a.o.). I show that such an approach leads to a parsimonious account of the facts, and also gives us an explanation for an interesting quirk of the languages, whereby adjectives in a high structural position in the DP force a definite interpretation. I also show that the spanning story allows us to avoid a word order problem which is faced by a standard head-movement account.

The presentation is structured as follows: in section 2 I present noun phrase interpretation facts in MC, focusing on the special case of modifier position in subsection 2.1. In section 3 I propose an account of those facts based on the idea of morphological spans, and expand my discussion to Cantonese, showing how the account can capture the data there too. In section 4 I briefly give an alternative head-movement account, and show that there is one case in particular where that account gets the facts wrong. In section 5 I discuss some cross-linguistic implications of the system that I set up, before concluding in section 6.

2. Noun phrase interpretation in Mandarin Chinese

The availability of a definite or indefinite reading for a noun phrase in MC depends on a number of factors, including syntactic position and also the configuration of elements internal to the noun phrase. Bare nouns in object position can be definite or indefinite, and are

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number neutral. Classifier-Noun (Cl-N) sequences are obligatorily singular, and are unambiguously indefinite. Numeral-Cl-N sequences are unambiguously indefinite, and are singular or plural depending on the numeral (singular if it is *yi* 'one', plural otherwise). See Cheng & Sybesma (1999, 2005) for an in depth discussion of these facts.[1]

The preverbal subject position is restricted to definite noun phrases (Huang, Li & Li 2009, a.o.), and so Cl-N and Numeral-Cl-N sequences are degraded in this position (1). Bare nouns are acceptable, as are noun phrases with a demonstrative, which must have a definite interpretation in this position (2).[2]

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

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

(2) a. *gou   chi-le dangao*
       dog   eat-LE cake
       'The dog ate the cake'

   b. *nei-zhi gou   chi-le dangao*
       that-CL dog   eat-LE cake
       'That dog ate the cake'

In table 1 I summarize the distributional facts.

Table 1: Noun phrase interpretation in MC

Noun Phrase Config	Definite	Indefinite	Number
N	Yes	Yes	Neutral
Cl-N	No	Yes	Singular
Num-Cl-N	No	Yes	Singular/plural

2.1. Modifier position and interpretation

Phrasal adjectives canonically appear immediately pre-nominally, accompanied by the general modifier marker *de*.[3] Modified bare nouns maintain their ambiguity with respect to

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[1] I do not discuss the availability of a generic interpretation for bare nouns here, but recognise that any theory of the interaction between syntax and interpretation in the noun phrase must be able to account for generic readings as well as definite/indefinite contrasts. This I leave for future research.

[2] I gloss *le* simply as LE, not wanting to commit to any specific analysis of its function, which has been widely debated in the literature. It has been analysed as a perfective aspect marker (Huang et al 2009), and as a resultative predicate (Sybesma 1997).

[3] I leave aside here discussion of bare modifiers which do not occur with *de*, as their distribution is far more restricted, and their behaviour is somewhat idiosyncratic and subject to interspeaker variability. See Yang (2005), chapter 6, for in depth discussion of the differences between the two types of modifier. I also put aside discussion of the exact function of *de*, as nothing I say hinges on this. I therefore gloss *de* simply as DE.

definiteness. When a numeral and classifier are present, the unmarked order of elements is Numeral > Cl > Adj > N, and the phrase is unambiguously indefinite. Adjectives can also appear in a marked pre-numeral position:

(3) a. *san-zhi   huangse-de   gou*   (unmarked pre-nominal position)
      Three-CL   yellow-DE   dog

   b. *huangse-de   san-zhi   gou*   (marked pre-numeral position)
      yellow-DE   three-CL   dog
      'three yellow dogs'

The characteristics of noun phrases which have a marked pre-numeral adjective have been discussed in quite some detail in the literature. I summarise the properties of these 'high modifiers nominals' (HMNs, nominals with the order Adj-Numeral-Cl-N) in (4).[4]

(4) a. *HMN in postverbal subject position (Zhang 2015);
   b. *HMN in *you* existentials (Huang 1982, Lu 1998);
   c. *HMN after non-referential *ta* (Lin & Zhang 2006);
   d. HMN acceptable in pre-verbal subject position (my informants);
   e. *Extraction of N from HMN (Zhang 2015);
   f. HMN exhibits forced 'wide-scope' reading with respect to quantifiers (my informants);
   g. HMN exhibits uniqueness/inclusiveness presupposition (my informants).

Characteristics (a) to (d) show that HMNs pattern with definite and strongly quantified noun phrases. Characteristic (e) shows that HMNs exhibit the kind of resistance to N extraction that definite DPs have been argued to exhibit (Diesing 1992). Property (f) shows that HMNs do not behave like indefinites in MC with respect to their scope relative to other quantificational elements (see Huang 1982), and (g) shows that they exhibit the same kind of uniqueness/inclusiveness presupposition that definite descriptions do (see, e.g., Lyons 1999, Elbourne 2012). Each of these properties is the opposite of what holds for low modifier nominal (LMNs), which are obligatorily interpreted as being indefinite. In table 2 I summarize the interpretational facts related to modified noun phrases:

Table 2: Noun phrase interpretation in MC (with modifiers)

Noun phrase config	Definite	Indefinite
Adj -N	Yes	Yes
Cl-Adj-N	No	Yes
Numeral-Cl-Adj-N (LMN)	No	Yes
Adj-Numeral-Cl-N (HMN)	Yes	No

These facts are intended to highlight a significant contrast in MC noun phrase interpretation: Numeral-Cl-N sequences are obligatorily indefinite, and remain so when a modifier is introduced in the canonical low position, but HMNs are obligatorily definite. In the remainder of this paper, I will argue that these facts, along with a cross-linguistic

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[4] My informants all self-identify as native speakers of Mandarin. They are all in roughly the same age group (mid-twenties).

generalization relating to definiteness and noun phrase configuration, can be understood to follow from the interaction of a constraint on the licensing of a definite D head with the way that the syntax interfaces with morphology through spell-out. I also show that the position of the adjective relative to a definite bare noun cannot be explained through a head movement analysis of the facts, but that an account which utilizes the notion of morphological spans is able to capture the data.

3. A 'spanning' account

Jenks (2012) identifies and discusses a crosslinguistic generalization that holds across a number of classifier languages which allow bare nouns in argument position. The generalization takes the form of two one-way entailments: (i) if a classifier language has bare nouns which can be interpreted as definite, then Cl-N phrases will be unambiguously indefinite; (ii) if a classifier language has Cl-N phrases which can be interpreted as definite, then bare nouns will be unambiguously indefinite. This is summarized in (5):

(5) a. Bare N [±def] → Cl-N [-- def]   (Type A language)
     b. Cl-N [±def] → Bare N [-- def]   (Type B language)

The generalization holds across a number of Sino-Tibetan and Austroasiatic classifier languages including Hmong, Cantonese, Mandarin, Min, Wu[5], and Vietnamese.

Jenks proposes that this pattern can be understood as resulting from a parametric difference in the way that parts of the functional structure of the DP spell out in the two different language types. The proposal relies on the notion of morphological SPAN, where more than one head in an extended projection can be spelled out as a single morphological unit (see Abels & Muriungi 2003, Svenonius 2012, a.o.). To summarize, Jenks proposes that Type A languages (such as Mandarin) have a span over $[D_{[def]} [Cl [N]]]$ which spells out as a noun (giving a definite interpretation for bare nouns), and Type B languages (such as Cantonese) have a span over $[D_{[def]} [Cl]]$ which spells out as a classifier (giving a definite interpretation for Cl-N sequences). Type A languages do not have the span available in Type B languages, and vice versa. This means that there is no way for a definite D head to spell out as part of a classifier in a language like Mandarin, and there is no way for a definite D head to spell out as part of a bare noun in a language like Cantonese.

In the next subsection I give a brief explanation of how spanning works, and then show how we can expand on Jenks's insight to account for the entire range of interpretations available in Mandarin and Cantonese.

3.1. Spelling out Spans

I adopt the assumptions in (6) about the syntax-morphology interface, which constitute a spell-out system which follows Williams (2003) and Adger (2013), and which is similar in principle to Svenonius (2012):[6,7]

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[5] Cl-N can give rise to a definite interpretation in Wu only where there is a change in tone on the classifier. See Cheng & Sybesma (2005) for discussion.

[6] See also Dékány (2011) for a related system.

[7] The assumption (6d) is a potential locus of parametric variation; thus it would be more accurate to state that this is universal spell-out system with an additional language specific parameter setting.

(6) a. A single morpheme can spell out more than one head in a (continuous) extended projection line of heads; i.e., spell-out targets spans.

  b. All heads must spell out as part of a span (possibly as a trivial, one head span), or have an overt specifier.

  c. Specifiers spell out to the left of heads.

  d. Spans are ordered by their relative height ('higher than' = 'left of').

In what follows, all trees are given as 'telescoped' representations, in the sense of Brody (2000), as such representations make complement lines clearly visible. Categories in the projection line stand for both a head and its phrasal projection, with specifiers being leftward branches coming off of those heads. An illustration of the system of spell-out that I adopt is given in (7). Spans are shown through shading, and wiggly lines represent the spell-out of those spans:

(7)

Overall ordering: Spec $> \alpha > \beta$
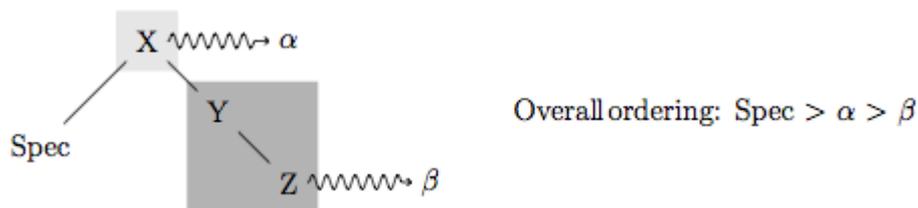
Here a span from Z to Y is spelled out as a single morpheme β (6a). This morpheme is spelled out low, in the position of Z. The (trivial) span over X is spelled out as the morpheme α. α and β are ordered by assumption (6d), which says that the higher span spells out to the left of the lower span, giving $\alpha > \beta$. 'Spec' is spelled out to the left of the span over X (6c), giving Spec $> \alpha$. Thus the total ordering is Spec $> \alpha > \beta$. I am using Spec as a place holder for some other potentially complex unit; whatever its internal composition, it will appear preceding α in the example in (7). If the element labelled 'Spec' was instead a specifier of Y, then the ordering would be $\alpha >$ Spec $> \beta$.

3.2. The syntax and semantics of the extended nominal projection

I make some specific assumptions about the syntax of nominals here, and about the semantic contribution of the different heads in the extended nominal projection (extended projection in the sense of Grimshaw 2005).[8] The semantic function of Cl is to impose a join complete semi-lattice structure over the property that the noun denotes, identifying atoms and sets of those atoms which have the property P. The nature of the semi-lattice means that both atoms and pluralities are included: the structure produced through the merger of Cl is interpreted as number neutral. The Num head introduces a variable over that structure, and imposes further restrictions on the lattice through the bivalent feature [±atomic].[9] [+atomic] identifies only the atoms in the semi-lattice, excluding non-atoms, and [–atomic] identifies all of the non-atoms, excluding the atoms. This gives us the singular/plural distinction. For

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[8] See Borer (2005, 2013) and Adger (2013) for more recent thorough explorations of the idea of extended projections.
[9] The feature [±atomic] adopted here is taken from Harbour (2014).

example, the structure [Num$_{[-\text{atomic}]}$ [Cl [N]]] would give us all of the non-atomic sets of things with the property given by N. A numeral is introduced in the specifier of a functional head Q. If there is a mismatch between the feature on Num and the value given by the numeral, then the result is semantically incoherent (although I assume that the syntax is able to build such a structure).

I assume that an overt classifier signals the projection of a Num head in MC, and that the default feature value on Num is [+atomic], as Cl-N sequences are obligatorily singular. In the case of bare nouns, a Num head is projected but with no feature specifying atomicity (or lack thereof); in this case Num's only job is to introduce a variable over the structure, and we get a number neutral interpretation (which includes the whole semi-lattice, namely all of the atoms and sets of atoms). I do include a Cl head in the extended projection of even a bare noun, as it has semantic content (i.e., bare nouns can be count and denote atoms and sets composed of those atoms).

The variable introduced by Num can be existentially closed at the VP level (Heim 1984, Diesing 1992, a.o.), or can be bound by an iota operator in the D head, which is the topic of the next subsection.[10]

3.3. Licensing definiteness

I take D to be the locus of definiteness; D introduces the iota operator which binds the variable introduced by Num. Where D merges, the noun phrase is interpreted as definite, but only if the structure meets a licensing condition on definiteness.[11] The disjunctive licensing condition on a D head, which I take to hold cross-linguistically, is as follows:[12]

(8) A D head is licensed iff either
    a. the head is spelled out as part of a span with other heads, or
    b. the head is spelled out itself (a trivial span), as a definite article, or
    c. a phonologically overt element merges in the specifier of D.

The intuition behind this condition is that there has to be some kind of morphological 'flagging' of the D position for it to be interpreted. The way that I have worded the proposal above is potentially misleading: it appears that I am positing a morpho-phonological licensing condition on the syntactic structure, which would seem not to be in the spirit of the Y-model (and associated models) of the architecture of the grammar, in which phonological and interpretative processes are post-syntactic, and on separate branches which do not interact.
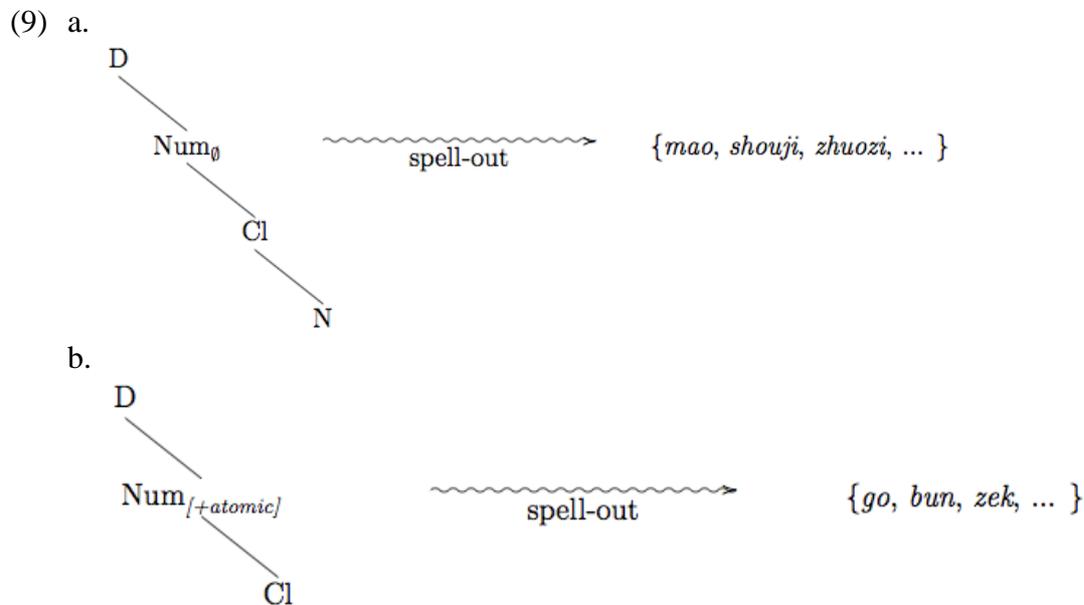
However, the proposal is instead that there are restrictions on what phonological outputs a speaker has available to her; a speaker has a list of learned phonological outputs given a specific morpho-syntactic structure, and if the speaker does not have an independent phonological output for D (i.e., an article), then the only way that a definite interpretation can

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[10] I do not discuss generic interpretations here but also assume that the possibility of a Generic operator binding the variable is available.

[11] As noted above, the lack of a D projection means that the variable introduced by Num can by bound through existential closure, giving rise to an indefinite interpretation.

[12] Ultimately I hope to derive this constraint from a more general constraint on ALL HEADS, i.e., a constraint which states that any head in the syntax is licensed if it is associated with some phonological material (either a specifier or a span). For the purposes of this paper, however, the more specific constraint given in (8) will have to suffice.

be achieved is through signalling the presence of a definite D in some other way. The syntax can presumably build whatever structure it wants, but if there is no output then the result is unacceptability. Available spell-outs of spans must simply be learned and stored in a list. For example, in MC, we have the information in (9a) stored, and in Cantonese we have the information in (9b) stored (more on the specifics of this in sections 3.4 and 3.5):

(9) a.

$$\text{D}$$
$$\diagdown$$
$$\text{Num}_\emptyset \quad\rightsquigarrow\quad \text{spell-out} \quad\longrightarrow\quad \{mao,\ shouji,\ zhuozi,\ ...\ \}$$
$$\diagdown$$
$$\text{Cl}$$
$$\diagdown$$
$$\text{N}$$

b.

$$\text{D}$$
$$\diagdown$$
$$\text{Num}_{[+atomic]} \quad\rightsquigarrow\quad \text{spell-out} \quad\longrightarrow\quad \{go,\ bun,\ zek,\ ...\ \}$$
$$\diagdown$$
$$\text{Cl}$$

Necessarily then, 'flagging' possibilities will be limited by the kind of input that the child gets. The reason that Cl-N configurations in MC can never be definite is assumed to be that there was nothing in the input that would lead a learner to posit the span in (9b).[13] This way of conceptualizing the constraint requires that we assume that the structure of nominals is universal and fixed across languages: when attempting to navigate the hypothesis space of possible interpretations for nominals, the child has access to a set of constraints which allow it to close in on the appropriate representations that match the phonology (and the meaning) of the input. Thus we ultimately place the locus of cross-linguistic variation in the lexicon, and in the ways in which syntactic structure maps to a morpho-phonological output stored therein.
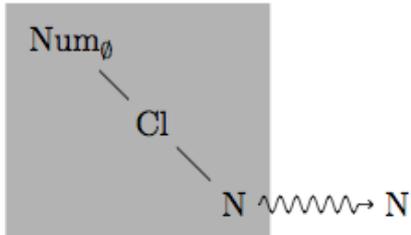
3.4. Structure of the noun phrase in MC

Here I present the structures associated with each of the different noun phrase configurations available in MC, and show how the constraint on D discussed above allows us to explain the constraints on interpretation on each type of noun phrase. Spans across heads are highlighted in grey, wiggly lines show spell-out, and the result of spell-out is given as N or Cl, which are stand-ins for phonological strings which are members of the sets of elements that a speaker normally refers to as a 'noun' or 'classifier', respectively (e.g., N might be *gou* 'dog', or *tuoxie* 'slippers', and Cl might be *ge* (general classifier), or *duo* (classifier for flowers, clouds)):

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[13] This would lead us to imagine that a diachronic shift from Cl-N definites to bare N definites, and vice versa, is quite possible, if not likely. I leave this to future research.
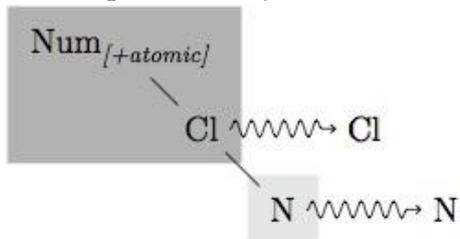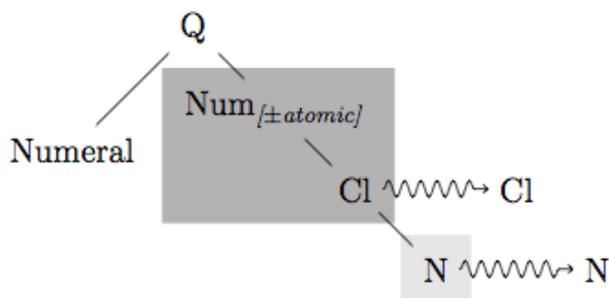
(10)   *Bare noun (definite)*

D
　＼
　　Num$_\emptyset$
　　　　＼
　　　　　Cl
　　　　　　＼
　　　　　　　N 〜〜〜→ N

(11)   *Bare noun (indefinite)*

Num$_\emptyset$
　　＼
　　　Cl
　　　　＼
　　　　　N 〜〜〜→ N
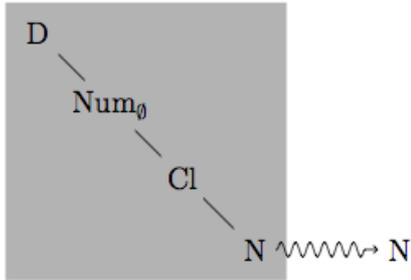
(12)   *Cl-N sequence (indefinite)*

Num$_{[+atomic]}$
　　　＼
　　　　Cl 〜〜〜→ Cl
　　　　　＼
　　　　　　N 〜〜〜→ N

(13)   *Numeral-Cl-N sequence (indefinite)*

　　　Q
　　／　＼
Numeral　Num$_{[\pm atomic]}$
　　　　　　＼
　　　　　　　Cl 〜〜〜→ Cl
　　　　　　　　＼
　　　　　　　　　N 〜〜〜→ N

In the case of Cl-N sequences, a definite interpretation is never available because there is no span from Cl to D through Num$_{[+atomic]}$ which spells out as Cl in Mandarin. A span from N up to D is only available when Num is empty (Num$_\emptyset$), forcing a number neutral interpretation for bare nouns. A span across Cl and Num is possible when Num is either [+atomic] or [–atomic], spelling out as a classifier, capturing the fact that the presence of a numeral can give rise to either singular or plural interpretation, depending on the number.

　　When an adjective is merged in the low position, immediately preceding the noun, the available interpretations are the same as with unmodified bare nouns. This is because the spans spell out low in N, and specifiers spell out to the left of heads. (14a) shows a definite Adj-N sequence, (14b) an indefinite Adj-N sequence. In the case of HMNs, the adjective is

merged in spec D,[14] licensing the definite head, and forcing a definite interpretation (15). If no D projects, there is no high merge site for the adjective. Where D hosts an adjective, it meets the licensing criterion in (8c), and the iota operator binding the individual variable introduced in Num means that a definite interpretation is forced. I assume that the low adjective merge site is either in the spec of a dedicated functional head (Cinque 1994, et seq.),[15] or is in spec N, but chose the latter in the graphical representation of the structure for clarity's sake.

(14) a.   b.

(15)
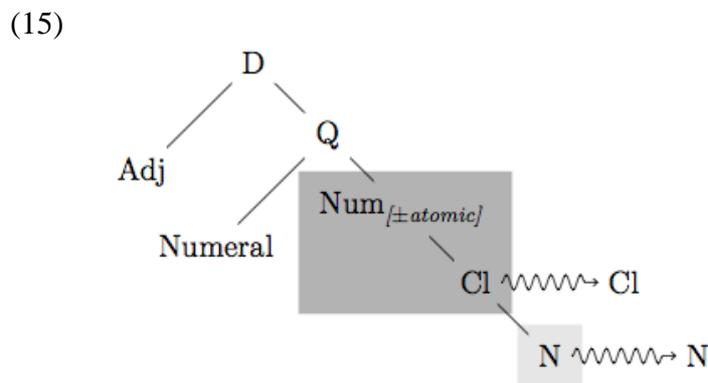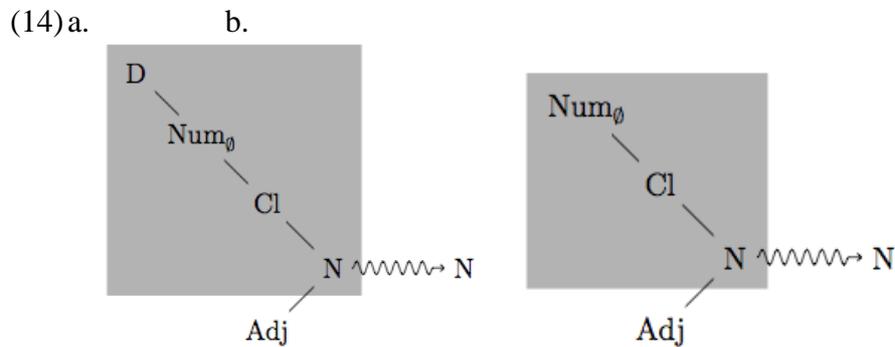
We have seen how each of the available interpretations for different configurations of argument nominal can be derived. I now extend the spanning account to Cantonese, an example of a 'type B' language.

3.5. Extending the account to Cantonese

Cantonese has the following interpretational constraints on the noun phrase:

Table 3: Noun phrase interpretation in Cantonese

| Noun Phrase Config	Definite	Indefinite	Number
N	No	Yes	Neutral
Cl-N	Yes	Yes	Singular[16]
Num-Cl-N	No	Yes	Singular/plural

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[14] For reasons of space, I leave aside the question of whether this is a base merge position or a position resulting from a movement operation (from the lower, canonical position for adjectives).

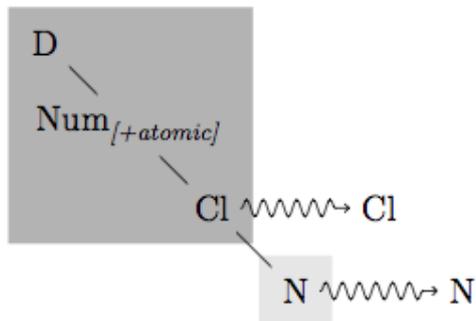[15] Spans from N upward in this case would have to include that functional head.

[16] A *di*-N sequence is plural, but unfortunately I cannot discuss *di* here for reasons of space.

We can account for the Cantonese facts in the same way as with Mandarin, assuming the following structures (with spans highlighted in grey).
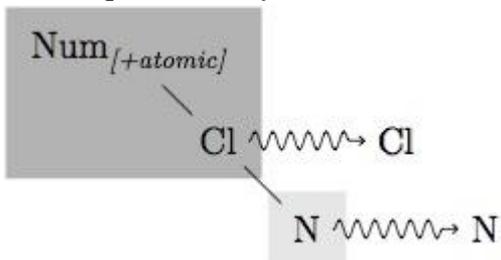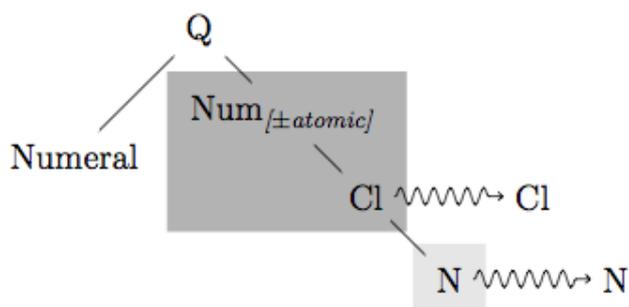
(16)   *Bare noun (indefinite)*

$Num_{\emptyset}$
    Cl
        N ⟿ N
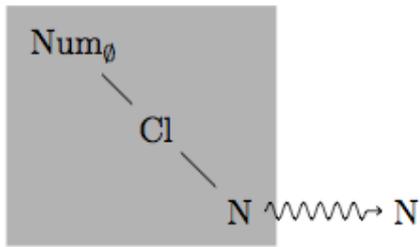
(17)   *Cl-N sequence (definite)*

D
    $Num_{[+atomic]}$
        Cl ⟿ Cl
            N ⟿ N

(18)   *Cl-N sequence (indefinite)*

$Num_{[+atomic]}$
    Cl ⟿ Cl
        N ⟿ N

(19)   *Numeral-Cl-N sequence (indefinite)*

Q
  Numeral $Num_{[\pm atomic]}$
                Cl ⟿ Cl
                    N ⟿ N

The indefinite Cl-N, indefinite bare noun and Numeral-Cl-N sequences have the same structure as we saw for Mandarin. The definite Cl-N sequence, however, involves a span from Cl to $Num_{[+atomic]}$ to D, giving rise to a definite reading. This is the span that is not available in MC.

Summarizing everything discussed so far, we have the generalizations given in table 4 about spans across functional heads in the domain of the noun phrase in Mandarin and Cantonese (on the assumption that Q blocks any span past Num):

Table 4. Spanning availability in Mandarin and Cantonese

	Up to Num$_\emptyset$	Up to Num$_{[+atomic]}$	Up to D
Span from N	Both	Neither	Mandarin only
Span from Cl	Neither	Both	Cantonese only

We see that the difference between the two languages lies in how far up certain spans are allowed to go. Spans staring at N and extending to D are only possible in Mandarin, and spans starting at Cl and extending to D are only possible in Cantonese. Other spans are the same in both languages.

4. A head movement account and its limitations

Simpson (2005) and Wu & Bodomo (2009) propose a head movement account of the variety of interpretational restrictions on different noun phrase configurations in Cantonese, generally following the insights of Longobardi (1994). Cheng & Sybesma (1999) also include head movement as part of their explanation for the differences between Mandarin and Cantonese. The proposals differ in their assumptions about the locus of definiteness, and about universals of syntactic structure. However, one fact about each head movement analysis is that it makes the prediction that a definite bare noun which is modified by an adjective should precede that adjective, which is contrary to what we actually see in Mandarin.

Cheng & Sybesma argue that the Cl head in Mandarin and Cantonese plays the (semantic) role that D does in English. They state that there is a condition on interpreting Cl as an iota operator, and that this condition is simply that the Cl position be filled.[17] In Cantonese, the classifier is overt, and thus the Cl head is filled. In Mandarin, N moves to the Cl projection in the case of a definite bare noun. Given that the canonical order of elements in the DP in Mandarin is Num > Cl > Adj > N, N movement to Cl would give rise to the order N > Adj when N is definite, which does not hold for Mandarin (the order N > Adj is always unacceptable).

Simpson (2005) and Wu & Bodomo (2009) posit a D projection as the locus of definiteness, and take it to be Cl moving to D that gives rise to a definite interpretation in Cantonese. They do not discuss Mandarin, but one could imagine extending this analysis by arguing that in Mandarin, N moves to D for a definite interpretation. In that case, we have the same problem that the Cheng & Sybesma account faces, namely that the wrong order is predicted when a definite bare noun is modified by an adjective.

An alternative would be to claim that it is the Cl head which moves to D even in Mandarin, and that Cl is null in the case of bare nouns. However, this would make it necessary to make some quite unusual stipulations about the phonological content of Cl in different contexts. Without going into details, one would have to claim that in Mandarin, a definite interpretation (with movement of Cl) would force the Cl to be phonologically null

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[17] On this point my account and Cheng & Sybesma's are very similar, in that both accounts posit a morphological licensing condition on the head which hosts the iota operator.

(only bare nouns are definite), and an indefinite interpretation (with no movement of Cl) would mean that Cl could be either null or overt (bare nouns and Cl-N phrases can both be indefinite). A null head moving to a null head to license a particular feature on the higher head seems unsatisfying as a solution to the problem.[18]

Overall, the various alternatives of the head movement account mean that we either get the word order wrong when adjectives are taken into consideration, or we have to make some very unwelcome stipulations about what kind of phonological content is spelled out in the Cl head.

As discussed above (section 3.4), the low spell-out of the span in (14) means that the adjective precedes the (bare) noun even where we have a definite interpretation. It is this characteristic of the spanning approach which makes it superior to a head-movement approach in this case; head movement forces the head up the tree, but the ordering of elements suggest that it is pronounced low. A non-movement account thus captures the data more straightforwardly.

The spanning approach gets the word order right, and leads to generalizations which do not require the same kind of stipulations that we need to force the word order to work in the head-movement approach.

5. Crosslinguistic evidence

Given the different possible licensing conditions on D presented in section 3.3 (8), one would expect that this opens up a number of potential options that languages have available to them, and that therefore different languages would make use of different sets of the options available. Logically there are 8 possibilities, summarized below:

(20) a. Article only
  b. Span spell-out only
  c. Filled Spec only
  d. Article & Span
  e. Filled Spec & Span
  f. Article & Filled Spec
  g. Article & Filled Spec & Span
  h. No definite interpretation

If we take possessive DPs to involve a phrasal possessor in spec D (which licenses a definite reading), then it is likely that no languages make use of the (a) or (b) options, unless possession is realized in some other way (Romance languages might be such a case). Below I give the examples of Bangla as a language that looks like option (c), and Nuosu Yi as a language that looks like option (d). I have claimed in this paper that MC and Cantonese are languages which exemplify option (e). (f) looks not unlike English, again if we take possession to involve a filled spec D position which licenses a definite D head. I do not know of a language matching option (g), but hope that further cross-linguistic investigation would

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[18] Another alternative would have the movement of N to D/Cl to be LF head movement. This solution is unsatisfying, particularly given that head movement is known to generally not give rise to any semantic effects (Chomsky 2001, Adger 2013; see Lechner (2005) and Roberts (2010) for arguments that there are interpretive effects of head-movement).

shed light on the possibility of its existence. I expect that option (h) is not a possible language, on the assumption that something like definiteness (that is, a D projection) and the constraint on its being licensed are given *a priori,* and that the task of the child acquiring a language is to try to map parts of the primary linguistic data onto potential licensors of functional elements, including D. In acquisition, the child has to work out not only what is flagging D, but also which types of flagging are available.

I will now briefly present two interesting cases out of the possibilities that I presented above, and also illustrate that the analysis of MC and Cantonese provides a simple explanation for the behaviour of a definite article in a classifier language, Nuosu Yi.

5.1. Span spell-out and article spell-out

An interesting case is Nuosu Yi, a Tibeto-Burman classifier language which has a definite article *su*, and which has bare nouns that can be interpreted as either definite or indefinite. I present here a summary of the possible noun phrase configurations and their related interpretations (summarized from data presented in Jiang 2013 and Gerner 2014):

Table 5: Noun phrase interpretation in Nuosu Yi

Noun Phrase Config	*Interpretation*
N Cl	[--def] (singular)
N Cl *su*	[+def] (singular)
N	[±def] (number neutral)
N *su*	*

Given that bare nouns can be interpreted as definite, we assume (as with MC above) that there is a span available from N to D, licensing a definite interpretation. The language also has a definite article *su*, which forces a definite interpretation when it combines with a N-Cl sequence. What is relevant to the discussion here is that a noun immediately followed by the definite article is ungrammatical. This fact is neatly explained by the spanning account given above: a bare noun with a definite interpretation is the spell-out of a span which includes the D head, and so that head could not spell out as a separate article (assuming that one is forced to spell out the largest possible span available). There is only one D head; either it is included in the span and spelled out with it, or it is spelled out separately as an article.

5.2. Filled spec only

Bangla is potentially an example of a language which only makes use of the filled spec licensing option. Summarizing data from Bhattacharya (1993) and Dayal (2012), we have the following paradigm:

Table 6: Noun phrase interpretation in Bangla

Noun Phrase Config	Interpretation
Numeral Cl [N]	[-- def]
[N] Numeral Cl	[+ def]
Numeral Cl [A N]	[-- def]
[A N] Numeral Cl	[+ def]
Cl N	*
N Cl	[+ def]

Bhattacharya (1993) and Dayal (2012) have both argued that in its non-canonical position at the left edge of the DP, [N] or the constituent [A N] have undergone phrasal movement. In each case, this phrasal movement gives rise to a definite interpretation. Bare nouns in Bangla cannot have a definite interpretation (Dayal 2012), and so presumably there is no span from N to D available, suggesting that filled-spec is the only licensing possibility available in Bangla.

6. Conclusion

I have shown that differences in possible interpretations for different noun phrase configurations in MC and Cantonese, and the interpretational effects associated with a high adjective can be explained straightforwardly by an account which views the syntax-morphology interface to be mediated through the spell-out of spans. I have also shown that such an approach is superior to one which attempts to explain the same effects through head-movement of N (or Cl) to D.

The above argument leads to predictions about possible parametric variation, and discussion of Nuosu Yi and Bengali provides preliminary evidence that those predictions may be borne out (following further cross-linguistic investigation). Another consequence of the discussion is that a parsimonious account of the facts can be achieved through the positing of a D functional projection even in languages which have no overt articles. This suggests that the recent attempts to argue that the DP hypothesis does not hold for argument nominals in languages like Mandarin (see, e.g., Bošković 2008) might require rethinking; here we have another case where surface dissimilarity obscures, but does not preclude, underlying parallelisms.

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