

Deriving the order of constituents in the Javanese DP

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Abstract

This paper presents the distribution of the constituents inside the DP in Javanese and establishes the syntactic derivations that yield the surface order of the constituents. Unlike the previous work by Davies and Dresser (2005), which states that the ordering of the DP constituents is relatively free and derives the DP internal structure via head-movement, our data reveal rigid ordering of the elements once interpretation is taken into consideration. Adopting the idea of a universal hierarchy of Dem>Num>Adj>N (Cinque, 2005), the paper derives the surface constituency of the DP by (remnant) phrasal movement, drawing on the derivational theories proposed by Cinque (2005, 2007) and Kayne (1994).

1. Introduction*

This paper provides a preliminary description and syntactic analysis of the DP in Javanese, a Western Austronesian language spoken by more than 75 million people in the central and eastern parts of the island of Java in Indonesia. The data reported in this paper are in the *ngoko* (informal) register, and were collected in Los Angeles with a Javanese-Indonesian speaker, who was raised in Malang, East Java, and lived as an adult in Jogjakarta, Central Java.¹

Javanese is a SVO head-initial *wh*-in-situ language with prepositions, postnominal possessors and relative clauses, and an elaborate verbal voice system: the active voice (AT) prefix '*ng-*' and its allomorphs (see Horne 1961:103), the theme voice (TT) prefixes, which spell out both features of TT and person features of the external argument ('*dhik-*'=TT+3rd person, '*tak-*'=TT+1st person, '*tok-*'=TT+2nd person), the accidental voice '*ke-*', and various applicative voices (e.g., causative/ benefactive/ locative). Javanese allows pro-drop and topic-drop, and makes heavy use of left and right dislocation. Verbs lack tense or agreement morphology. Non-verbal predication is extensively used. As in other Austronesian languages (e.g., Tagalog: Kroeger 1993, Balinese: Wechsler and Arka 1998),

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¹ Javanese is characterized by the complex register system consisting of *krama* (formal), *madya* (semi-formal), and *ngoko* (informal) registers.

relativization is limited to syntactic subjects (see (1a)) and subjects of possessors (see (2)). Theme arguments can be relativized only when the sentence is in the theme voice, as exemplified in (1b) and (1c):²

- (1) a. *Sing endi murid-é sing nyolong telung kranjang pelem.*
REL which student-né REL AT.steal three.LNK basket mango
‘Which one is the student who stole three baskets of mangoes?’
- b. *Aku maca buku sing ditulis (karo) Putri.*
I AT.read book REL TT.write (by) Putri
‘I read the books {that were written by Putri / that Putri wrote}.’
- c. * *Aku maca buku sing Putri nulis.*
I AT.read buku REL Putri AT.write
Intended: I read the books that Putri wrote.

The following sentence is an example of the relativization of the subject of the possessor.

- (2) *Bejo ketemu bocah lanang sing bapak-é mati.*
Bejo ACCV.meet child boy REL father-né AT.die
‘Bejo ran into the boy whose father died.’

In (2) the suffix *-né* is ambiguous between the D and the 3rd person possessive pronoun; thus *bapak-é* could mean either ‘the father’ or ‘his father’.³ In this paper, I will simply treat *-né* as a D with an optional 3rd person sg. feature which identifies a third person singular *pro* (i.e., *bapak-é(3sg) pro(3sg)*, ‘his father’).

Sing relative clauses, which will be discussed in more detail in the following sections, are used extensively and play an important role in the DP in Javanese: they are used in subject relatives with adjectival predicates, and in partitive constructions (3a) (whose analysis is beyond the scope of the present paper), and they also serve as a grammatical device for focus within the DP (3b). Examples of these are given below:

- (3) a. *Anak-ku lima, sing telu wédok.*
child-my five, REL three female
‘I have five children, three of them are girls.’ (Horne 1961:288)

² The following abbreviations are used in the glosses: AT=active voice, TT=theme voice, ACCV=accidental voice, REL=relativizer, DEM=demonstrative, LNK=linker.

³ The distribution of *-né* vs. *-é* is phonological: after a consonant, it is realized as *-é*, and after a vowel it is realized as *-né*. The status of the suffix *-né* in non-possessive uses like (1a) is unclear: it shows properties of determiner, topicality, and also (structural) case. Following Davies and Dresser (2005), who call *-né* the definite particle, I assume *-né* is some kind of a D-like element and treat it as the D in this paper.

b. *Bocah iku nggawa kertas putih sing tuwa.*
 child DEM AV.carry box white REL old

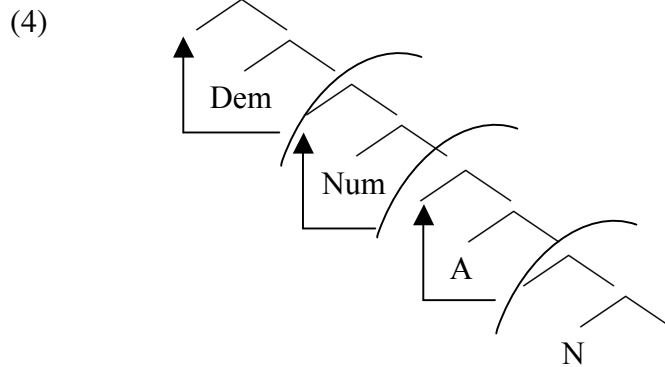
‘That child was carrying an OLD white box.’

(Context: ‘old’ is focused: among all the white boxes, the old one was carried.)

Turning next to the constituency of the DP, the typological work by Rijkhoff (1990: cited in Cinque 2005, fn.19) reports that the Javanese DP exhibits the surface word order [N-Adj-Num-Dem]. This is consistent with the order observed in the data from our speaker. In contrast, Davies and Dresser (2005), which appears to be the only theoretical work on the Javanese DP thus far, argues that Javanese has relatively free ordering of the elements inside the DP, as far as adjectives, relative clauses and numerals are concerned. In order to account for the particular distribution of adjectives, they analyze bare adjectives as first undergoing right adjunction to N, and then moving with the N to adjoin to the left of D. Our data superficially support Davies and Dresser’s (2005) observations: numerals, adjectives and relative clauses appear in two or more positions inside the DP respectively. Nevertheless, our data reveal that different positioning necessarily associates with different semantics and syntax.

The syntactic assumptions that the remainder of this paper builds upon come from Cinque (2005), who examines the typology of the order of DP constituents (i.e., Demonstrative, Numeral, Adjective, and Noun) and proposes an analysis that involves no adjunction. The idea is that, if there were no constraints, we would expect every possible ordering of the DP constituents to be attested in the world’s languages. Mathematically speaking, there are 24 (4x3x2x1) potential orderings for four constituents: Dem, Num, Adj and Noun. However, some orders (10 patterns) are never attested while others are frequently observed (i.e., orders such as [Dem-Num-A-N] or [N-A-Num-Dem]) (see Cinque 2005). Cinque (2005) aims to account for the gaps in the paradigm and proposes that there is a universal hierarchy and an order in terms of the merged position of the elements inside the DP (i.e., Dem>Num>A>N) as well as universal constraints on what kind of movements are allowed. His proposal is that the attested patterns can be explained if the movement is restricted to (remnant) phrasal movement of constituents containing the N. The gaps in the paradigm are something that cannot be ignored, and Cinque’s (2005) work is the only proposal to account for the gaps in the paradigm; thus, the analysis presented here will be built upon his proposal of the universal hierarchy and the possible movement type.

Returning to the linear order among the constituents inside the Javanese DP, the order observed in our data and also reported by Rijkhoff is the mirror image of the universal hierarchy of merger Dem>Num>A>N proposed by Cinque (2005). This is a frequently attested order, and is analyzed as deriving from the universal hierarchy via successive phrasal movement from complement to specifier in a roll-up fashion, as illustrated below (this is a simplified tree, see Cinque 2005:318 for a fuller tree):



This seems to be a straightforward analysis. However, once we take the D *-né* and the Possessor into consideration, a more complex picture arises and the surface order is no longer the mirror image of the universal hierarchy. A modified derivation will be proposed in section three.

2. The description of the Javanese DP: building blocks and the linear order

The elements that appear inside the Javanese DP are nouns, adjectives, the D *-né*, possessors, demonstratives, *sing* relative clauses (RC) and two types of numerals: (i) prenominal numerals, which take a dependent form consisting of a bare numeral and a linker *-ng* and which have to be immediately followed by a classifier-like noun (CL) (i.e., Num-*ng* CL), and (ii) postnominal numerals, which are bare numerals. There is no visible agreement inside the DP in a strict sense. Plurality can be syntactically encoded in a reduplicated form of a noun, but reduplication is not obligatory (e.g., *buku* ‘a book/books’, *bukubuku* ‘books’). The linear order of the elements is illustrated in (5).

(5) a. The linear order of the elements inside the DP

Num- <i>ng</i> – CL – N – A – <i>né</i> – Possessor – Num – <i>sing</i> RC(A, Num) – Dem – <i>sing</i> RC
D
RESTRICT (FOCUS/PARTITIVE)
NON-RESTRICT

b. Illustration of the word order

	Num- <i>ng</i> CL	N	A*	D	Poss	Num	<i>sing</i> RC	Dem	<i>sing</i> RC
1. <i>aku tuku</i> I buy	<i>telung kilo</i> 3- <i>ng</i> kilo	<i>apel</i> apple							
2.		<i>asu</i> dog				<i>telu</i> 3		<i>iku</i> DEM	<i>sing putih</i> REL white
3. <i>aku ndelok</i> I AT.see		<i>asu</i> dog				<i>telu</i> 3	<i>sing putih</i> REL white	<i>iku</i> DEM	
4.		<i>asu</i> dog	<i>putih</i> white	<i>-é</i> ne	(<i>Siti</i>) Siti	<i>telu</i> 3			

<English translations>

1. I bought three kilos of apples.

2. I saw these three dogs, which are white.
3. I saw these three dogs that are WHITE. [capitalization illustrates focus]
4. I saw {Siti's / her /the} three white dogs.

Some constituents appear twice in table (5b), namely the *sing* RC, adjectives (as a bare adjective and inside the *sing* RC) and numerals (prenominally with a classifier, postnominally as a bare numeral and also in the *sing* RC). Superficially, this looks as if the ordering of the elements inside the DP were quite free, which is in fact what Davies and Dresser (2005) conclude for relative clauses, adjectives and numerals. However, this appears to be incorrect, as different positions associate with different semantics. More specifically, the *sing* RC preceding a demonstrative is a restrictive RC, whereas the *sing* RC following a demonstrative is a non-restrictive RC denoting appositive information, as shown in the English translations (5b2) and (5b3). Adjectives appearing inside the *sing* RC are generally focused (as illustrated in the English translations for (5b3)). Certain adjectives, such as *jawa*, have different meanings depending on whether it is used as a bare adjective or in the *sing* RC: *jawa* means ‘Javanese’ as a bare adjective, but means ‘generous’ in the *sing* RC. The situation with adjectives is quite complex, and will be discussed in detail in section 3.3.

Numerals also superficially appear to be freely ordered. Davis and Dresser (2005:58) report so, and illustrate this with a single Javanese example:

- (6) *Hasan tuku {sepuluh kucing / kucing sepuluh}*
 Hasan buy {10 cat / cat 10}
 ‘Hasan bought ten cats.’ (Davies and Dresser 2005:(1))

Upon closer inspection, however, the distribution of numerals reveals great syntactic, morphological and semantic complexity, and their claim cannot be maintained.⁴ The numeral *sepuluh* ‘one.ten (10)’ differs from 1-9 in not having a dependent form (see (8b)). The distribution should therefore be examined for the numerals 1-9 that do have different prenominal and postnominal forms. The distribution of prenominal and postnominal numerals yields different interpretations. While much further research is needed, the following is clear: postnominal numerals always yield a count interpretation, and are morphologically simple (i.e., bare numerals).

- (7) a. *Aku nduwé {kursi lima /*kursi limang / *limang kursi / *lima kursi}*.
 I AV.have {chair 5 /*chair 5.LNK /*5.LNK cat / *5 cat}
 ‘I have five chairs.’

⁴ Javanese allows right dislocation of a constituent, as exemplified below:

- (i) *Aku kapang ndelok telutelu-né kucing-é*
 I want AV.see three.three-né cat-né
 ‘I want to see the three cats.’
 (Lit. I want to see the (pl.) three the cats.)

It is at this point unclear if the prenominal numeral in example (6) is inside or outside of the DP.

- b. *Rini tuku {kucing telu / *kucing telung / *telung kucing / *telu kucing}*.
 Rini buy {cat 3 / *cat 3.LNK / *3.LNK cat / *3 cat}
 ‘Rini bought three cats.’

Dependent numerals (1-9), on the other hand, are used to quantify mass nouns, and are usually followed by a measure term-like classifier noun:

- (7) *Siti tuku {rong kilo beras / patang séndhok gula}*
 Siti buy {2.LNK kilo rice / 4.LNK spoonful sugar}
 ‘Siti bought {two kilos of rice / four spoonfuls of sugar}.’

Some nouns alternate their meanings depending on the position of the numerals, which further supports the claim that pronominal numerals don’t yield a count interpretation of the noun, as shown below:

- (8) a. *Rini tuku {telung kilo buku / buku telu}*
 Rini buy three.LNK kilo book / book three
 ‘Rini bought {three kilos of used paper / three books}.’
- b. *Rini nulis {sepuluh lamba layang / layang sepuluh}*.
 Rini At.write {10 sheet letter / letter 10}
 ‘Rini wrote {a 10-page letter/10 letters}.’

In (8a), *buku* with a pronominal numeral means ‘used paper’ (mass), whereas *buku* with a postnominal numeral means ‘book’ (countable). (In Java, books can be bought in kilos as used paper). In (8b) the pronominal position of the dependent numeral gives the phrase the meaning a 10-page letter and the postnominal position of the bare numeral gives the phrase the meaning ten letters.⁵ In the remainder of the paper I restrict the attention to the distribution of postnominal numerals.

Another postnominal position where numerals occur is as a main predicate in a *sing* RC (numerals can be used as a non-verbal predicate). The following example yields either a partitive reading or a definite reading (see also Horne 1961).

- (9) *Asu-né Siti sing telu padha turu.*
 dog-né Siti REL three all sleep
 (a) Three of Siti’s dogs are all sleeping. (Siti has more than 3 dogs.)
 (b) Siti’s dogs that are THREE are all sleeping. (Siti has only 3 dogs.)

⁵ There are cases where the dependent form is immediately followed by a head noun, lacking a classifier, as in *limang kamar* (5.LNK room) ‘five rooms’, and *patang dina* (4.LNK day) ‘four days’. For these cases, I would like to propose that the phrase contains a silent classifier such as “SPACE” or “TIME” (i.e., *limang SPACE kamar* ‘5 rooms’, *patang TIME dina* ‘4 days’: see Kayne (2005a) for a similar proposal of the presence of a silent NUMBER, COLOR and YEARS). Further research is needed to understand the extremely interesting issues arising around pre- and postnominal numerals.

Headless relatives only receive a partitive reading, as in (10).

- (10) *Sing telu padha turu.*
REL 3 all sleep
'Three of *them* are all sleeping.'

This suggests that in (9a), an indefinite DP is promoted, while in (9b) a definite DP is promoted, as illustrated below:

- (9a): [SOME Siti's dogs] [sing ~~[SOME Siti's dogs]~~ three]
(9b): [THE Siti's dogs] [sing ~~[THE Siti's dogs]~~ three]

The relative clauses containing numerals have the same distribution as the regular restrictive relative ones.

Pending further research, the evidence thus far indicates that the order of the elements in the DP is not free but structurally determined. The remainder of the paper concentrates on what the order of postnominal elements is and how to derive their linear order from the hierarchical structure. Section 3.1 brings demonstratives into the picture. Section 3.2 introduces the distribution of the D *-né*. Sections 3.3 and 3.4 discuss multiple adjectives and numerals respectively. Section 3.5 deals with possessors. Lastly, section 3.6 adds the distribution of restrictive and non-restrictive relative clauses.

3. Deriving the linear order of Javanese DP, [N-A-D-Num-Dem]

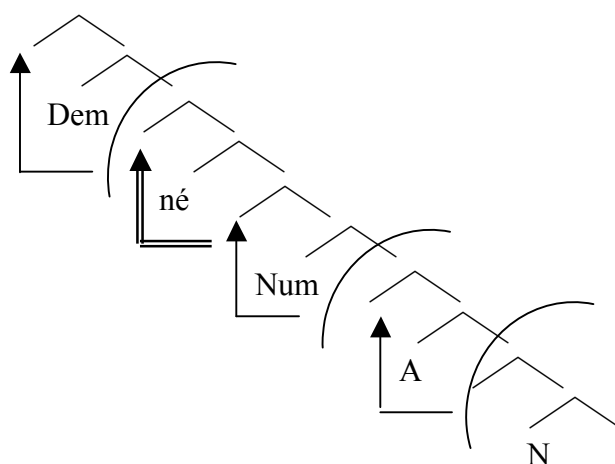
Recall that the linear order of the constituents of the Javanese DP is the mirror image of the universal hierarchy Dem>Num>A>NP. Therefore, the straightforward derivation seems to be the successive roll-up movement (*i.e.* pied-piping), as proposed by Cinque (1995). Nevertheless, as discussed in the previous section, when the D '*-né*' is brought into the picture, the simple successive roll-up can no longer derive the correct linear order in Javanese, which is NP-A-D-Num-Dem. Both the demonstrative and the D relate to definiteness; thus it would be most natural to locate the merged position of the D together with the demonstrative, which yields the expanded version of the universal hierarchy Dem>D>Num>A>NP.⁶ Then the derivation of the Javanese DP must involve the following steps:

⁶ Note that head movement derivation would not yield the right word order; it would yield the linear order [N-A-Num-D-Dem]. In order to derive the actual surface order using head movement, one has to assume that head movement is only possible up into the adjectival field, and the rest has to be phrasal movement.

(11) a. Proposed derivation for the Javanese DP

- (i) A merges with NP, and the NP is moved around the A.
- (ii) Num merges with (i) (i.e., the rolled-up constituent [N-A]). The N, pied-piping the A, moves around the Num.
- (iii) D *-né* merges with (ii) (i.e., the rolled-up constituent [N-A-Num]). Specifier extraction takes place and the N pied-piping the A (i.e., the rolled-up constituent [N-A]) moves around the D *-né*, stranding the Num.
- (iv) Dem merges with the DP (i.e., (iii); the constituent [N-A-né-Num]). The DP moves around the Dem, yielding the desired constituency and linear order N-A-né-Num-Dem.

b.



Keeping this big picture in mind, let us now examine each step of the derivation and its motivation in more detail.

3.1. Demonstratives

There are three types of demonstratives in Javanese: *iku* (*kuwi*) ‘that/those’ (closer), *kaé* ‘that/those’ (far), and *iki* ‘this/these’.⁷ In addition to their deictic uses, *iku* (*kuwi*) and *kaé* have anaphoric uses, referring to a pre-established NP. The demonstratives appear at the right-most edge of the DP, closing off the DP domain in the sense that a *sing* RC appearing to the right of a demonstrative is a non-restrictive RC (cf. (5-b-2)). The derivation involves raising DP to Spec,DemP as shown in (11b), and this movement is triggered by the EPP feature of the Dem that requires its specifier to be filled with an XP that has <+D> feature (i.e., DP).

⁷ Presumably *i-ku* and *kuw-i* are yielded by flipping under adjacency that comes from morphological merger in the sense of Halle and Marantz (1993) and Embick and Noyer (2001).

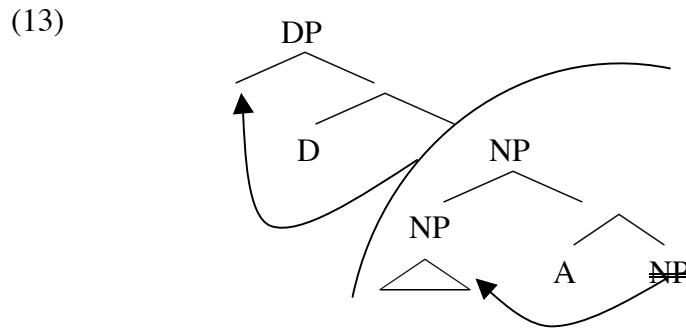
3.2. The D –né

The D –né immediately follows a noun or an adjective modifying a noun and implies previous mention in the discourse; thus it cannot be used in null context.

- (12) *Luwak (ireng)-é telu padha kecekel.*
 civet_cats (black)-né three all caught
 ‘The three (black) civet cats were all caught.’

Interestingly, –né does not appear inside a prepositional phrase nor on a postverbal subject, suggesting that it has some link with topichood or structural case (see fn. 3).⁸

The linear order of NP-D can be understood as involving the movement of NP to Spec,DP triggered by the nominal EPP (edge) feature of the D (*i.e.*, the D requires its specifier to be filled with a constituent that includes the nominal predicate). This nominal predicate can pied-pipe certain adjectives. In the tree presented below, the NP, pied-piping A, moves to Spec,DP, satisfying the nominal EPP feature of the D.



The question is why the NP needs to pied-pipe the A in Javanese (the alternative derivation would involve the specifier-extraction of the NP stranding the A). The fact that [Dem-Num-A-N] and [N-A-Num-Dem] are the two most frequently attested orders (Cinque 2005) seems to indicate that the default phrasal movement that a language prefers, either ‘specifier-extraction’ yielding the former order or ‘pied-piping’ yielding the latter order, is parametric. Since the actual linear order in Javanese is very close to the latter order [N-A-Num-Dem], pied-piping appears to be the unmarked phrasal movement in the Javanese DP:

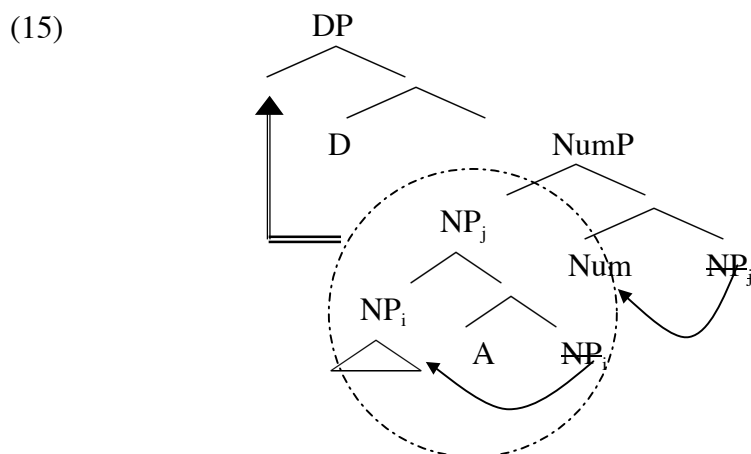
⁸ The D –né and the possessor marker –né basically shows the same DP internal distribution, occupying the same position (see table 5b). Interestingly, however, the distribution of the possessive –né is broader than that of the D –né, such that it appears inside the PP and on the postverbal subject.

- (i) *Ana buku ning dhuwur méja-né Putri.*
 there book on above table-né Putri
 ‘There is a book on Putri’s table.’

Without *Putri*, *méja-né* ‘table-né’ means his/her table, but cannot mean ‘the table’.

- (14) In the Javanese DP, ‘pied-piping’ is the unmarked phrasal movement, whereas ‘specifier-extraction’ is marked.

The question is the following: if ‘pied-piping’ is the unmarked phrasal movement in Javanese, why is the actual order not exactly the mirror image of the universal hierarchy? Recall that the universal hierarchy we assume is $\text{Dem(D)} > \text{Num} > \text{A} > \text{N}$ (namely the Num intervenes between the D and the A, as in English ‘the three big dogs’), whereas the linear order of the constituents in Javanese is N-A-D-Num-(Dem) as exemplified in (11) but not N-A-Num-D-Dem : successive roll-up no longer yields the actual surface order. As proposed in the previous section, the correct order can be derived only if the derivation involves a step of ‘specifier-extraction’ at NumP: namely, moving the rolled-up constituent $[\text{NP-A}]$ from Spec,NumP to Spec,DP , stranding the Num as illustrated in (15).



The remaining question is: if pied-piping is the unmarked phrasal movement in Javanese, as stated in (14), how can we make sense of this part of the derivation? It is not the case that NP pied-piping Num cannot satisfy the nominal EPP feature of the D. Then why does the marked movement, spec-extraction, take place instead of pied-piping? The answer I would like to explore in this paper is that this is because of the property of the D: namely, the output would violate a property of Spec,DP .⁹ The distribution of adjectives, which will be discussed in the next section, will give us some insight on this issue.

⁹ Alternative answer would be that the NumP is prohibited from moving since it is a complement of a Phase head D in the same way as TP is prohibited from moving when it is the complement of C (see Abels 2003, Kayne 2005b). Nevertheless, the possessor actually intervenes between the D and the NumP in the Javanese DP (see section 3.5), thus this account cannot explain the phenomenon.

3.3. Adjectives

Adjectives in Javanese exhibit very interesting distributional properties. First, almost all the adjectives that we were able to elicit can serve as main predicates, as exemplified below.¹⁰

- (16) *Siti (ora) tuwa.*
 Siti (NEG) old
 ‘Siti is (not) old’

Second, in their attributive bare uses, adjectives cannot be intensified: intensified adjectives necessarily appear in a *sing* RC. Given that intensified adjectives are naturally focused and that the *sing* RC serves as a focus device, this is not probably very surprising.

- (17) *Wong wédok *(sing) tuwa tenan teka ning omah-ku.*
 person female REL old very come at house-me
 ‘The woman who is very old came to my house’.

Third, the coordination of bare adjectives is not possible; coordination is only possible in a *sing* RC.¹¹

- (18) a. *Méja abang (*lan) bunder-è duwè-ku.*
 table red and round-né possession-my
 ‘The round red table is mine.’
 b. *Aku ndelok méja -né sing bunder lan abang.*
 I AT.see table-né REL round and red
 ‘I saw the table that was round and red.’

Fourth, there is a restriction on recursion of bare adjectives: only two bare adjectives can be stacked. In terms of the derivation, this means that at most two bare adjectives can be pied-piped with the NP and precede the D *-né*.¹²

¹⁰ One exception we encountered was *Jawa* ‘Javanese’, which is probably a case of lexical blocking. As stated in section 2, *jawa* also means ‘generous’ in the *sing* RC. When *jawa* is used as a main predicate, it can only mean ‘generous’, but not ‘Javanese’. The following was provided to express ‘Siti is Javanese’:

(i) *Siti saka Jawa.*
 Siti from Java
 ‘Siti is Javanese.’ (lit. Siti is from Java).

¹¹ This property of coordinating bare adjectives is different from what is reported in Davies and Dresser (2005:69), but they also report some interspeaker variability in this respect. Unfortunately, we did not elicit a sentence which contains more than two adjectives which belonging the same category, such as ‘The red and white table is mine.’ Whether the type of coordinated adjectives matters needs further investigation.

¹² Note that the ungrammaticality of (19b) is not due to the wrong relative ordering among adjectives (see (21)).

- (19) a. *Aku ketemu wong Jawa tuwa-né.*
 I ACCV.meet person Javanese old-né
 'I met the old Javanese person.'
- b. *Aku ketemu wong Jawa (*lanang) tuwa-né.*
 I ACCV.meet person Javanese male old-né
 'I met the old Javanese person/ *male person.'

When an NP is modified by three adjectives, one has to appear in a *sing* RC and receives a focus interpretation. When asked for a Javanese translation of the English sentence 'I met the old Javanese man', our speaker told us that she needed to know which element is the most important. The following is the sentence given, when 'old' is the most important element:

- (20) *Aku ketemu wong Jawa lanang-é sing tuwa.*
 I ACCV.meet person Javanese male-né REL old
 'I met the Javanese man (male person) who is OLD.'

Since bare adjectives are stackable up to two in Javanese, one natural question would be: what order do they appear in when stacked? From various crosslinguistic works on adjectives, it has emerged that adjectives are universally ordered along the following hierarchy (e.g., Sproat and Shih 1988, 1991, Shlonsky 2000, Cinque 2007, among others).

- (21) The universal relative ordering among adjectives
 [subjective comment > size > age > shape > color > nationality > material]

It turns out that Javanese adjectives appear in the inverse order of the universal hierarchy, as shown in (22). This is not at all surprising given that the other constituents in the DP in Javanese also exhibit the (almost) mirror image of the universal hierarchy.¹³ The

¹³ Contextualized sentences as in (i) were used to elicit the relative ordering among adjectives so as to elicit adjectives modifying a noun with a determiner *-né* (i.e., a noun pre-established in the discourse). When adjectives are in *sing* RCs, the order becomes quite flexible: it depends on the focus. Since the relativizer *sing* can be sometimes omitted, the only way to make sure that we are dealing with bare adjectives rather than ones in a *sing* RC was to elicit a pre-established noun.

- (i) a. *Aku {nemu / ndelok} kranjang abang cilik-é*
 I AT.find / AT.see basket red small-né
 'I {found / saw} the small red basket.'
 (Context: the hearer knows that the speaker lost [NP-A-A] (the small red basket).)
- b. *Kertas tuwa gedhè-né duwè-ku.*
 box old big-né possession-me
 'The big old box is mine.'
 (Context: the speaker saw a child carrying her box, and telling her friend that the NP-A-A (the big old box) that a child was carrying was hers.)

adjective meaning ‘Subjective comment’, which is the structurally highest adjective in the list, can be used only predicatively in a *sing* RC: it can never appear as a bare adjective (e.g., **méja apik-e* Int. ‘the beautiful table’). This means that, in the derivation, they cannot be pied-piped with the NP.

(22) Javanese relative ordering among adjectives

[material–nationality–gender–color–shape–age–size–subjective comment]

Intriguingly, there are distributional differences among adjectives. Depending on their positions in the hierarchy, the adjectives seem to be able to be divided into three regions, as illustrated by the shading gradation in the following table:

(23) The illustration of adjectival order

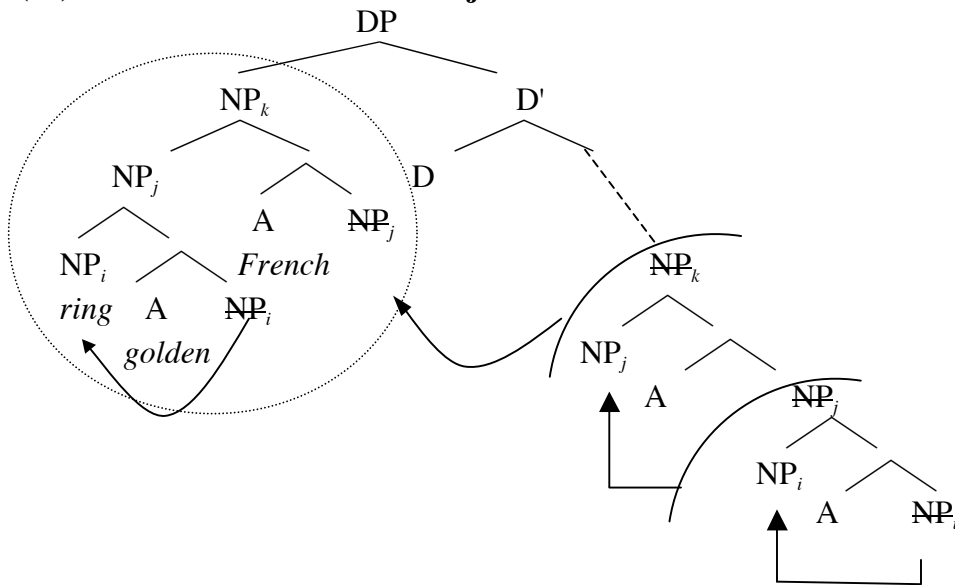
material<	nationality	< gender	< color	< shape	< age<	size <	subjective comment
<i>Low</i> ←				<i>Mid.</i>			<i>High Adj.</i> →
<i>emas</i> 'golden'	<i>Jawa</i> 'Javanese'	<i>wadon</i> 'female'	<i>putih</i> 'white'	<i>bunder</i> 'round'	<i>anyar</i> 'new'	<i>gedhè</i> 'big'	<i>ayu</i> (people) 'beautiful'
<i>kayu</i> 'wooden'	<i>Prancis</i> 'French'	<i>wédok</i> 'female'	<i>ireng</i> 'black'	<i>kothak</i> 'square'	<i>tuwa</i> 'old'	<i>cilik</i> 'small'	<i>apik</i> (thing) 'beautiful'
		<i>lanang</i> 'male'	<i>abang</i> 'red'	<i>dawa</i> 'long'	<i>enam</i> 'young'	<i>lemu</i> 'fat'	<i>jawa</i> 'generous'
NP emas Prancis- é NP gold French-né							
	NP dawa wédok-né NP Javanese female- NE						
		NP wadon ireng-é NP female black- NE					
			NP abang dawa -né NP red long - NE				
				NP bunder anyar-é NP round new-né			
					NP tuwa gedhè -né NP old big - NE		
						NP gedhè-né <i>sing</i> apik NP big-né REL beautiful	

As stated, the adjectives in the high region, subjective comment (e.g., *apik* ‘beautiful’ and *rusuh* ‘untidy’), only have predicative uses and must appear in a *sing* RC. On the other hand, the adjectives in the low and middle regions can appear either as bare adjectives or as predicates inside a *sing* RC. The low adjectives, *i.e.*, material, nationality, gender and color, turn out to be quite freely stackable and almost always appear as attributive adjectives; they require a rather clear focused context to be in a *sing* RC. The middle adjectives, *i.e.*, shape, age and size, tend to be in a *sing* RC, but also appear as bare adjectives. Presumably, the attributive and the predicative distinction for the middle adjectives is also due to a focus difference, but it is less clear than the cases with low adjectives: subtle pragmatics or information structure seem to affect the distribution, and the distribution is not always consistent. For example, *gedhè* ‘big’, which belongs to size, needs to be in a *sing* RC when modifying an object NP but is used as a bare

adjective when modifying a subject NP (see fn.13 (i-b)). This is understandable since objects tend to be new information and are probably naturally focused. Nevertheless, *cilik* ‘small’, which also belongs to size, does not show such subject-object asymmetry and appears as a bare adjective in both situations (see fn.13 (i-a)). The distribution of middle adjectives needs further investigation. Finally, the important property to note is that restrictions on recursion hold for any two pairs of adjectives out of the low and middle regions.

The distribution of bare adjectives discussed above, such as the restrictions on recursion (max two), on coordination and on intensified adjectives, points to the idea that adjectives that can be pied-piped with the NP to Spec,DP cannot be structurally too big (i.e., larger than a certain size). What does ‘structurally too big’ mean in terms of the derivation we have pursued in this paper? The derivation with the adjective proposed in the beginning of section three has two steps: (i) the NP pied-pipes the adjective, and (ii) the NP raises to Spec,DP to satisfy the nominal EPP feature of the D. The structure can be easily extended to cases of pied-piping two adjectives, as illustrated below:

(24) The derivation of bare adjectives



There seems to be nothing that prohibits rolling up three adjectives in this derivation: One more level of rolling up before moving to the Spec,DP should be able to derive the linear order [NP-A-A-A-D]. However, this seems to be an impossible derivation in Javanese: why should this be the case? One obvious difference between pied-piping three and two adjectives is the amount of material that ends up occupying the specifier of DP. Could it be the case that there is a restriction on the size of the phrase that can occupy Spec,DP? Such a restriction is in fact proposed by Koopman and Szabolcsi (2000), Kayne (1994), Koopman (2002), and Ross (1972).

Koopman and Szabolcsi (2000) account for the different word order and constituency of verbal complexes in Hungarian, Dutch and German despite their common underlying structure and identical derivations, by relying on overt (remnant) phrasal movement only. Given these derivations, however, there are unexpected language-

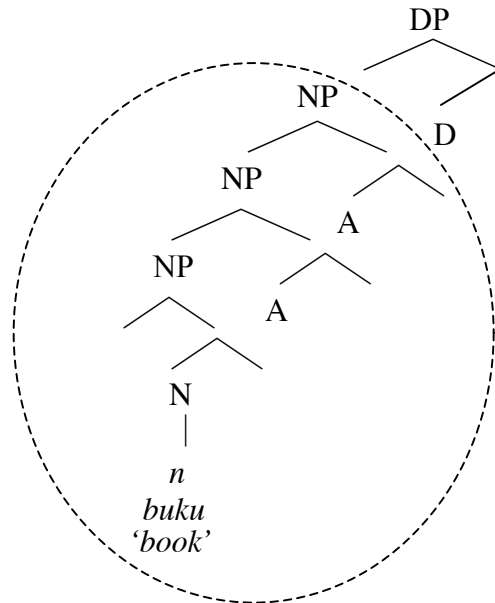
specific gaps in the paradigms (like restrictions on recursion for some categories, see Koopman 2002). Koopman and Szabolcsi (2000) argue that these gaps can be accounted for straightforwardly as output conditions (Ross 1972) which they call complexity filters. Complexity filters can be stated directly on the representations that the derivations generate, as lexical properties of individual heads. They are sensitive to spelled-out material only, and restrict the “size”, “shape” or “internal complexity” of constituents in their Spec position, where size is calculated in terms of the number of nodes that dominate the most deeply embedded phonological material. The filters determine the maximum size or complexity of overt material that can get carried along (i.e., pied-piping) to the Spec position, thus sometimes forcing spec-extraction (or splitting) instead of pied-piping to take place in the course of the derivation.

The above properties of bare adjectives can be understood as a manifestation of the language-specific complexity filter of the D *-né* in Javanese: namely, there is a restriction on the ‘size’ or ‘shape’ of the XP which can occupy the specifier of the D (XP corresponds to the circled NP in (24)). The distribution of adjectives reviewed in this section motivates the following complexity filter for Javanese:

(25) Javanese Complexity Filter on Spec,DP:

At the end of the derivation, Spec, DP cannot contain a constituent more complex than (a) containing a phonologically overt *n*.

(a)



This filter maximally allows an XP of the above size, thus resulting in the surface linear strings of [NP], [N-A] and [N-A-A]. It also accounts for the fact that coordinated structures (i.e., [NP [AP [and AP]]] *-né*) and intensified adjectives (i.e., [NP [A

[DEGR]]]) are excluded: the resulting constituents are either larger than the XP presented above or do not obey the shape allowed by the complexity filter.¹⁴

One remaining puzzle about adjectives is why high adjectives like *ayu* ‘beautiful’ cannot be pied-piped with the NP (recall that high adjectives always appear in a *sing* RC). If the availability of pied-piping is determined by the output size of the rolled-up constituent, the straightforward way to understand the inability for high adjectives to roll-up is to assume that pied-piping high adjectives result in a constituent size violating the complexity filter on the D.¹⁵ This account implies that even in the absence of phonologically overt adjectives, high adjectives cannot be directly merged to the NP but must always be merged higher than the other attributive adjectives: they require the presence of some intervening heads. An intuitive way to understand this idea is to compare it to a case like vP: vP is always structurally higher than VP, even if the verb is unergative and lacks a phonologically overt object. Alternatively, we can understand this property of high adjectives with the notion of a ‘phase’ in Chomsky’s (2000, 2001) sense. By the time high adjectives are merged, the phase that contains the NP undergoes Spell-out, and once the phase is closed off, it cannot be accessible to operations outside it. The presence of the phase boundary also necessarily results in a larger size.

The gradient effects on the ease of pied-piping (low adjectives versus middle adjectives) can also be understood in terms of size restrictions: the bigger the constituent, the more difficult it becomes to pied-pipe to Spec,DP. Note that the surface word order suggests that other heads, such as the Dem, do not have such a complexity filter as the D: the DP can freely move to the Spec,DemP regardless of its size (the demonstrative is DP final regardless of the number of elements (*or* size) that precedes it).

3.4. Postnominal numerals

The complexity filter on the D proposed in the previous section makes a prediction in terms of pied-piping the Num. Pied-piping of the Num should not be possible in Javanese, since numerals are merged higher than all adjectives and the rolled-up constituent that results from pied-piping high adjectives already exceeds the maximum size that can occupy Spec,DP. In other words, the complexity filter on the D predicts that the marked movement, *i.e.*, Spec-extraction, (extracting the AP from the Spec. of NumP) will occur rather than the pied-piping of the Num. This prediction is borne out, as we have already seen in section 3 and 3.2. The linear order in Javanese is not the mirror image of the universal hierarchy but N-A-D-Num (see (11)).

In the remainder of this paper, we will explore the structure of other constituents within the DP, (*i.e.*, possessors, restrictive and non-restrictive relative clauses), and derive the entire structure of the DP.

¹⁴ As discussed earlier, intensified adjectives are pragmatically focused, so this might instead be the reason intensified adjectives always appear in the *sing* RC.

¹⁵ Alternatively, this property could be explained if these adjectives are lexically marked as being inherently focused, since we have seen independently that focused adjectives cannot pied-pipe. Nevertheless, this account begs the question: why would the highest adjectives be inherently focused?

3.5. Possessors : Possessor marker -né

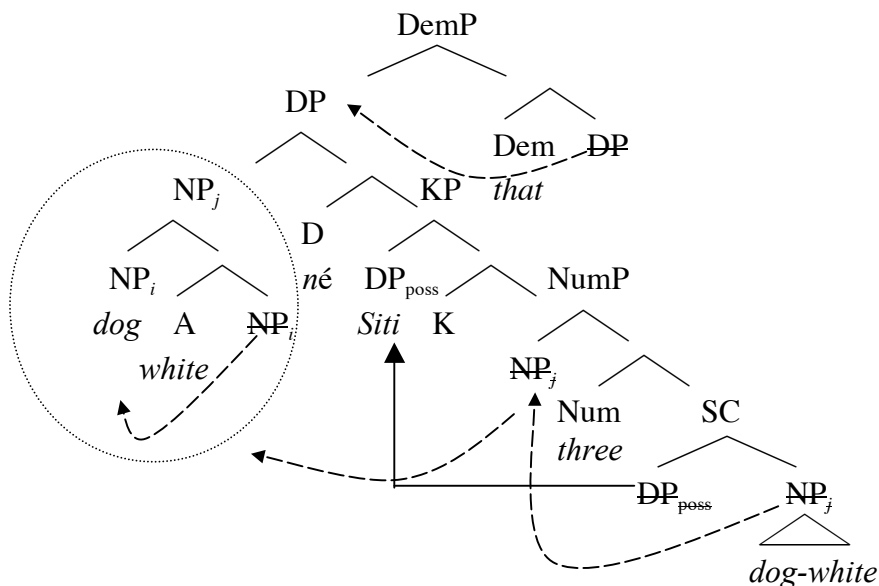
As we have seen, the D -né also occurs in the postnominal “possessive” construction:

- (26) *Aku seneng kranjang antik -né Siti.*
 I like basket old -né Siti
 ‘I like {Siti’s old basket / some old basket of Siti’s}.’

As shown in the above translation, this possessor marker D does not lead to the definiteness of the entire DP.

Turning to the structure of the possession, the question is where the possessor is merged. Possessors in DPs are known to show properties similar to subjects in clauses, and this leads to the hypothesis that the possessor DP is merged with the possessed NP or AP as the subject of a small clause [_{SC} DP NP]. As a starting point, let us adopt Kayne’s structure for possession to begin with: he proposes that the possessor DP moves to Spec,KP to receive case, and the specifier of the KP would be the spell-out position of the Possessor DP (see the tree (27) below). There is some empirical evidence that allows us to decide the position of the possessor. First, the possessor DP is pronounced immediately after the D -né. Second, for the first and the second person possessors, -né is not used, but the suffix -ku, which can be taken as a fused form of -né and the first possessor pronoun and -mu, which can be taken as a fused form of -né and the second possessor pronoun, are used respectively (e.g., *méja-ku* ‘my table’, *méja-mu* ‘your table’). Assuming the fusion requires proximity at the syntax-PF interface, this is another piece of evidence that the D -né and the possessor end up being adjacent. Third, numerals are pronounced immediately after the possessor DP (the surface order is [NP-né Possessor Num]), indicating that numerals are also structurally adjacent to the possessor at PF. Since the universal hierarchy of the functional projections is Dem>D>Num, the only possible position for the possessor at the spell-out is between the D -né and the Num, resulting in the following structure.

(27) The derivation of the order [N-A-né-Possessor-Num-Dem]

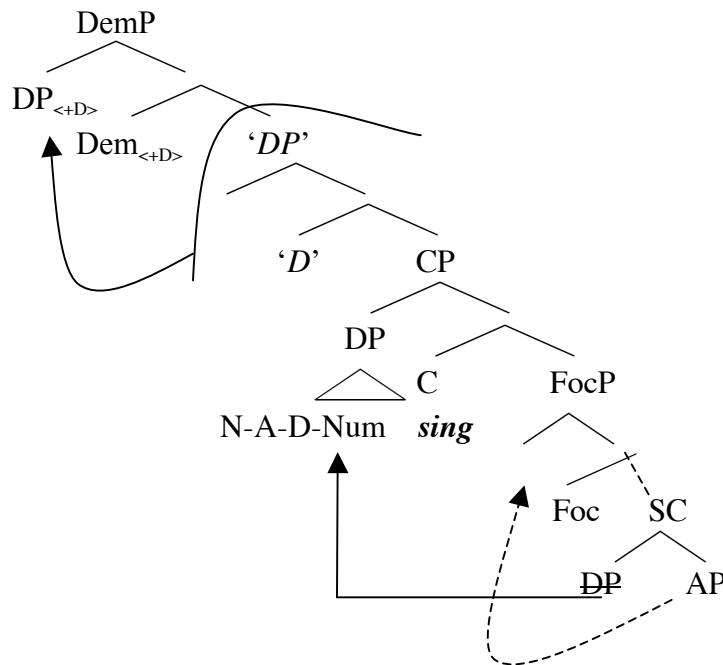


The derivation involves forming a possessor small clause by merging a possessor DP and the possessed NP. The possessor moves to Spec,K to get case and the roll-up derivation proposed earlier then moves the possessed NP_i to Spec,NumP and then to Spec,DP, stranding the Num (due to the complexity filter on the D —pied-piping Num makes the constituent too big), and finally the rolled-up constituent satisfies the nominal EPP of the D, yielding the desired linear order [N-A-né-Poss-Num-Dem].

3.6. Restrictive and non-restrictive *sing* RCs

This section is solely concerned with deriving the positions of restrictive and non-restrictive relatives. The syntactic assumption we rely on is the ‘promotion’ analysis proposed by Kayne (1994:87), where the relative CP is always introduced by the relative introducer D (silent ‘D’ in Javanese). Kayne (1994:112) argues that when an RC is in the scope of the ‘D’, it gives rise to a restrictive reading, whereas when an RC is not, the reading is non-restrictive. Since a *sing* relative clause is used as a focus device, this leads us to hypothesize that there is a focus projection inside the relative clause, which gives rise to a focus interpretation. The proposed analysis for the restrictive relative clause that includes a focused adjective is presented below:

(28) The derivation of a restrictive RC: [[DP-*sing* RC]- Dem]

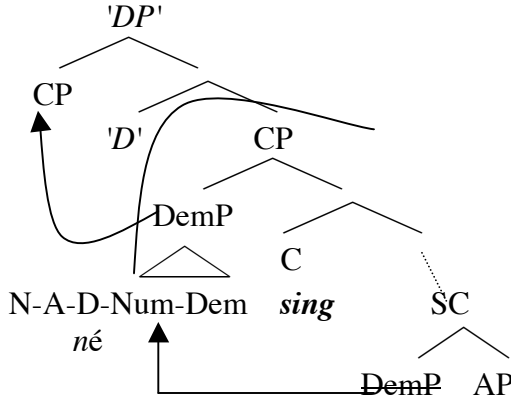


The derivation involves forming a small clause by merging a subject DP with a predicate AP, which is generated with the feature <+FOC>. Then the Focus projection is merged. The EPP feature of the Foc requires its specifier to be filled with an XP that has the feature <+FOC>; thus the AP that has the feature <+FOC> moves to the Specifier of the Foc, satisfying the EPP of the Foc. Then the C, *sing*, is merged, and it promotes the

subject DP to its specifier. Note that this is part of the relativization process proposed by Kayne (1994)). Subsequently, the relative clause DP rolls up to Spec,DemP to locally satisfy the EPP feature of the Dem (this part of the derivation is the same as the process in the derivation presented in (11), *i.e.*, the Dem is always DP final). Consequently, the *sing* RC is in the scope of the silent D throughout the derivation, resulting in a restrictive interpretation.

The next question is how to account for the positioning of the non-restrictive RC given the derivations we have established so far. The basic idea is that what is promoted from the relative clause is an internally merged DemP DemP, which can subsequently move out of the scope of the ‘D’ to avoid receiving a restrictive interpretation. The proposed structure and the derivation of the non-restrictive RC are illustrated below:

(29) The derivation of a non-restrictive RC:



The derivation involves forming a small clause by merging a subject DemP with a predicate AP. Then C *sing* is merged and it promotes the DemP to Spec,CP. Then relative CP rolls up to the Spec of the ‘DP’ in order to move the relative CP out of the scope of the ‘D’, yielding the desired surface order N-A-D-Num-Dem-*sing* RC.¹⁶

4. Concluding remarks

This paper has established the linear order of the postnominal constituents inside the DP in Japanese, *i.e.* [NP-A-D-(possessor) -Num-(RC)-Dem-(RC)], and showed that the order is quite rigid once the interpretation is taken into consideration. Based on the derivational

¹⁶ Note that this derivation of the non-restrictive RC would predict an ambiguity between restrictive and non-restrictive readings due to the reconstruction effect. Before the relative CP moves up to Spec,DP, the relative CP was inside the scope of the ‘D’ (see Ishizuka 2008 for such a phenomenon in Japanese). Whether the string N-(A)-(D)-(Num)-Dem-RC in Japanese has such an ambiguity or not has not been tested yet, and I will leave this issue for future research.

theory proposed by Cinque (2005), the paper derives the surface order from the universal hierarchical order $\boxed{\text{Dem} > \text{D} > \text{Num} > \text{Adj} > \text{N}}$ by the combination of two types of phrasal movement, pied-piping and specifier extraction. The unmarked movement in Javanese is pied-piping, but there seems to be a complexity filter on the D (cf. Koopman and Szabolcsi 2000, Koopman 2002) that determines the ‘size’ or internal complexity of the constituent that can occupy Spec,DP. The complexity filter plays a crucial role in explaining some distributional properties of adjectives, such as the restrictions on recursion of bare adjectives (maximum two) and the inability to use structurally high adjectives (e.g., ‘subject comment’) attributively.

There are many issues we could not discuss in this preliminary analysis of the Javanese DP, and this paper is just a starting point for further exploration, but I hope that it will contribute to our further understanding of the universal properties and the internal structures of the DP.

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