A simple solution to complex patterns inside the Madurese DP

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This paper looks at several complex patterns of elements inside the determiner phrase (DP) of Madurese from Davies and Dresser 2005, and proposes a theoretical addendum to their proposal, while keeping their insights. More specifically, instead of their attempt of deriving the patterns by head-movement of the noun (N), we propose that in addition to head-movement of the N, Madurese also systematically allows phrasal movement of the NP. We illustrate that this proposal, together with Davies & Dresser’s insights, can account for all the complex patterns, including the patterns that Davies and Dresser acknowledged to remain problematic in their analysis.

1. Introduction

This paper investigates the possible patterns inside a determiner phrase (DP) in Madurese, and how such patterns can be analyzed in a formal Generative framework. The internal elements that constitute a DP in Madurese are known to display quite flexible word order (cf. Davies and Dresser 2005, D&D henceforth), and thus it has been noted by D&D that such array of possibilities in terms of word order of these elements makes it hard to have a coherent analysis. Nonetheless, D&D take on the task, and sketch an analysis based on head-movement of the N(oun). While their analysis can account for several attested patterns, they themselves acknowledge that the rest of the patterns are left unexplained. The goal of this paper is to provide an account for these unexplained patterns as well as the ones that D&D can account for. In other words, this paper puts forward an analysis that can account for all the attested patterns in the Madurese DP in a straightforward and uniform way. The main proposal is that in addition to head-movement of N as suggested by D&D, Madurese also utilizes a strategy of phrasal movement of the NP. The paper shows that with this proposal, we can not only account for all the attested patterns in the Madurese DP in a straightforward and uniform way. The main proposal is that in addition to head-movement of N as suggested by D&D, Madurese also utilizes a strategy of phrasal movement of the NP. The paper shows that with this proposal, we can not only account for all the attested patterns, but we can also retain D&D’s general and valuable insights. The paper further suggests that both these movements occur, in fact, driven by the same motivation, namely to satisfy features of definiteness and deixis. This property makes Madurese an interesting language as cross-linguistically there is evidence of definiteness triggering head-movement in some languages (e.g Romance, see Longobardi 1994) and phrasal movement in other languages (e.g Bangla, see Dayal 2012, Syed 2017, among others) – Madurese seems to provide evidence where definiteness can act as a trigger for both types of movement in a single language.

The paper is organized as follows: Section 1.1 provides a brief note on methodology; Section 2 reports the relevant attested patterns permitted inside the Madurese DP; Section 3 sketches the analysis provided in D&D, and discusses how such an analysis fails to derive most of the attested patterns; Section 4 presents the main proposal of this paper, and illustrates with sample derivations how the analysis proposed can account for all the patterns permitted in the Madurese DP; Section 5 discusses an alternative proposal in terms of excorporation and

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provides arguments against it; Section 6 concludes the paper with a discussion of outstanding issues.

1.1 Methodology

Most of the Madurese data in this paper is taken from D&D, with the exception of (4) and (30)-(33). Examples (30)-(33) are taken from Davies (2010), and example (4) is collected from our consultant, who is a Madurese native speaker brought up in West Kalimantan. Our consultant’s parents moved to West Kalimantan from the island of Madura and are speakers of the Bangkalan dialect of Madurese. Our consultant spoke Madurese at home as well as with his friends as he grew up in a Madurese neighborhood. He is University educated, and speaks Indonesian and Malay in addition to Madurese. All the examples taken from D&D are double checked with our consultant as well. The interactions with our consultant took place in Auckland, New Zealand, where he had moved for a Ph.D.

2. Data and patterns inside the Madurese DP

This section presents all the possible word-orders where the N(oun) appears in the left-most position among the elements that constitute the Madurese DP. The data and the patterns are reported in D&D, and they have been also found consistent with our Madurese consultant. The focus of the paper is the same as D&D’s - to account for the orders where N is the leftmost element. I will present the data in the following way: first I will present the relevant piece of data from D&D and describe it, and I schematize the data in the headings so we can later talk about the generalizations by using these schemas.

2.1 Pattern 1: N Num

In Madurese, the numeral (Num) can follow the head noun (N), as illustrated in (1) below.

(1) kanca tello’
    friend three
    ‘Three friends’

D&D (and also Davies 2010) note that the other order (where the NUM occurs before N) is also possible, and Davies (2010) reports that there is no semantic difference between these two orders2. As the focus of D&D as well as this paper is to account for all the orders where the N is the left-most element, we will not be putting forward a proposal to account for the order Num N, where N comes to the right of the Num3. We do, however, discuss some relevant data and possibilities in Section 6.

2.2 Pattern 2: N PP DEM

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2 Currently there is no evidence to claim which of these two orders is canonical.
3 Note that quantifiers behave the same way as numerals in Madurese. For the purpose of this paper, we will focus our discussion only on the numerals, but the descriptions for the numerals can be extended to the quantifiers as well.
A prepositional phrase PP can follow the head noun N in Madurese as shown in (2). Note that the Demonstrative (DEM) is positioned to the right of the PP.

(2) *kanaʼ dhari Kamal rowa*
   child from Kamal that
   ‘that child from Kamal’

2.3 Pattern 3: N DEM PP

Pattern 3 still involves a PP, a Dem and an N but attested in a different word order. As illustrated in (3), we see the N immediately followed by the Dem, while the PP ‘from Kamal’ follows the DEM. That is, in other words, the crucial difference between (2) and (3) is the alternating positions of the Dem and the PP: the DEM follows the PP in (2), while the PP follows the DEM in (3).

(3) *kanaʼ rowa⁴ dhari Kamal⁵*
   child that from Kamal
   ‘that child from Kamal’

2.4 Pattern 4: N-DEF POSS ADJ

Now let’s look at constructions that involve a Possessor (POSS) and an adjective (ADJ) inside the DP. As illustrated in the bracketed part in (4) below, the head noun *cat* is followed by the POSS John, and the POSS is followed by the ADJ *brown*. Note that in a possessor construction like (4), the N is marked with the definite marker *nga*. In addition to *nga*, the definite marker has several other allomorphs: *na, a, sa*, and according to Davies (2010), the form -*na* seems to be the default morpheme, and the rest are phonologically assimilated (Davies 2010, page 109).

(4) *angko nokol [koceng-nga John soklat]*
   I hit cat-DEF John brown
   ‘I hit John’s brown cat’

Also note that the example in (4) is not from D&D (they give only a Javanese example of the same schema), and is collected from our Madurese consultant. The example is presented in a full sentence to show that *koceng-nga John soklat* ‘John’s brown cat’ is a DP occupying the object position of the sentence.

2.5 Pattern 5: N ADJ-DEF POSS

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⁴ Davies (2010) notes that ‘rowa’ is a distal demonstrative. There are two types of demonstratives in the language, proximal and distal. The proximal forms are *reya, areya, jareya, jariya, jiya, jajiya*, and *jeh*; the distal forms are *rowa, arowa*, and *juwa* (see Davies 2010, page 190).

⁵ D&D seem to state it is a general property of PPs that they can precede or follow the Demonstrative, giving rise to the alternation seen in (2) and (3). All the examples found in D&D regarding these nominal internal PPs are with the preposition *dhari ‘from’*, and we didn’t find examples with other prepositions in Davies (2010). As such, although D&D’s statement seem to be extended to PPs with other prepositions as well, we can neither confirm nor deny this.
Pattern 5 reports another alternation, this time between the order of POSS and ADJ. In contrast to (4) where the ADJ follows the POSS, the POSS *John* follows the ADJ *brown* in (5). Also note that the DEF-marker that was marked on the N in (4) now appears on the ADJ in (5).

(5)  
\begin{align*}
\text{koceng} & \quad \text{soklat-a} & \quad \text{John} \\
\text{cat} & \quad \text{brown-DEF} & \quad \text{John} \\
& \quad \text{‘John’s brown cat’}
\end{align*}

2.6 Pattern 6: N ADJ1 ADJ2-DEF POSS

Pattern 6 is also a possessive construction, but it involves two adjectives instead of one. It’s noted that when two adjectives are present the DEF-marker shows up on the second Adjective (ADJ2). This is illustrated in (6) below.

(6)  
\begin{align*}
\text{koceng} & \quad \text{celleng} & \quad \text{koro-sa} & \quad \text{Atin} \\
\text{cat} & \quad \text{black} & \quad \text{skinny-DEF} & \quad \text{Atin} \\
& \quad \text{‘Atin’s skinny black cat’}
\end{align*}

2.7 Pattern 7: N-DEF POSS ADJ1 ADJ2

In (7), the ingredients of the DP are the same as (6), but the order is different: the N is followed by the POSS, which is then followed by the two adjectives. The DEF-marker appears on the N in (7) instead of ADJ-2 as seen in (6).

(7)  
\begin{align*}
\text{koceng-nga} & \quad \text{Atin} & \quad \text{celleng} & \quad \text{koro} \\
\text{cat-DEF} & \quad \text{Atin} & \quad \text{black} & \quad \text{skinny} \\
& \quad \text{‘Atin’s skinny black cat’}
\end{align*}

I have now presented seven patterns that are reported in D&D as possible arrangements of elements within the Madurese DP. These patterns are summarized as schemas in the table below.

<table>
<thead>
<tr>
<th>Table 1. Summary of attested patterns inside Madurese DP</th>
</tr>
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<tbody>
<tr>
<td>1 N Num</td>
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<tr>
<td>3 N DEM PP</td>
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There are two things of particular importance: first, the observation that N appears at the leftmost position of the DP with the other elements, in whatever order, following it. Secondly, there is an alternation of positions of different elements with respect to each other. In (2) and (3) this alternation is between the PP and the DEM: while the DEM follows the PP in (2), it precedes the PP in (3). In (4) and (5), the alternation is between the ADJ and the POSS: the ADJ follows the POSS in (4) while the ADJ precedes the POSS in (5). The same

\[\text{Note again that numerals, however, can occur on both sides of the N in Madurese. We discuss this in Section 6.}\]
alternation is observed with multiple adjectives in (6) and (7): the POSS follows both the adjectives in (6), while both the adjectives follow the POSS in (7). Any analysis of the Madurese DP must account for these observed facts. In the next section, we evaluate D&D’s analysis and how it fares with this task.

3. Analysis: D&D

First, recall that the patterns presented so far have the N as the left-most element of the DP. As D&D note, this leftmost position is the most usual position for the N in Madurese, and D&D’s analysis that we will sketch below only tries to capture these orders where N is the left-most element. First, D&D assume that underlingly the N is in a position structurally lower than elements like possessors and demonstratives. This is in contrast to what we see on the surface, where the N seems to be at the highest position. To account for this surface position of N, D&D propose that the head N moves from its original position to a higher position D, which is its surface position. As mentioned by D&D, this kind of movement is quite common cross-linguistically, and is known as N-to-D movement (cf. Ritter 1991, Longobardi 1994, Bernstein 1997), and is evoked by D&D to account for the left-most position of N in Madurese. The details and the motivation for the movement are briefly described below.

In D&D’s analysis the functional projections within the Madurese DP are DP, POSSP, DEMP and NP, and they suggest that NP in its base-position (i.e in the D-structure) is syntactically the lowest projection. The hierarchy of elements proposed in D&D is:

(8) DP > POSSP > DEMP > NP (where ‘>’ is read as ‘higher than’)

Given this hierarchy, to derive the left-most position of the N, D&D suggest that there is head-movement of N from inside the NP to the head of the D, as schematized below:

(9) \([\text{DP N-DEF [NP N]}]\]

Let’s illustrate this with a real example. Consider (10) below, where on the surface the N is attached to the definite marker, followed by the possessor ‘John’.

(10) \textit{koceng-nga} \ John  
cat-DEF \ John  
‘John’s cat’.

The underlying syntactic structure of (10), according to D&D’s proposal would be (11). The definite marker \textit{nga} is generated as the D-head, and ‘John’ is generated in the Spec,PossP where the head \textit{Poss} is empty/null. The NP is the lowest projection which hosts the N-head \textit{koceng}.

(11) \([\text{DP -nga [PossP John Poss [NP koceng]}]\]

A transformational rule of N-D movement applies to (11), moving the N-head \textit{koceng} to the D-head (via the null Poss head), deriving the surface order of (10). This is illustrated below in (12).

(12) \([\text{DP koceng-nga [PossP John Poss [NP koceng]}]\]

\[\text{Diagram}\]
As any movement in a syntactic theory must be motivated empirically, D&D suggest that the motivation for this head-movement of N-D is to get close to the definite marker -DEF, so that the N can be marked with -DEF. In other words, definiteness is what triggers this movement in Madurese, as is quite commonly argued in other languages (cf. Ritter 1991, Longobardi 1994). This is how D&D’s analysis accounts for the left-most surface order of the N in most cases.

Another pertinent point to highlight about D&D’s analysis is their take on adjectives in Madurese. Recall that ADJ follows the N in Madurese. In D&D’s account this N>ADJ order does not arise from N-movement, but rather because of right adjunction of the adjective. That is, an ADJ is adjoined to the right giving the order [N ADJ]. In addition, D&D make an assumption: that despite the adjunction of the adjective, the N and the ADJ now together form the head. They take this assumption to be necessary as in their head-movement account, the only way to explain an order where the -DEF marker appears on the ADJ, like N ADJ-DEF, is by movement of the complex head [N ADJ] to adjoin to the -DEF marker. This is illustrated in (13).

(13) Underlying/D-Structure: DEF [complex head N-ADJ]

S-Structure: [complex head N-ADJ]-DEF [complex head N-ADJ]

Before we evaluate D&D’s analysis, let’s recall the task in hand: any formal analysis should be able to account for (a) the left-most positioning of the N, and (b) all the different attested orders and alternations that we have seen in (1)-(7). D&D’s analysis, in terms of (complex) head-movement of N, does provide an answer to (a), but with respect to (b), it fails to capture most of the attested patterns. The biggest problem to this account is what D&D themselves acknowledge – they cannot derive the alternating orders of DEM and PP (patterns 2 and 3). D&D suggest that DemP is higher than NP, which means the demonstrative DEM is underlyingly higher than the N. Assuming that DEM is the head of DemP and that DemP is higher than PP and the NP, the N can undergo head-movement to the DEM-head, and thus the order in 2 (N DEM PP) can be derived, as schematized below.

(14) N DEM [NP N PP]

However, as D&D acknowledge, such a head movement will not have any explanation for the order in (3) [N PP DEM]: because every time the N undergoes head-movement, the order in (2) will be expected and the order in (3) will be predicted to not be possible. D&D put this under “residual issues” and say that the only way of explaining the order in (3) [N PP DEM] is by remnant movement of the NP in (14) which only contains the PP, as schematized below.

(15) [DP N [DemP [NP PP ]; DEM t1 ]]}

Such a remnant analysis opens up several problems (e.g D&D acknowledge that there seems to be no motivation for this movement), and as such, D&D discard this possibility, and leave the alternation between patterns 2 and 3 as an open issue. In addition to the point that such a
remnant movement seems to be unmotivated, we want to point out that another problem exists in terms of landing site in this remnant movement. For this movement to derive the right word order, it is necessary that the remnant movement of the NP containing only the PP in (14) lands in a position below the final position of N. To get this, D&D have to say that the head-movement of N adjoins the N to the D, and the remnant movement of the NP lands in the SpecDemP, as illustrated in (15). Note that this creates an issue in terms of the motivation for the head-movement of N as well. As discussed earlier, the motivation for N-D movement in D&D’s analysis is for the N to be close to the definite marker. However, there is no definite marker present in the examples corresponding to patterns 2 and 3, and yet D&D are forced to assume that N-D movement takes place – which is another issue that comes with the remnant analysis. We side with D&D that a remnant-movement analysis cannot be maintained, but at the same time we believe that D&D’s core insight that some kind of a phrasal movement is necessary to derive these patterns is valuable. We will argue in Section 4 that it is possible to use phrasal movement in a systematic way to derive all the patterns reported in D&D, and at the same time retaining D&D’s idea of N-D movement. But before laying out our analysis, we like to point out that in a way similar to the contrast between (2) and (3) as discussed above, D&D’s account cannot explain the alternating orders between ADJ and POSS as well (see the contrast between 4 and 5; and 6 and 7). Under D&D’s analysis, the N and the ADJ form a complex head, and is thus expected to move together. Thus, the order in (5) and (6) are predicted to be okay, but the order in (4) and (7), where the ADJ does not move with the N, are predicted to not be grammatical, contrary to empirical evidence. That is, in D&D’s analysis, every time there is an ADJ (or two ADJs), it is expected that the DEF-marker will always next to the ADJ because N ADJ (or N ADJ ADJ) will always move together by head-movement to the DEF-marker. This is clearly not the case in (4) and (7), where the DEF-marker sits next to the N and not next to the ADJ. In other words, D&D’s analysis wrongly predicts the patterns 4 and 7 (as well as 3) to not be attested.

4. Proposal

Now that we have discussed the shortcomings of the analysis proposed in D&D, we suggest a way in which we can capture all the empirical facts. We aim to retain D&D’s insights that adjectives are adjoined and also that there is some form of head-movement in Madurese - at the same time we argue that our account is able to provide an analysis for all the attested patterns presented in (1)-(7).

Similar to D&D, our analysis will be couched in the framework of X’-syntax. The core proposal that we want to advocate for is that regarding movement of material inside the DP, Madurese permits both head movement (of N) as well as phrasal movement (of the NP). We maintain, following D&D, that adjectives are right adjoined to the N – however, we do not agree that they form a complex head. We assume that the adjunction of the adjectives is at a phrasal level – where the N and ADJ together form the NP. This is illustrated below in (16), for koceng soklat / ‘brown cat’, where we follow the general structure of adjuncts in X’-syntax (for example, see Carnie 2012, page 176).
The important thing in (16) is that the ADJ is part of the NP, but not part of the N-head. One consequence of this is that when we see the adjective moving with the N, it is no longer a head-movement but rather a phrasal movement of the NP. Given this added possibility of phrasal movement, we argue that all the patterns in (1)-(7) can easily be accounted for, if one entertains the idea that in some cases it is only the head N moving, while in the other cases it is the entire NP. Before we present clear illustrations how this proposal derives all the patterns, we want to address the motivation for the movements first.

There are two movements in our proposal: N-movement and NP-movement. We suggest that the motivation for both head-movement and phrasal movement is the same in each case. That is, in abstract terms, let’s say there is a feature +X in a higher head Y that must be checked with an element with the same feature that must move close to Y for feature checking to happen. Let’s also say there is a projection NP down the tree that bears the same feature +X. In such a scenario, the proposal put forward in the paper is that Madurese allows two possibilities to satisfy the +X on Y: either NP moves to SpecYP, or N (which also has +X feature) moves and adjoins to Y. Each of the two strategies has been argued for convincingly in many languages – for example, head-movement (i.e movement of N) has been argued to take place to satisfy +definite feature in Romance (Longobardi 1994) and Hebrew (Ritter 1991). Phrasal movement (i.e movement of NP) on the other hand has also been argued to happen for the same reason – to satisfy +definite feature – in languages like Bangla (e.g Dayal 2012, Chacón 2012, Syed 2017). This NP-movement is briefly described below. In Bangla, the canonical order of elements inside the DP is Numeral > Classifier > Adjective > N, where the adjective and the N together forms the NP (see 17). Note that this order of elements in (17) yields an indefinite interpretation ‘two red books,’ and to achieve a definite interpretation ‘the two red books’, the order in Bangla has to be [NP lal boi] > Num > Cl, as shown in (18). This alternation between (17) and (18) in order to encode a definite interpretation has been analysed in terms of NP-movement from its base position to SpecDP (see Chacón 2012, Dayal 2012).  

Interested readers are further referred to Syed 2016, 2017 for a discussion on how this movement triggered by definiteness is associated with different flavors of definiteness like deixis, identifiability, and inclusiveness.
That is, there is cross-linguistic evidence that a language can employ N-movement (Romance) or NP-movement (Bangla) to satisfy the same motivation – some definiteness feature (+DEF) on the D-head. In addition to the +DEF feature that can trigger movement, we suggest that the DEM-head/DEM\(^0\) has the feature +DEIX (deixis) which can also trigger movement. Following Lyons (1999), we take the working definition of ‘deixis’ to be ‘a spatial or temporal location relative to the speaker.’ Demonstratives in Madurese have similar deictic properties, and are described in Davies (2010) as “deictic elements that identify the location of a particular entity or entities with respect to a particular discourse context”. Cross-linguistically, demonstratives are associated with the +DEIX feature, and we adopt a syntactic model where the demonstrative DEM is generated in the head of the functional projection DemP, and the DEM is marked with +DEIX. Recall now the underlying hierarchy of elements proposed in D&D given in (8), and repeated below as (20):

\[(20) \text{DP} > \text{PossP} > \text{DemP} > \text{NP} \quad \text{(where ‘>’ is read as ‘higher than’)}\]

When only a DEM is present with the N, as in *kana’ rowa* / ‘that child’, only DemP and NP are present in the structure, and no DP or PossP. In this case, the only relevant feature that can trigger movement is +DEIX associated with the DEM. When a DP is present, it comes with the definite marker. When a possessor is present, the definite marker also obligatorily appears, the only exception being the first person possessor (see Davies 2010, page 194). This suggests that every time there is a (non-first-person) possessor, both the projections of DP and PossP are present, and any movement is triggered by the +DEF.

Below, we illustrate some concrete cases how the empirical patterns are derived. First, we suggest that there are several components possible for a Madurese NP. For example, a Madurese NP can be created by combination of: (i) N ADJ (ii) N ADJ1 ADJ2 and (iii) N PP. The possibilities in (i) and (ii) are formed by right adjunction of adjective(s), and the possibility in (iii) is created when the head N takes PP as its complement. With these background details, let’s look at some derivations.

### 4.1 Sample Derivation 1: Deriving Patterns 2 and 3

Let’s consider a derivation where the head N takes a PP as its complement. Thus the NP consists of N PP. Following the hierarchy of elements given in (20), the DEM is merged to this NP, creating a DemP that takes NP as its complement:

\[(21) \text{DemP} \rightarrow \text{[Dem’ DEM [NP N PP]]}]\]
The head of the DemP, DEM, comes with the +DEIX feature that requires movement of material to satisfy it. I suggest that there are two possible ways of satisfying this requirement: NP-movement or N-movement. When the NP moves to satisfy the +DEIX feature, we get the order [N PP DEM], which is the order that we see in pattern 2. This is illustrated below in (22), where the NP moves to the Spec,DemP.

(22) \[\text{[DemP} \quad \text{[Dem'} \quad \text{DEM} \quad \text{[NP N PP]]}\] Underlying Order

\[\text{[DemP [NP N PP] \quad [Dem'} \quad \text{DEM [NP N PP]]}\] NP-movement, deriving pattern 2

On the other hand, when the N moves to satisfy the +DEIX, the surface order becomes [N DEM PP] as illustrated below. This is head-movement of the N, which adjoins to the DEM, creating the order that we see as pattern 3. The alternation between the order of the DEM and the PP, which posed a problem for D&D, thus seems to have a straightforward account. This is shown in (23).

(23) DEM [NP N PP] Underlying Order

\[\text{[DemP} \quad \text{[Dem'} \quad \text{DEM [NP N PP]}\] N-movement, deriving pattern 3

4.2 Sample Derivation 2: Deriving Patterns 4 and 5

Now let’s consider a derivation where the NP is formed by right adjunction of an adjective. That is, the NP consists of [N ADJ] in this scenario. Then the PossP is merged, where the possessor occupies the Spec,PossP and the head Poss⁰ is phonologically null. I will use the notation POSS for the actual possessor, and Poss⁰ for the null head. This PossP looks like: [PossP POSS [Poss’ Poss⁰ [NP N ADJ]]]. Next, the DP is merged, where the definite marker occupies the head D position. This definiteness marker comes with a definiteness feature, and must trigger movement of material to satisfy said feature. In a similar way to the previous sample derivation, there are two possible ways of satisfying the definiteness feature: NP-movement or N-movement. When NP-movement takes place to the SpecDP, the surface order [N ADJ-DEF POSS ADJ] is derived (which is pattern 5). This is illustrated below.

(24) Underlying Order

\[\text{[DP} \quad \text{[D’ DEF-marker [POSSP POSS [NP N ADJ]]]}}\] +DEF

NP-movement, deriving Pattern 5

\[\text{[DP [NP N ADJ] [D’ DEF-marker [POSSP POSS [Poss’ Poss⁰ [NP N ADJ]]]]}}\] +DEF
If N-movement happens to satisfy the definiteness feature, then the final order that is derived is [N-DEF POSS ADJ], which is the order seen in pattern 4. This is illustrated below, where there is N-D movement via the (null) Poss$^0$.

4.3 Sample Derivation 3: Deriving Patterns 6 and 7

Now let’s consider a derivation with multiple adjectives. The NP in such a scenario is formed of [N ADJ1 ADJ2]. The PossP gets merged and consists of [Poss POSS [Poss’ Poss$^0$ [NP N ADJ1 ADJ2]]]. The DP is merged next, giving rise to the following underlying order:

\[(DP \{\text{DP} \{D' - \text{DEF-marker} \{\text{POSS POSS} \{\text{Poss' Poss}^0 \{\text{NP N ADJ1 ADJ2}\}\}\}\}\}\}\]\n
The definite marker has a definiteness feature that must trigger movement. Again, there are two possible ways of satisfying the feature: NP-movement to Spec,DP or N-movement. When the NP moves, the surface order generated is [N-DEF POSS ADJ1 ADJ2 POSS], which is seen in pattern 6. The derivation is illustrated below.

(27)

\[\text{Underlying Order} \]
\[\{\text{DP} \{\text{DP} \{D' - \text{DEF-marker} \{\text{POSS POSS} \{\text{Poss' Poss}^0 \{\text{NP N ADJ1 ADJ2}\}\}\}\}\}\}\]\n
NP-movement, deriving pattern 6
\[\{\text{DP} \{\text{NP N ADJ1 ADJ2} \{D' - \text{DEF-marker} \{\text{POSS POSS} \{\text{Poss' Poss}^0 \{\text{NP N ADJ1 ADJ2}\}\}\}\}\}\}\]\n
If the N moves to satisfy the definiteness feature, then the surface order becomes [N-DEF POSS ADJ1 ADJ2], by head movement of N to D, via the null Poss$^0$. This N-D movement results in the order seen in pattern 7. The derivation is shown below.

(28)

\[\text{Underlying Order} \]
\[\{\text{DP} \{\text{DP} \{D' - \text{DEF-marker} \{\text{POSS POSS} \{\text{Poss' Poss}^0 \{\text{NP N ADJ1 ADJ2}\}\}\}\}\}\}\]\n
Once again, the alternation between the order of POSS and ADJ seen in pattern 4 and 5 is easily captured in our analysis, which otherwise did not have an explanation.
In all the three sample derivations, there are two important things. First, there is either definiteness or deixis feature that induces movement and second, there are two possible movements to satisfy the same feature: NP-movement or N-movement. We argue that such a simple idea, namely by allowing both head as well as phrasal movement to satisfy the same feature, is what Madurese employs. This gives a straightforward and neat answer to how all the apparently complex patterns are generated within the Madurese DP.

5. Against an alternative proposal: ruling out excorporation

An anonymous reviewer has suggested that the patterns described here can be explained by an alternative proposal: an analysis based on optional excorporation. Let’s illustrate how such an analysis may capture the alternations in the patterns 4 and 5. Recall the alternation: in (4) the ADJ is at the end (N-DEF POSS ADJ), whereas in (5) the ADJ is adjacent to the definite marker and at the beginning along with the noun (N ADJ DEF POSS). This alternation was a problem in D&D’s original proposal, and was captured in this paper by N-movement and NP-movement as illustrated in (24) and (25). In an excorporation analysis, this alternation can be explained in the following way. First, such an analysis retains D&D’s idea that N and ADJ together form a complex head. That is, the underlying order is:

\[(29) \quad [\text{DP} [\text{D'-DEF-marker} \quad [\text{POSS} \quad [\text{Poss'} \quad [\text{Poss}^0 \quad [\text{NP} \quad [\text{N} \quad [\text{ADJ} \, \text{ADJ2]}]]]]]]]]

Complex head

From the underlying order in (29), an excorporation analysis will allow only part of the complex head to undergo further head-movement. In addition, such an analysis has to say that excorporation (i.e. part of the complex head undergoing movement) is optional as head-movement can target the entire complex head as well. Thus, in this analysis when only part of the complex head, N to be precise, undergoes head-movement, the order in (4) is derived, as illustrated below in (30). When the entire complex head undergoes head-movement, the order in (5) is derived, as illustrated in (31).

\[(30) \quad [\text{DP} [\text{D'-DEF-marker} \quad [\text{POSS} \quad [\text{Poss'} \quad [\text{Poss}^0 \quad [\text{NP} \quad [\text{N} \quad [\text{ADJ} \, \text{ADJ2]}]]]]]]]]

Complex head

\[(31) \quad [\text{DP} [\text{D-DEF-marker} \quad [\text{POSS} \quad [\text{Poss'} \quad [\text{Poss}^0 \quad [\text{NP} \quad [\text{N} \quad [\text{ADJ} \, \text{ADJ2]}]]]]]]]]

Complex head

Although such an analysis in terms of optional excorporation can derive the alternating patterns in (4) vs (5) and also (6) vs (7) (potentially (2) vs (3) as well with the added
assumption that N and DEM can form a complex head), we advocate against it for three main reasons.

First, as mentioned earlier, such an analysis retains the idea that N and ADJ together form a complex head. This is a problematic idea, and as an excorporation analysis has to rely on this assumption, the analysis itself becomes problematic as well. Cross-linguistically, adjectives are treated as modifiers/adjuncts and there are two common ways of analysing adjectives in the syntax: (a) adjectives adjoined at a phrasal level as assumed in this paper, i.e. adjectives are part of AdjP, which either occupies some specifier slot of NP (cf. Ritter 1992, Boskovic 2005 among others) or is adjoined at N’ (Carnie 2012, among others), or (b) adjectives in the specifier positions of designated functional projections (Cinque 2010, Scott 2002, among others). Regardless of the two potential ways of analyzing adjectives, what is important to acknowledge is that adjectives are unanimously treated as phrasal in nature, and pursuing an analysis where adjectives form a complex head with a noun seems to be on the wrong track.

Secondly, an excorporation analysis is understood to be in place when there is an already ongoing head-movement. That is, if a head X first moves to the next head Y, it’s not the complex head X-Y that moves further up, but just the head X (see Baker 1988, Rizzi and Roberts 1989). In other words, the head X seems to be passing through some higher heads without picking up any affixes from these heads. If an excorporation analysis has to be applied here for the Madurese data, it would seem that some head movement had to be already taking place – this seems to be not the case. For an excorporation based analysis to work, it is necessary to assume that the complex head (from which excorporation will take place) is formed not by an ongoing movement, but by assuming that two heads are merged together (e.g. N ADJ, and N DEM). This goes against the essence of the idea of excorporation – giving more reasons to not pursue an excorporation analysis for the Madurese data.

Thirdly, excorporation is known to not apply in all complex heads, and there are certain constraints that decide where excorporation may take place out of a complex head (e.g. clitic climbing) and where excorporation cannot occur (standard cases of noun incorporation, V-T movement, see Roberts 1991 for more discussion). The general understanding of where excorporation is impossible are “cases where incorporation results in a visible amalgam of the two heads” (Roberts 1991). As discussed earlier, if an excorporation based analysis is adopted for the Madurese patterns, it is necessary to treat [N ADJ] and [N DEM] as complex heads from which excorporation must be allowed. However, it is clear that in [N DEM] as well as in [N ADJ] both the heads are visible, and thus these are typical cases where excorporation is understood to may never be possible. All of these suggest that the patterns described in this paper should not be analyzed in an excorporation based account, and we believe that the proposal put forward in this paper, sketched in Section 4, is a simpler and a superior account.

6. Outstanding Issues

The three sample derivations illustrated in Section 4 account for the patterns (2)-(7) in a straightforward way. All these derivations involve movement triggered by some kind of features, deixis feature in (2) and (3) and definiteness feature in (4)-(5) and (6)-(7). The question remains how one can account for the order in pattern 1: [N NUM]. Note that the N appears to the left of the NUM in (1). Under the general cross-linguistic assumption that
NUM dominates N at an underlying level (see Cinque 2005), the left-most order of N must be derived from some kind of movement, either of N or NP. We will end this paper with a discussion on the possible nature of this movement, although it is beyond the scope of this paper to offer a full analysis for this alternation. That the left most order of N in [N NUM] is derived from some movement is clear because the underlying order where N is in the right is also attested in the language. This is illustrated in the contrast between (32) vs (33) and (34) vs (35).

(32) Sengko’ parlo [lema liter bensin].
   I need five liter gasoline
   ‘I need five liters of gasoline.’  (Davies 2010, pg 205, ex 108)

(33) Sengko’ parlo [bensin lema liter].
   I need gasoline five liter
   ‘I need five liters of gasoline.’  (Davies 2010, pg 205, ex 109)

(34) Dayat ma-tadha’ [tello pereng nase’ guring].
   Dayat AV.CS-not.exist three plate rice fry
   ‘Dayat ate three plates of fried rice.’  (Davies 2010, pg 206, ex 111)

(35) Dayat ma-tadha’ [nase’ guring tello pereng].
   Dayat AV.CS-not.exist rice fry three plate
   ‘Dayat ate three plates of fried rice.’  (Davies 2010, pg 206, ex 112)

In (32) and (34), the order between the NUM and the N inside the DP is [NUM N] whereas in (33) and (35) the order is [N NUM]. Adopting the idea that the NUM needs to (underlyingly) dominate the N, the order [NUM N] seems to be the underlying order, and the order [N NUM] is derived by movement. Regarding the question if this movement is N-movement or NP-movement, the contrast between (34) and (35) suggests an NP-movement as we see the noun and the adjective together (i.e an NP) undergoing movement. This is illustrated in (36) below.

(36) [NP nase’ guring] tello pereng [nase’ guring]

What might the motivation be for such a movement remains unclear. In a related language Javanese, it has been reported that the [N NUM] order must always give a count interpretation, whereas the [NUM N] order can have mass interpretation (see Ishizuka 2008).

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8 The words like liter ‘litre’ and pereng ‘plate’ in these examples are described in Davies (2010) as “appropriate units of measure” required for the types of noun used. This seems similar to the use of classifiers in many South-East Asian and South Asian languages.

9 It remains to be determined if an N-movement is also possible in addition to the NP-movement illustrated in (34), as the existing data was not conclusive. If N-movement is also possible, then the prediction will be that the language will allow an order where the ADJ is left behind, as in nase’ tello pereng guring. As the relevant data is not found in D&D nor in Davies 2010, and as we no longer have access to a native speaker at this point, this has to be left for future research.
This may suggest that like definiteness and deixis, countability features may also trigger movement in Javanese. However, such a contrast in count vs mass interpretations is absent in Madurese, as Davies (2010) notes that the [N NUM] and the [NUM N] orders as seen in (32)-(35) are “fully synonymous”. As such, countability cannot be a trigger for the movement illustrated in (36), but what actually drives this movement has to be left for further research.

We conclude this paper by bringing up another outstanding issue. While entertaining the idea that sometimes the N and sometimes the NP can move to satisfy the same requirement can straightforwardly account for all the patterns, a deeper technical question remains unanswered. Namely, how exactly does the mechanism work to be able to employ both strategies? For example, let’s consider the scenario where the +DEIX must be satisfied by movement of an element. A probe with +DEIX searches for a goal and finds an NP with the same features. This NP then undergoes phrasal movement. The N inside the NP also bears the same feature as the NP, but note that for the N to move instead of the NP, the system somehow needs to decide to not move the NP. To comment on how exactly this could be implemented in the system is beyond the scope of the current paper, but we would like to speculate that one possibility is that NP-movement is the default movement in the system, and if the system fails to move the NP for some reason, there is a back-up option of N-movement to prevent the derivation from crashing. This speculation is based on D&D’s observation that among the two possible orders in pattern 2 and 3, the order in 3 is preferred by native speakers, although there is no semantic difference. We have argued in this paper that the order in pattern 3 is derived by NP-movement, and D&D’s observation about the preferred order suggests that the NP-movement seems to be the default/preferred movement. This is still a speculation, and remains to be fully teased apart in future work. Note that this outstanding issue is not just an issue for the analysis proposed in the paper, but is equally outstanding for an alternative analysis like an excorporation-based account. In an excorporation based account, the excorporation of the N has to be optional, which will create the same issue for the system. As in, sometimes only the N has to move from the complex head, and sometimes the entire complex head has to move – the system has to somehow decide when to move what, an issue akin to the one described above.

In summary, the proposal put forward in this paper accounts for all the attested patterns in the Madurese DP by suggesting that DP-internal movements are triggered by certain features, and these movement requirements can be satisfied by either head-movement (of N) or phrasal movement (of NP). It is quite common to see languages employ either head-movement (e.g Romance) or phrasal movement (e.g Bangla) - Madurese seems to have the interesting and special property of employing both strategies to satisfy the same requirement.

**Abbreviations**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>ADJ</td>
<td>adjective</td>
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<tr>
<td>CL</td>
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<td>possessor</td>
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References


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