

Variation in the Co-occurrence of Indexical Elements: Evidence for Split Indexical Projections in DPs

Brian Hsu and Saurov Syed

1. Introduction

The DP hypothesis, which posits that nominal expressions are headed by a functional D(eterminer) Phrase (Abney 1987; Longobardi 1994; Szabolcsi 1994), has produced many insights into nominal syntax and semantics. This paper revisits two key claims of the standard DP hypothesis: first, that the DP projection is the surface position of articles and other determiners, and second, that it is the single structural position in which the referent(s) or the index of a nominal expression is specified (Longobardi 1994; Giusti 2015; Jenks *to appear*).

We first present a number of languages in which combinations of non-article determiners (demonstratives, proper names, pronouns, possessors) can co-occur in a single nominal phrase, and argue that these patterns provide new evidence that the functions of “DP” are in some languages distributed across an articulated series of functional projections (Julien 2005; Syed 2016, 2017; Cheng et al. 2017). In addition, we argue that languages share a universal hierarchy of features related to nominal reference and indexicality, but differ in the number of projections that they are mapped to, giving rise to cross-linguistic variation in permitted determiner co-occurrence patterns.

The paper is organized as follows. Section 2 presents a current view of DP structure and the types of determiner co-occurrence patterns that it predicts. Section 3 presents attested patterns of co-occurrence among non-article determiners as evidence for an articulated functional structure in the nominal left periphery. Section 4 presents the feature-bundling analysis of cross-linguistic variation in nominal structure, and Section 5 concludes the paper.

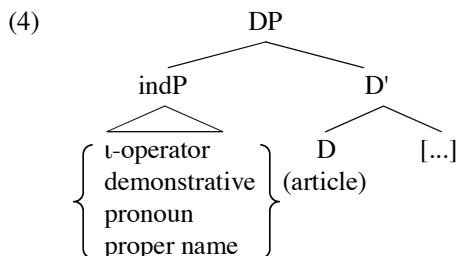
2. Determiner co-occurrence in a single DP structure

Prior research on determiner co-occurrence has primarily focused on language patterns where non-article determiners can or must co-occur with an article (Delsing 1998, Vangsnes 1999, Allen 2008, Giusti 2015), as in the following examples.

- | | | | | |
|-----|----------|-----|---------------|---|
| (1) | ez | a | fiú | demonstrative + article (<i>Hungarian</i> : Giusti 2015) |
| | this | the | boy | |
| (2) | Vosotros | los | profesores | pronoun + article (<i>Spanish</i> : Giusti 2015) |
| | you | the | professors | |
| (3) | Mett | the | stór | possessor + article (<i>Lappträsk</i> : Vangsnes 1999) |
| | my | the | big house-DEF | |

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Such patterns remain compatible with a non-articulated DP structure with a small set of assumptions. As a concrete example, consider Giusti's (2015) approach to nominal structure, based in part on a cross-linguistic study of the distribution of determiners. Giusti's proposal assumes a reprojection approach to nominal expressions (Georgi and Müller 2010), which can vary in number of functional projections present. Demonstratives, pronouns, and proper names are classified as indexical expressions (denoting "person, reference, or deixis"). Although these items can potentially be first Merged at different stages of the derivation, indexical items must move to the highest specifier position (cf. Longobardi 1994, Jenks *to appear*). Lastly, indefinite and definite articles do not themselves contribute to reference, but are simply pronunciations of functional heads within the nominal expression.



With these assumptions in place, cross-linguistic variation in the co-occurrence of articles with other determiners can be explained in terms of parameters on the pronunciation of functional projections; Each functional projection in a language is specified as to whether it requires the pronunciation of its head, its specifier, or both positions (cf. Vangsnes 1999; Giusti 2002; Julien 2005; Alexiadou et al. 2007). For example, complementary distribution between articles and demonstratives (ex. Italian) is generated by the OR parameter setting for demonstratives, while obligatory co-occurrence (ex. Hungarian) is generated by the BOTH setting.

(5) *Italian: OR parameter with demonstratives*

- | | | |
|----------------------------------|----------------------------|--|
| a. queste ragazze
these girls | b. le ragazze
the girls | c. *queste le ragazze
these the girls |
|----------------------------------|----------------------------|--|

(6) *Hungarian: BOTH parameter with demonstratives*

- | | |
|-----------------------------|------------------------|
| a. ez a fiú
this the boy | b. *ez fiú
this boy |
|-----------------------------|------------------------|

A key prediction of Giusti's approach is that co-occurrence among demonstratives, pronouns, and proper names within a single nominal expression should not be possible, as each of these are indexical items that compete to fill the highest nominal specifier position.¹ In the next section, we present several co-occurrence patterns with non-article determiners that falsify this prediction. On the basis of these patterns, we argue that a number of features commonly subsumed under "reference" or "indexicality" are in some languages distributed across separate functional projections, in an articulated DP structure.

3. Co-occurrence of non-article determiners

3.1. Proper names + (pronouns) + demonstratives

In previous works, restrictions against the co-occurrence of pronouns and demonstratives have been taken to argue that these elements occupy the same structural position. For example, Giusti (2015) takes the language sample in (7) to propose that nominal expressions admit at most one indP. On the basis of

¹ Giusti (2015) notes that co-occurrence between possessors and other non-article determiners is not excluded by this reasoning, because possessors bear a referential index distinct from that of the full nominal expression. As discussed in Section 4, however, accounting for restrictions on co-occurrence between possessors and other determiners creates new complications for the proposed parameter system.

the same restriction in Greek, Choi (2014) posits that demonstratives and adpositional pronouns are generated in the same functional projection.

- (7) a. *noi questi ragazzi *Italian*
 b. *nosotros estos chicos *Spanish*
 c. *noi acești băieți *Romanian*
 d. *we these boys *English*

As noted in the typological study of Höhn (2017), however, pronoun-demonstrative co-occurrence is attested in a wide range of languages outside of the Indo-European family.

- (8) dana ben eu age (Amele; Höhn 2017, after Roberts 1987)
 man big that 3.PL
 ‘Those leaders (big men)’

- (9) niya dathin-a danka-a (Kayardild; Höhn 2017, after Evans 1995)
 3.SG.NOM that-NOM man-NOM
 ‘Him, that man’

Here, we consider a somewhat more complex pattern in Mandarin Chinese, first discussed by Huang et al. (2009). Like Kayardild, Mandarin permits pronouns, demonstratives, and head nouns to occur in a fixed order (10). In addition, demonstratives can be preceded by a proper name (11), or by both a proper name and co-referent pronoun (12).

- (10) ni-men zhexie haizi (pronoun + demonstrative)
 2-PL these boys
 ‘You these boys’

- (11) Lisi nage tiancai (proper name + demonstrative)
 Lisi that genius
 ‘That genius Lisi’

- (12) Zhangsan ta zhege ren (proper name + pronoun + demonstrative)
 Zhangsan 3 this person
 ‘This person Zhangsan’

Huang et al. (2009) argue that proper name + pronoun sequences realize the specifier and head of the highest nominal projection. Specifically, they note that in the presence of a proper name, only the pronoun can be suffixed with plural marker *-men*, argued by Li (1999) to appear only on head positions. We can thus conclude that demonstratives instantiate a lower projection than pronouns or proper names.²

We propose following Höhn (2017) that in languages with pronoun-demonstrative co-occurrence, the syntactic features related to person and deixis are realized in separate nominal functional projections. The proposed structure of Mandarin (12) is shown in (13).

- (13) [_{FP}_{pers} Zhangsan [_{FP}_{pers} ta [_{FP}_{deix} zhege [_{FP}_{deix} [... [_{NP} ren] ...]]]]] (structure for Mandarin (12))

3.2. *Possessors + demonstratives*

Languages also vary in whether possessors can co-occur with demonstratives. Several examples of possessor-demonstrative co-occurrence are given below. Note that this co-occurrence pattern is attested

² Huang et al. (2009) propose that demonstratives in such structures are in NumP, below the proper name and pronoun in DP. However, it is possible for a number to follow the demonstrative, indicating that demonstratives remain in a functional projection above NumP.

both in languages without articles (ex. Mandarin, Bangla) and those with articles (ex. Fongbe, German, Malax Swedish), indicating that its availability reflects an independent parameter on nominal structure.

(14) amar oi lal boi (Bangla; Syed 2017)
 my that red book
 ‘That red book of mine’

(15) Wangwu zhexie hao xiaohai (Mandarin)
 Wangwu these good children
 ‘These good children of Wangwu’s’

(16) àsón nyè tòn éló ó lé (Fongbe; Lefebvre 2013)
 crab 1.SG GEN DEM DEF PL
 ‘these/those crabs of mine’

(17) dieses unser Land (German; Plank 1992)
 this our country
 ‘This country of ours’

(18) men anje hest-i (Malax Swedish; Vangsnes 1999)
 my this horse-DEF
 ‘This horse of mine’

Although possessors appear to pattern as adjectives in some languages (Bošković 2014), such an analysis is not possible for all of these cases. For example, Plank (1992) notes that the agreement paradigm on possessors in German resembles that of other determiners, but differs from that of adjectives. In Mandarin, possessors and adjectives have a different distribution; true possessors (not marked with ‘modificational’ or ‘relativizing’ *de*) must precede demonstratives, while adjectives must follow them (Y.-Y. Hsu 2013). This suggests that possessors and demonstratives in these structures are in separate projections.

Further evidence that possessors occupy a dedicated functional projection is found in possessor-linker constructions, in which both a non-pronominal possessor and a co-referent ‘linker’ pronoun precede the head noun possessee (19). In the Germanic languages that allow this structure, the pronoun inflects for case assigned to the full nominal expression, while case on the non-pronominal possessor is fixed (accusative or dative, depending on dialect). The agreement patterns support a specifier-head structure for the possessor-linker sequence (Delsing 1998; Strunk 2004).

(19) De’n Jung sien Vadder (Low Saxon; Strunk 2004)
 the.M.SG.ACC boy.M.SG.ACC his.M.SG.NOM father.M.SG.NOM
 ‘the boy’s father’

While the pattern appears to have eluded attention in previous work, a similar possessor-linker structure is available in Mandarin. Of key interest is the fact that the possessor and linker pronoun can precede demonstratives (21). Assuming that this possessor-linker sequence realizes a specifier-head structure, such examples indicate that in deixis is realized in a lower projection than possession in Mandarin (22).

(20) wo renshi [laoshi ta pengyou]
 I know teacher 3 friend
 ‘I know the teacher’s friend’

(21) wo renshi [laoshi ta zhexie pengyou]
 I know teacher 3 this.PL friend
 ‘I know these friends of the teacher’s’

(22) [_{FP_{poss}} *laoshi* [_{FP_{poss}} *ta* [_{FP_{deix}} *zhexie* [_{FP_{deix}} [... [_{NP} *pengyou*] ...]]]]] (structure for Mandarin (21))

Note that the structure resembles that of the proper noun-pronoun construction in (12). This observation is returned to in Section 4.

3.3. Components of definiteness: demonstratives and inclusiveness

A recent line of research has questioned the long-held assumption that “definiteness” has a single semantic characterization. Specifically, it has been shown that languages can use different morphemes or structures to distinguish “strong” definites, which refer to known entities in the discourse context, from “weak” definites, which refer to the maximum set of entities satisfying a domain restriction (Schwarz 2009; Syed 2016, 2017; Cheng et al. 2017; Jenks *to appear*; among others). Here, we adopt Lyons’ (1999) terminology, and refer to “strong” definites as marking *identifiability*, and “weak” definites as markers of *inclusiveness*, using the the following working definitions:³

(23) *Identifiability*

The speaker knows or is in a position to work out the referent of the noun phrase.

(24) *Inclusiveness*

Reference to the totality of the objects or mass in the context which satisfy the description.

In particular, Julien (2005), Syed (2016, 2017) and Cheng et al. (2017) argue that identifiability and inclusiveness can be marked in two distinct projections. Here, we present data from Bangla to show that determiners marking deixis and possession can be marked in a distinct projection from inclusiveness.

Consider the following contrast in Bangla, as discussed by Syed (2016, 2017). Nominal expressions with *numeral-classifier-adjective-noun* order receive an indefinite interpretation (25). Preposing of the adjective-noun sequence to the left of the numeral and classifier (26) has been noted to create a type of “definite” reading, though its exact characterization has been debated (Bhattacharya 1999; Chacón 2012; Dayal 2012; Syed 2017).

<p>(25) <i>du To lal boi</i> (“indefinite”) two CL red book ‘two red books’</p>	<p>(26) [<i>lal boi</i>]_i <i>du To t_i</i> (“definite”) red book two CL ‘the two red books’</p>
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Syed (2016, 2017) argues that an articulated DP structure is necessary to explain the observation that demonstratives are compatible with both the non-preposed order (27) and the preposed order (28). Given the intuition that demonstratives themselves introduce a definite interpretation, it appears that preposing and demonstratives indicate two different types of definiteness.

<p>(27) <i>oi du To [lal boi]</i> (“definite”) that two CL red book ‘those two red books’</p>	<p>(28) <i>oi [lal boi]_i du To t_i</i> (“definite”) that red book two CL ‘those two red books’</p>
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Specifically, a straightforward analysis is available if the two semantic components of “definiteness,” identifiability and inclusiveness, are realized in separate functional projections in Bangla. Demonstratives occupy a relatively high functional projection that instantiates the features of deixis and identifiability. Preposing of the adjective-noun sequence is generated by movement to the specifier of a lower functional projection that instantiates inclusiveness. This is shown in (29) below.

³ As discussed in more detail by Lyons (1999), identifiability corresponds to the the notion of familiarity (Heim 1982), while inclusiveness subsumes the notion of uniqueness/maximality (Kadmon 1990).

- (29) [_{FPdeix/iden} oi [_{FPinc} [lal boi]_i [_{NumP} du To t_i]]]
 that red book two CL
 ‘Those two red books’ (*inclusive*)

The semantic compositionality of this structure is illustrated by Dayal (2012) with the following example in the context of a flower shop. The preposed order (30b) suggests that there are *only two types* of red flowers (e.g. roses and carnations), a clear reading of inclusiveness. However, no such implication holds for (30c) – the speaker may be picking out roses and carnations from a larger set of red flowers.⁴

- (30) a. kon phul Ta Sundor?
 which flower CL beautiful
 ‘Which of the flowers are beautiful?’
- b. oi lal phul du To (*inclusive*)
 that red flower two CL
- c. oi du To lal phul (*non-inclusive*)
 that two CL red flower
 ‘Those two red flowers.’

Lastly, we note that it is possible for a possessor to precede both the demonstrative and preposed adjective-noun sequence (31). We thus have evidence for the presence of three functional projections in Bangla above NumP, which hosts numerals.⁵

- (31) amar oi [lal boi]_i du To ~~hal boi~~_i
 my that red book two CL
 ‘These two red books of mine’ (*inclusive*)

- (32) [_{FPposs} amar [_{FPdeix/iden} oi [_{FPinc} [lal boi]_i [_{NumP} du To t_i]]]]
 my that red book two CL
 ‘Those two red books of mine’ (*inclusive*)

3.4. Summary

To summarize the main generalizations of this section, it is clear that for certain pairs of features related to nominal reference, some languages can instantiate them on separate projections, while others cannot. Furthermore, determiner co-occurrence is subject to hierarchical ordering restrictions, some of which appear to be universal. In the next section, we address the question of which parameters determine cross-linguistic variation in permitted types of determiner co-occurrence, and argue that languages vary in the number of projections that are used to instantiate a universal set of features related to nominal reference.

4. Analysis

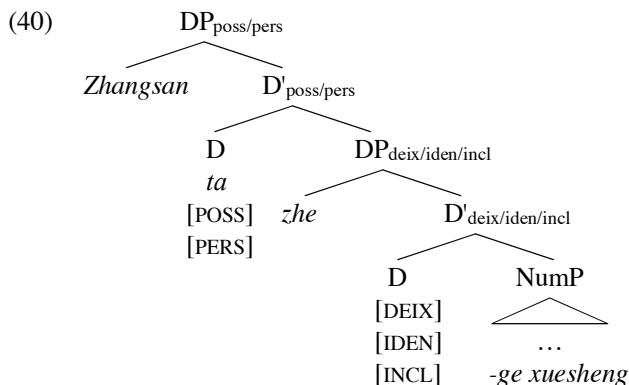
On the one hand, the claim that languages have a single DP projection to express all features related to nominal reference clearly does not provide enough structure to account for the attested determiner co-occurrence patterns. On the other hand, if a fully articulated series of projections is present in every

⁴ Dayal specifically proposes that preposing indicates maximality, which is equivalent to inclusiveness in Lyons’ (1999) terminology. The approach is framed contra Bhattacharya (1999), who posits a difference between a deictic reading in (25) and a specific reading in (26). For more detailed discussion, we refer the reader to Dayal (2012) for an alternative account of the pattern in a single DP structure, and to Syed (2017), who offers an explanation of Bhattacharya’s intuition about a deictic reading.

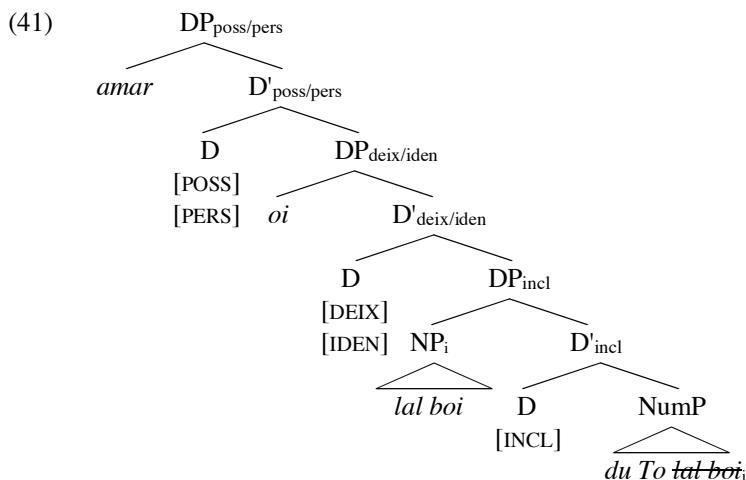
⁵ This projection is labelled as QP in Syed (2016, 2017).

- (39) * ta_j Zhangsan_i zhe-ge xuesheng_i
 he Zhangsan this-CL student
Intended: ‘This student of his, Zhangsan’

We propose that [POSS] and [PERS] are bundled on a single head in Mandarin, and that only one feature on this head can be active for interpretation and vocabulary insertion. Demonstratives, which instantiate [DEIX], are realized in a lower projection that also includes [IDEN] and [INCL].



Next, we turn to Bangla, which permits a somewhat more articulated structure. Recall that while demonstratives signal deixis and identifiability, inclusiveness is marked separately by NP movement to a post-demonstrative position. We propose that demonstratives occupy a projection that includes both [DEIX] and [IDEN] features. This dominates the projection that includes [INCL], which attracts the *adjective + noun* constituent to mark inclusiveness. The hierarchically highest nominal features, [POSS] and [PERS], are realized in the highest projection, which hosts possessors.



5. Conclusion

Although co-occurrence patterns among non-article determiners have received relatively little attention in nominal syntax, we have shown that they are highly informative about nominal functional structure and its cross-linguistic variation. Specifically, they provide new evidence that the subcomponents of “reference” and “indexicality” can be realized in separate functional projections (Schwarz 2009; Cheng et al. 2017), and shed further light on the hierarchical distribution of their corresponding formal features.

We end the paper by raising several questions that we hope can be addressed with further documentation of determiner co-occurrence patterns across languages. First, we note that demonstrative-

possessor co-occurrence patterns can in some cases depend on whether or not the possessor is pronominal. For example, in Mandarin a pronominal possessor can precede either a demonstrative or the head noun (45a). However, a non-pronominal (non *de*-marked) possessor cannot immediately precede the head noun, and requires an intervening demonstrative (45b), in an apparent case of obligatory co-occurrence.

- (45) a. Wo renshi ta (zhexie) pengyou
 I know 3 these friend
 'I know (these) friends of his.'
- b. Wo renshi Zhangsan/laoshi *(zhexie) pengyou
 I know Zhangsan/teacher these friend
 'I know these friends of Zhangsan's/the teacher's.'

In contrast, Plank (1992) notes that demonstrative-possessor co-occurrence in German is possible only with pronominal possessors, but not non-pronominal possessors.

- (46) a. dieses unser Land (German: Plank 1992)
 this our country
 'This country of ours'
- b. *diese Kanzler Kohls Rede
 this Chancellor Kohl's speech
Intended: 'This speech of Chancellor Kohl's'

In addition, although the orderings of demonstratives and possessors appear to be fixed in the languages that allow them to co-occur, languages vary in their hierarchical ordering. For instance, one finds both *demonstrative > possessor > noun* (ex. German) and *possessor > demonstrative > noun* (ex. Mandarin, Bangla) orders, suggesting that some word orders are derived by movement of possessors (Delsing 1998). Determiner co-occurrence patterns may thus help to more clearly identify the paths and featural triggers of possessor movement. Looking further afield, we similarly hope to identify whether there are connections between degrees of articulation and patterns of DP-internal A' movement (Horrocks and Stavrou 1987) or extraction out of DP (Szabolcsi 1994; Gavruseva 2000).

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