Blocking effects of higher numerals in Bangla: a phase-based analysis

1 Introduction

This squib explores a paradigm of blocking effects which occurs with phrasal movement taking place within nominal phrases in Bangla. We develop an argument that nominal constituents in Bangla project a mid-level QP phase below possessor phrases and demonstratives, which requires successive cyclic movement through its edge in order to satisfy the Phase Impenetrability Condition/PIC (Chomsky 2000). If a higher DP level of structure is also assumed to project as a phase in Bangla, this raises the possibility that the fully extended projection of noun phrases may contain two separate phases, in a way that resembles the occurrence of two phasal levels within clauses. The patterns reported in the squib also contribute to ongoing investigations into variation in the structural realization of numerals within nominal projections and how this may manifest itself in morphology and syntax with different kinds of effect (Franks 1994, Bailyn 2004, Shlonsky 2004, Matushansky 2006, Danon 2012).

2 A blocking effect on two patterns of movement within Bangla nominal phrases

In Bangla noun phrases, there is a fixed neutral order of lexical and functional elements, which only allows for certain alteration under special conditions of focus and definiteness licensing, shortly to be described. This ordering is represented in (1), and illustrated in (2). We take the regularized, neutral ordering of elements such as possessors, demonstratives, quantifiers and classifiers as evidence that these instantiate a range of functional categories projected above NP, which we explicitly label as in (3) (see also Bhattacharya 1999, Chacón 2012, Dayal 2012, and Syed, to appear).¹

(1)   Possessors  >  Demonstratives  >  Quantifiers  >  Classifiers  >  NP

(2)   amar oí  du  To  lal  boi
       my  Dem 2  Cl red book
‘those two red books of mine’

(3)  \[
\text{DP Poss [DeicP Dem [QP Q [CIP Cl [NP (AdjP) N ]]]]]}
\]

Certain, restricted alteration of the neutral base order of constituents in (1) may occur for reasons relating to interpretation, revealing additional structural properties of Bangla nominal phrases. First, the NP constituent to the right of a classifier regularly undergoes repositioning to the left of the classifier and any numeral present when the nominal phrase has a definite interpretation (Chacón 2012, Dayal 2012), as shown in (4b). If this movement does not occur, as in (4a), a sequence of [Numeral Classifier (Adjective) Noun] will necessarily be interpreted as indefinite. For concreteness, we label the position which attracts the NP when a definite interpretation occurs as DefP, and assume that the licensing of definiteness features in the head of DefP causes the movement of the NP to take place, as in Chacón (2012).

(4) a.  \[
\text{[QP du [CIP To [NP lal boi]]]}
\]
\[2 \quad \text{Cl} \quad \text{red book}
\]
‘two red books’

b.  \[
\text{[DefP [NP lal boi]k [QP du [CIP To t_k]]]}
\]
\[2 \quad \text{Cl} \quad \text{red book}
\]
‘the two red books’

When a demonstrative occurs to add specifically deictic information, the leftwards movement of the NP occurs to a position between the demonstrative and the numeral, as in (5):

(5)  \[
\text{[DeicP oi [DeicP [NP lal boi]k [QP du [CIP To t_k]]]]}
\]
\[\text{Dem} \quad \text{red book} \quad 2 \quad \text{Cl}
\]
‘those two red books’

Second, adjectival phrases may undergo further leftwards movement to a position to the left of the demonstrative to encode heavy focal emphasis of the adjective, as in (6). Following Syed (to appear), we take this movement to occur to the specifier of a Focus Phrase/FocP projected below the position of possessors, as shown in (6).

(6)  \[
\text{[DP amar [FocP [AdjP khubi dami]m [DeicP oi [DeicP [NP t_m boi ]k [QP du [CIP To t_k]]]]]]}
\]
my very red that book 2 Cl
‘those two very red books of mine’

What we will focus on in this squib is the observation that nominal-internal movement for definiteness and/or focus is critically sensitive to and constrained by the presence of numerals in QP, between the base position and landing-site of NP/AdjP elements moved to higher positions. This kind of movement is acceptable when the low numerals 1-4 occur, but impossible when higher numerals are present. ² This is illustrated first with the leftwards movement of an NP over a numeral to encode a definite reading of the nominal phrase. As (7a/b) shows, this is possible over low numerals, but may not take place when higher numerals are present:³

(7) a. [[lal boi]₁ dj To/tin Te/char Te/ t₁k] b.*[[lal boi]₁ choy Ta/sat Ta/at Ta/nau Ta t₁k]
  red book 2-Cl/3 Cl/4 Cl     red book 6 Cl/7 Cl/8 Cl/9 Cl..
  ‘the 2/3/4 books’

Secondly, focus-movement of an AdjP is possible only when low numerals occur, and unacceptable with higher numerals, as seen in (8):

(8) a. [khubi joghonyo₃ koi dj To/tin Te/char Te/*choy Ta/*sat Ta/*at Ta t₃k biskut]
  very disgusting Dem 2 Cl/ 3 Cl/4 Cl
  ‘those very disgusting two/three/four biscuits’
  b. *[khubi joghonyo₃ koi choy Ta/sat Ta/at Ta t₃k biskut]
  very disgusting Dem 6 Cl/7 Cl/8 Cl biskut

In addition to movement of AdjPs and NPs, it is also possible for the complements of Ns to undergo nominal-internal focus-raising from their base position to the right of Cl, and this movement is again only acceptable when low and not high numerals are present:

(9) a. djOn dorSonSaStr-er odhayapok b. [dorSonSaStr-er], dj/at jOn t₁ odhayapok
  2 Cl philosophy-Gen professor     philosophy-Gen 2/8 Cl professor
  ‘two professors of philosophy’
Any attempt to raise a phrasal constituent past high numerals is consequently blocked within Bangla nominals, though fully licit when lower numerals occur. What might be the cause of the numeral-related differences in grammaticality found in (7-9)? As there are no obvious semantic reasons why higher numerals should block phrasal movement relating to definiteness and focus, the unacceptability of examples such as (7b/8b/9b) requires some kind of syntactic, structural explanation in which the roles of high and low numerals are distinguished. Building on certain new studies of the syntax of numerals, such an account is now developed, followed by an examination of its consequences.

In recent years, investigations of a range of syntactic patterns with numerals have advanced the theory that there is both cross-linguistic and language-internal variation in the projection of numerals, and that such elements may in certain instances occur as $X^0$ heads and elsewhere as phrasal specifiers. This has been argued for effectively on the basis of a variety of empirical phenomena found in different languages, in Danon (2012), Borer (2005), Bailyn (2004), Shlonsky (2004), Franks (1994) and Pereltsvaig (2006), and connects up with a wider body of work arguing that other lexical elements such as markers of negation, demonstratives, adverbs, and pronouns may occur either in specifier or head positions both across languages and within a single language, as revealed by different sets of syntactic evidence (Ouhalla 1990, van Gelderen 2004, Wood 2003, Soh 2001, Simpson and Syed 2014). We believe that such analyses offer the critical key to understanding the numeral-related patterns in Bangla, and suggest that the contrasts in (7-9) are primarily due to a simple but important difference in the structural position of low and high numerals in Bangla noun phrases. We posit that low numerals occur as heads in QP, while high numerals are projected in the specifier of QP. Such a difference in the structural location of low and high numerals provides a direct way of accounting for the blocking effect caused by high numerals. It can be assumed that phrasal elements base-generated in the NP domain which undergo raising to
positions related to definiteness and focus must move in a successive-cyclic way through SpecQP in order to reach these higher positions, and when SpecQP is occupied by a higher numeral, it creates an intervention effect and serves to block the movement.

SpecQP therefore functions as a nominal-internal escape hatch, facilitating movement to higher positions within noun phrases, in a way that is similar to other well-known patterns of escape hatch phenomena, for example, the need for extraction out of noun phrases to pass through the highest specifier position in the noun phrase (Szabolcsi 1994) and the need for long-distance wh-movement to pass through SpecCP as a clausal escape hatch (McCloskey 2000, among many others). Low numerals base-generated in the head position of QP (Q0) will freely allow for NP and AdjP constituents to make use of this SpecQP escape hatch and raise out of QP to higher nominal-internal positions, accounting for the well-formedness of examples such as (6), (7a), (8a), and (9a), where a low numeral occurs. Structure (10) below represents the full derivation of (6), in which the NP moves via the SpecQP escape hatch to SpecDefP, and this is followed by further movement of the AdjP beyond the demonstrative oi to the focus-related position below the possessor amar ‘my’:

(10)
The posited difference in structural location of lower and higher numerals in Bangla which allows for a simple account of the alternations in (8-10) shows a correlation with a further morphological phenomenon which distinguishes the low numerals 2-4 from all higher numerals. Classifiers combined with the former show special enclitic forms (To with ‘two’, Te with ‘three’ and ‘four’) and not the regular Ta classifier form which occurs with all higher numerals. It can be suggested that the occurrence of such irregular enclitic classifiers with the lower numerals has resulted from the structurally closer head-to-head relation which low numerals stand in to classifiers, with classifiers base-generated in the head C1 (Chacón 2012) attaching to and fusing with the preceding numeral head, perhaps via head-movement of the classifier to Q0, this conditioning the sound change in the coda of the classifier. By way of contrast, classifiers with larger numerals (hypothesized to be in SpecQP) pattern more like phrasal clitics, attaching to a preceding phrasal constituent, and consequently showing no parallel affix-like sound mutations.

Additional, related support for such a view is also provided by patterns found with non-numerical instantiations of QP. While quantifiers other than numerals such as Sob ‘every’ and prottek ‘each’ regularly block any leftwards focus-movement of NP/AdjP, and so can be analyzed as occurring in the specifier of QP, the quantifier kOyek ‘some/a few’ does permit movement to occur. However, raising of NP/AdjP over kOyek may only take place if kOyek occurs in a reduced enclitic form kO-, as illustrated in (11b). This is naturally accounted for if the full-form kOyek is projected in SpecQP (11a), like other non-numerical quantifiers and higher numerals, but its reduced enclitic form is projected in the head position of QP (11a), thus allowing for movement to occur through SpecQP:

(11) a. *[[NP lal boi], [QP kOyek [CIP Ta t1]]] b. [[NP lal boi], [QP t1 kO [CIP Ta t1]]]
   red book some Cl red book some Cl
   ‘I bought a few red books.’
3 Successive cyclic movement, the PIC and phases.

The intervention effects caused by higher numerals in Bangla can be argued to provide important novel evidence bearing on how the internal structuring of nominal projections generally constrains movement. Although related blocking effects have previously been attested with the extraction of phrases out of noun phrases, as for example in Spanish, where the presence of a structurally higher phrase inhibits the extraction of a lower phrase (Torrego 1987, Ticio 2005), the Bangla patterns examined here may be the first clear observation of intervention effects on movement occurring more locally in noun phrases, with phrasal movement that takes place fully within a nominal projection. This movement has the following two principal characteristics. First, it is caused by properties of focus and definiteness. Second, the movement needs to pass through SpecQP on its way to higher definiteness/focus-related positions. Critically, there is no quantificational feature in Q that causes movement of an NP/AdjP to its spec, as there is no raising of NPs/AdjPs to SpecQP in the absence of interpretations of focus or definiteness, and movement to and through SpecQP only takes place when an element needs to reach a higher position. Additionally, it can be noted that numerals in SpecQP have no definiteness features to license and so are not competing with NPs and AdjPs as more local targets for movement to the higher definiteness-related position. NPs and AdjPs which move through SpecQP and higher numerals base-generated in SpecQP thus appear to be in competition for a purely structural, unique position (SpecQP) and are featurally unrelated to each other. This argues against any analysis of the blocking/intervention effects which might attempt to attribute it to a Relativized Minimality-type effect in which the intervener (the numeral) shares features with a lower element and so blocks movement of the latter to a higher functional head searching for a particular type of feature. What the successive cyclic movement of NPs and AdjPs through SpecQP then indicates is that SpecQP functions as a structural escape hatch for elements in the lower part
of nominal projections which need to enter into agreement relations with a higher probe – an element must first reach and pass through SpecQP in order to be able to proceed higher up within the nominal structure.

From a Minimalist perspective, the only cause for this kind of movement, which occurs solely so that an element becomes visible to a higher probe, is to avoid a violation of the Phase Impenetrability Condition/PIC (Chomsky 2000:108):

(12) **Phase Impenetrability Condition.** In phase $\alpha$ with head $H$, the domain of $H$ is not accessible to operations outside $H$, only $H$ and its edge are accessible to such operations.

The PIC significantly distinguishes phases from other non-phasal constituents, automatically rendering the complement of the phasal head opaque for external Agree relations, and triggering movement of elements with unlicensed features to the edge of the phase (Legate 2003, Bošković 2005, Aboh et al. 2010). The important conclusion this naturally leads to in the case of Bangla definiteness and focus-related AdjP/NP movement is therefore that QP is in fact a *nominal-internal phase*, forcing successive cyclic movement to occur through its specifier/edge when elements from within QP need to Agree with functional heads in a higher part of the noun phrase, and that phases may therefore be projected in embedded positions within nominal projections and not simply occur as the highest (DP) projection of a nominal constituent, as has often been assumed.

Such a conclusion, that QP projects as a phase in Bangla, can furthermore also be advanced under a slightly different view of the intervention effect described here, which has assumed that QPs in Bangla project a *unique* specifier position, and if this position is occupied, no other phrase will be able to transit through SpecQP. As an alternative to the single-specifier view of QP, it would also be possible to adopt the analysis of phase edges presented in Bošković (to appear), where it is argued on the basis of extraction phenomena
found in Serbo-Croatian that all phases allow for multiple specifiers, but there is an important asymmetry in the status of the outer and inner specifiers of a phase, and it is only the outer specifier that is visible to elements in a higher phase (see Bošković (to appear) for full justification of such a view). If one combines such an approach with Richards (2001) view of ‘tucking-in’ movement, when an AdjP/NP in Bangla is moved to a SpecQP position already occupied by a higher numeral, this movement will result in the AdjP/NP tucking in as a lower specifier, and in such an inner phasal specifier position it will not be visible to probes in a higher phase, resulting in the blocking effect and the impossibility of movement, even though multiple specifier positions might theoretically be available with QP. Either a single specifier or a multiple specifier analysis of QP constituents in Bangla can therefore be argued to lead to the same conclusion, that the blocking effects of higher numerals on movement can most naturally be accounted for as a PIC effect, with QP projecting as a phase within nominal expressions.

4. Consequences: the phasal architecture of nominal projections

While the occurrence of phases was originally posited to be a phenomenon characteristic only of the clausal domain (CP, vP; Chomsky 1998), it has now become a common assumption that nominal projections also constitute phases, (Svenonius 2004, Hinzen 2012, Citko 2014, Bruening 2014, Bošković 2014 among many others). In a recent prominent approach to phases developed in Bošković (2014) it is suggested that the highest functional projection present in a nominal expression will be ‘contextually determined’ as the unique phase in any nominal structure, and in a language such as Serbo-Croatian, this will result in either NP or QP being determined to be a phase. Considering the patterns found in Bangla, there are signs that QP is actually not the highest functional projection in the nominal domain, and QPs occur as phases in the presence of other structurally higher elements whose regular neutral sequencing suggests the presence of an array of functional projections above
QP, as depicted in structure (10). Additionally, the triggers for the focus and definiteness-related movement which cause NPs and AdjPs to raise beyond QP can be attributed to features present in functional heads above QP, and an Agree relation between such heads and AdjP/NP goals located in lower positions. If Bangla nominals therefore do indeed project from QP up to a higher DP-level of structure, and such constituents pattern as phases as in other languages, the conclusion to result from this would be that nominal projections may in fact consist in two phasal cycles, an internal, mid-level phase (QP), and a higher-level phase (DP), and hence resemble clauses in being bi- rather than mono-phasal constituents, as might be expected given other structural parallels that exist between clauses and nominal expressions (Abney 1987, Szabolscı 1994). Further empirical evidence for the occurrence of DP level phases in Bangla will need be explored in future work, and is beyond the scope of the present article, but the possibility now certainly presents itself that clauses and nominal constituents may show a greater similarity in their internal phasal structuring than previously assumed.

NOTES

1 The following symbols are used to represent sounds in Bangla: T, D, R represent retroflex /t/, /d/, /r/; S is palato-alveolar /s/, N a velar nasal, M nasalization, and O is a low-mid back rounded vowel.

2 When the numeral 5 occurs, movement across the numeral is accepted by some speakers but not others. All speakers seem to reject movement across numerals 6 and higher.

3 We do not include the numeral one in the examples here as the use of one often seems to be subject to additional idiosyncratic restrictions which are not clearly syntactic in nature.

4 The patterns also argue against a Relativized Minimality account which would posit that Q-features present in Q-type elements might block movement between higher definiteness and
focus-related projections and lower AdjPs/NPs. If the presence of such features in Q-elements could block the movement of lower AdjPs/NPs, one would naturally expect that all Q-elements would have these features, and the blocking effect would not just be found with higher numerals. The observation that it is just a subset of Q-elements – higher numerals and the full form of koyek ‘some’ - that block movement makes a structural account much more plausible, in which only the Q-elements projected in Spec positions will cause movement through such a position to be ill-formed. A reviewer of the paper also notes that the essence of a Spec-head structural account could not easily be incorporated into a Relativized Minimality feature-based approach, as both SpecQP and Q asymmetrically c-command AdjP/NP and so should intervene in parallel ways if Q-elements in SpecQP and Q both had a relevant blocking Q-feature. Consequently, an account seems to be called for which does not crucially reference features on Q-elements as the cause of the intervention effects (wherever these features might be present), and instead attributes the ungrammaticality of examples such as (7b), (8b), (9b) and (11b) to the need for movement of AdjPs/NPs through SpecQP. Many thanks to the reviewer of the paper for comments on this point.

REFERENCES


Dayal, Veneeta. 2012. “What can South Asian Languages tell us about classifier systems?” Paper presented at the conference on Formal Approaches to South Asian Languages/FASAL-2, MIT.


