Variation in Bangla complementizer order at the syntax-prosody interface[*]

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1. The Bangla *je* puzzle

One of the foremost research questions at the syntax-phonology interface concerns the degree to which word order is determined by phonological or prosodic requirements (Zec and Inkelas 1990, Zubizarreta 1998, Bošković 2001, López 2009, Richards 2010, Elfner 2012, among many others). This paper defends a view of the syntax-phonology interface in which word order is determined by competition between both syntactic and prosodic well-formedness conditions. Specifically, I propose that the pronunciation of movement copies is determined by the interaction of violable syntactic and prosodic constraints. This approach is illustrated in an analysis of variation in the placement of the finite complementizer *je* in Bangla, a longstanding problem in Bangla syntax.

In Bangla, possible orderings of the finite complementizer *je* in an embedded clause depend on the position of the clause relative to the main verb. Based on the description by Bhattacharya (2001), the pattern is as follows. While the default word order in both main and embedded clauses is SOV (Dasgupta 1980), discourse-neutral embedded clauses headed by *je* are postverbal. In postverbal embedded clauses, *je* can only be pronounced in a clause-initial position.

(1) a. Jon jane [**je** ma   oSudh   khey-eche]
     b. *Jon jane [ma   **je** oSudh   khey-eche]
     c. *Jon jane [ma   oSudh **je** khey-eche]
        John knows that mother that medicine that eat-PERF
        'John knows that mother took medicine.'

When the embedded clause is *preverbal*, either sentence-initial or following the matrix subject, *je* must surface after at least one phrase within the embedded clause.

(2) a. *Jon [**je** ma oSudh khey-eche] jane
    b. Jon [ma **je** oSudh khey-eche] jane
    c. Jon [ma oSudh **je** khey-eche] jane
    John that mother that medicine that eat-PERF knows
    'John knows that mother took medicine.'

The positions of embedded clauses appear to be restricted by their discourse interpretations. In discourse-neutral contexts or broad focus, embedded clauses with *je* are obligatorily postverbal. On the other hand, embedded CPs precede matrix verbs under more restricted discourse conditions. Sentence-medial CPs, which follow the main clause subject but precede the main verb, obligatorily bear emphatic or corrective focus. Sentence-initial CPs, which precede main clause subjects, are generally topicalized, though this final distinction is not as robust among speakers.

This paper presents new data on embedded topicalization and focus to argue that both initial and non-initial *je* orders are derived in the extended CP domain (Rizzi 1997, Benincà and Poletto 2004, among many others). Specifically, I argue that non-initial *je* orders are derived by lower copy spell-out (Franks 1998, Bošković 2001, Bobaljik 2002, among others), where *je* is pronounced in a low complementizer position. I further propose that lower copy spell-out is triggered by a prosodic condition. Preverbal, but not postverbal embedded clauses are parsed as intonational phrases; lower copy spell-out thus takes place to avoid the pronunciation of *je* at an intonational phrase edge. As compared with previous accounts of the pattern (Bhattacharya 2001, Chacón 2014, Bayer and Dasgupta, to appear), the analysis provides a more precise description of the syntactic placement of initial and non-initial *je*, and identifies a more explanatory motivation for the asymmetry. de

2. **Bangla *je* and the clausal left periphery**

This section aims to identify the syntactic positions of both initial and non-initial *je* by considering their possible orderings relative to fronted topics and foci within embedded clauses. I show that the patterning of the complementizer receives a straightforward explanation in the model of the clausal periphery of Rizzi (1997), which splits the traditional Complementizer Phrase into a series of functional projections. The core structure that I assume, based on Benincà and Poletto (2004), is given in (3).

(3) [ForceP Force [TopicP Topic [FocusP Focus [FinP Finiteness [InflP ...

The difference between the initial and non-initial *je* patterns amounts to variation in where the complementizer is pronounced. In postverbal clauses, *je* is pronounced in the highest head, Force; in preverbal clauses it is pronounced in the lower Fin(iteness) head.

2.1   Topicalization and focus in postverbal embedded clauses

We first turn our attention to postverbal embedded clauses, where *je* is obligatorily initial. While the neutral word order for transitive sentences in Bangla is SOV, OSV word orders are also available. Numerous studies have established that relatively free word order of this type is constrained by information structure restrictions; Placement of objects in pre-subject positions is commonly restricted to definite or specific DPs, while indefinite objects can only front if they are contrastively focused (Moltmann 1990, Diesing 1992). I show that this generalization is also true of Bangla, suggesting that OSV order is generated by the movement of objects to TopicP or FocusP.

Consider the patterning of definite objects in postverbal clauses.[1] As expected, non-focused definite objects (here, *chatro du-to-ke* 'the two students-ACC') can appear either in the preverbal object position (4) or in a pre-subject position (5).

(4)   Jon   bol-lo   [je   dadubhai   *chatro du-to-ke*   dekh-eche]
       John   say-PST   that   grandfather   student 2-CL-ACC   see-PERF
       'John said that grandfather saw the two students'

(5)   Jon   bol-lo   [je   *chatro du-to-ke*   dadubhai   dekh-eche]
       John   say-PST   that   student 2-CL-ACC   grandfather   see-PERF
       'John said that grandfather saw the two students'

Compare this to the patterning of indefinite or quantified objects, which are generally non-specific and thus ineligible topics. Fronting to the left of the subject crucially results in a loss of grammaticality under an intended non-focused reading (6), (7). This suggests that object fronting typically targets a high TopicP above the regular subject position (cf. Simpson and Bhattacharya 2003 for similar arguments in main clauses).

(6)   # Jon   bol-lo   [je   *du-to   chatro-ke*   dadubhai   dekh-eche]
       John   say-PST   that   2-CL   student-ACC   grandfather   see-PERF

(7)   # Jon   bol-lo   [je   *kau-ke*   dadubhai   dekh-e-ni]
       John   say-PST   that   anyone-ACC   grandfather   see-PERF-NEG

However, indefinite and quantified objects are acceptable in pre-subject positions if they bear focal prominence and are interpreted as contrastively focused.

(8)   Jon   bol-lo   [je   *KAU-KE*   dadubhai   dekh-e-ni]
       John   say-PST   that   anyone-ACC   grandfather   see-PERF-NEG
       'John said that grandfather didn't see ANYONE.'

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[1] While Bangla lacks overt determiners, definiteness is indicated by the relative orderings of nouns with numerals and classifiers (Bhattacharya 1999). Nominal phrases with [Num-Cl NP] order are indefinite, whereas [NP Num-Cl] order is interpreted as definite.

The acceptability of such examples suggests either that contrastively focused objects are permitted to front to TopicP, or that they target a distinct position above the subject position. The next section presents data to support the latter hypothesis.

2.2   Topicalization and focus in preverbal embedded clauses

Previous works have noted that phrases that precede non-initial *je* typically require a special discourse interpretation, leading to analyses of *je* in preverbal clauses as a focus marker (Dasgupta 1980) or as a complementizer that marks contrast (Bhattacharya 2001) or emphatic topicalization (Bayer and Dasgupta, to appear). I argue that these descriptions are on the right track, but in need of some refinement. Phrases that precede *je* can be either topicalized or contrastively focused, with some ordering restrictions. However, these interpretational constraints apply to fronted objects, but not to subjects.

We now apply the diagnostics from the previous section to preverbal embedded clauses, to show that non-initial *je* occurs below an embedded TopicP and FocusP. Non-focused definite objects, which are possible topics, can freely precede *je* (9). However, they can also remain in a post-subject position provided that *je* is not initial within the embedded clause.

(9)   Jon   [*chatro du-to-ke* je   dadubhai   dekh-eche]   bol-lo
       John   student 2-CL-ACC that grandfather see-PERF   say-PST
       'John said that grandfather saw the two students'

Turning to indefinite and quantified DP objects, we note that they are dispreferred to the left of *je* under a neutral reading (10), (11). However, these word orders are possible if the indefinite is contrastively focused (12). We thus have evidence that objects that precede *je* in preverbal clauses must occupy either a topic or focus position.

(10)   # Jon [*du-to chatro-ke*   je   dadubhai   dekh-eche]   bol-lo
       John   2-CL   student-ACC that grandfather see-PERF   say-PST

(11)   # Jon [*kau-ke*   je   dadubhai   dekh-e-ni]   bol-lo
       John   anyone-ACC that grandfather see-PERF-NEG say-PST

(12)   Jon   [*DU-TO   CHATRO-KE* je   dadubhai   dekh-eche]   bol-lo
       John   2-CL   student-ACC that grandfather see-PERF   say-PST
       'John said that grandfather saw TWO STUDENTS.'

Lastly, we turn to the observations by Bhattacharya (2001) and Simpson and Bhattacharya (2003) that the topic and focus positions can be simultaneously filled as long as topics precede focused phrases (13), and non-topics do not precede focus (14). Whereas multiple topics are permitted, only one focused phrase can precede *je*.

(13) Jon [*chatro du-to-ke kal*   *DADUBHAI* je dekh-eche] bol-lo
      John student 2-CL-ACC yesterday grandfather that see-PERF   say-PST
      'John said that GRANDFATHER saw the two students yesterday'

(14) # Jon [*du-to chatro-ke*   *DADUBHAI* je   dekh-eche] bol-lo
      John 2-CL student-ACC grandfather that   see-PERF   say-PST

     Based on these patterns, and semantic factors to be discussed in Section 3, I propose
that non-initial *je* instantiates the Fin complementizer head below TopicP and FocusP.

(15) [ForceP [TopicP(s) (XP_top) [FocusP (XP_foc) [FinP (*je*) [InflP ...]]]]] ... V

At this point, a structural account of variation in *je*'s placement emerges. Initial *je* in
postverbal clauses occurs in Force, while non-initial *je* in preverbal clauses is in Fin. In
the next section, I argue that this variation receives a principled explanation as the result
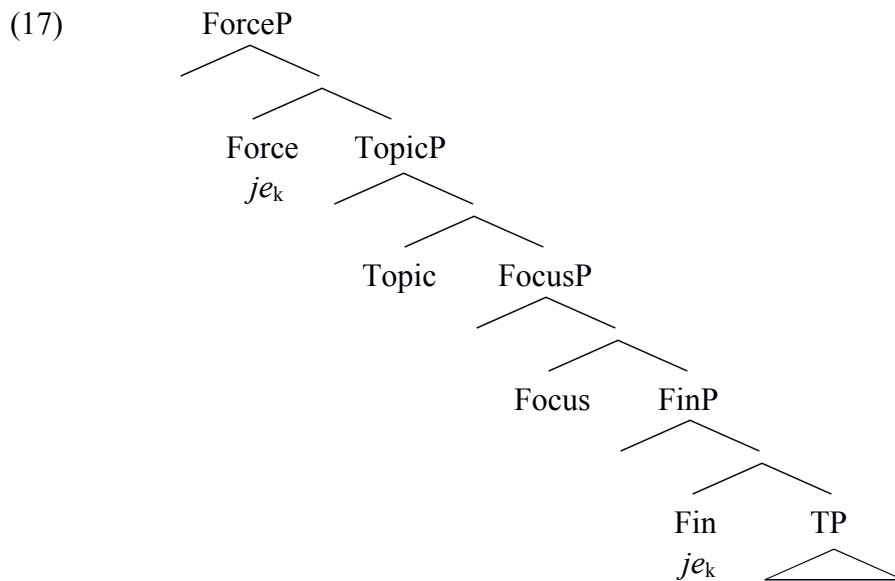of a difference in copy spell-out.
     I end this section with a note on a unique property of subjects. While object DPs may
only precede *je* under topicalization or contrastive focus, the same restriction does not
hold for subjects in this position. In addition to definite subjects, indefinites and
quantified phrases are freely admitted preceding *je,* even in the absence of focus.

(16) Jon [kew   je   ase-ni]   bol-lo
      John [anyone that come-NEG]say-PST
      'John said that no one came'

The patterning of subjects casts doubt on analyses that propose that the fronting of
phrases before *je* takes place uniquely in order to license topicalization or focus
(Bhattacharya 2001, Bayer and Dasgupta, to appear). Rather, it appears that non-initial *je*
simply occurs in low position that generally follows topics and foci. The subject-object
asymmetry mirrors a common pattern in second-position effects, where subjects in first
position do not show interpretational restrictions that apply to non-subjects (Holmberg, in
press), suggesting that the pattern is likely due to a universal property of the left
periphery. In the absence of further diagnostics for the positioning of subjects, however, I
will assume for the present purposes that they occupy Spec, FinP.

3.   Copy spell-out in the Bangla left periphery

I argue that the variable positions of *je* provide evidence for a lower copy spell-out
analysis (Franks 1998, Bošković 2001, Bobaljik 2002, among others). Assuming that
Move creates a copy of a previously merged item (Chomsky 1993), I propose that all
embedded *je*-CPs have the base structure (17), where *je* is first merged in Fin, and copied
in Force. This accounts for the fact that regardless of their position, clauses with *je* must
be both declarative, a Force specification, and finite, a Fin specification (Rizzi 1997).

(17)

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                    ForceP
                   /\
                  /  \
              Force   TopicP
              jeₖ    /\
                    /  \
                Topic   FocusP
                       /\
                      /  \
                  Focus   FinP
                         /\
                        /  \
                     Fin    TP
                     jeₖ   /_\
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Given this structure, pronunciation of *je*'s highest copy in Force yields the *je*-initial order of postverbal CPs. Two operations are necessary to produce non-initial orderings of *je*: pronunciation of the lower copy in Fin, and movement of at least one XP to a higher position. A critical advantage of proposing a single movement chain in both preverbal and postverbal clauses is that it explains why *je*'s formal properties (+finite, +declarative) are independent of its surface position.

It is crucial that *je*'s movement from Fin to Force take place in one step (cf. Roberts 2000 on "long-distance" head movement), as it explains why non-initial *je* can be preceded by multiple topics or topics and focus (13). If *je* were to leave copies in the structurally intervening Topic and Focus heads, one might expect *je* in preverbal clauses to be obligatorily pronounced in its next highest copy, after exactly one phrase. Such examples also exclude an alternative account in terms of Local Dislocation (Embick and Noyer 2001), a postsyntactic operation that creates a complex head from adjacent terminals, potentially altering their base ordering. Again, the nature of the operation does not account for "non-local" reorderings where more than one phrase precedes *je*.

Following numerous works, I propose that the pronunciation of copy chains is determined by requirements of the interfaces (Franks 1998, Bošković 2001, Corver and Nunes 2007 and works therein). Specifically, while only the highest copy of a movement chain is pronounced by default, the pronunciation of a lower copy or of multiple copies can occur to prevent the violation of a variety prosodic conditions. In the next section, I argue that lower copy spell-out in Bangla takes place to prevent the placement of prosodically weak *je* at an intonational phrase edge.
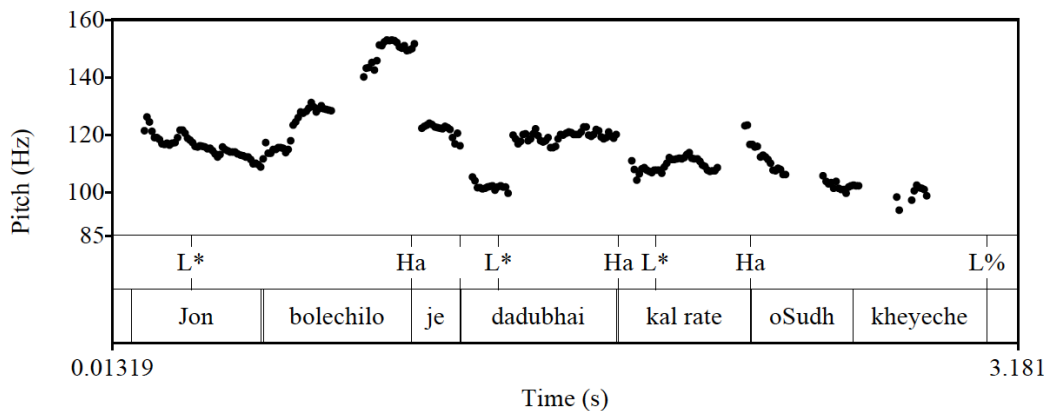
4. The prosodic factor in copy spell-out

Following a brief overview of Bangla prosody, this section argues that preverbal embedded clauses are demarcated by stronger prosodic boundaries than postverbal ones; only preverbal clauses form intonational phrases. The avoidance of pronouncing the

highest copy in preverbal clauses thus amounts to a ban against prosodically weak *je* at intonational phrase edges, a cross-linguistically common marked structure (Franks 1998).

Following previous work on Bangla prosody (Hayes and Lahiri 1991, Khan 2008, and references therein), I assume a model with two prosodic constituent types above the word, the *phonological phrase* (P-phrase) and *intonational phrase* (I-phrase). P-phrases correspond closely to non-clausal syntactic XPs (Hayes and Lahiri 1991), and are typically associated with a low pitch accent on their first stressed syllable (L*) and a high boundary accent at the right edge (Ha). I-phrases consist of groupings of P-phrases that generally correspond to main clauses or utterances. These are distinguished by a larger variety of right boundary tones, with a closer correspondence between individual tones and discourse interpretations. While Khan (2008) identifies five I-phrase tones, we will be primarily concerned with the rising tone (LH%) and fall and rise tone (HLH%), which function like continuation rises. Crucially, when multiple right boundaries are aligned with each other, only the tone of the highest-level category is realized.

A typical realization of a discourse-neutral postverbal embedded clause is shown in the pitch track below. Several P-phrases are identified by their L*...Ha pitch contour, while the pitch fall following *kal rate* into the end of the utterance realizes the declarative L% boundary tone. Crucially, the main verb standardly bears a high P-phrase boundary tone (Ha)[2], suggesting that no I-phrase boundary precedes the embedded clause.

(18) Jon   bol-echi-lo   [je   dadubhai   kal rate   oSudh   khey-eche]
      John   say-PERF-PST   that   grandfather   last.night   medicine   eat-PERF
      'John had said that grandfather took medicine last night.'

It is important to note as well that a clear pitch fall is regularly observed between the main verb and *je*. This argues against analyses of *je* as a sort of enclitic to the main verb (Chacón 2014, Bayer and Dasgupta, to appear), as one would expect the high boundary tone of the verb-associated P-phrase to extend through any enclitics.
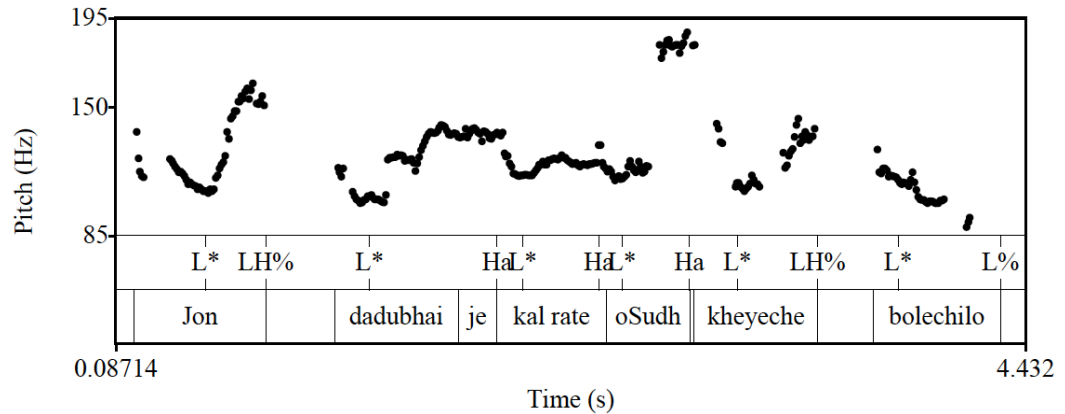
Consider now the prosodic phrasing of a sentence-medial embedded clause, as shown in (19). Unlike postverbal ones, medial embedded clauses are identified as separate

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[2] The P-phrase that precedes the postverbal clause boundary is in some instances realized with a high pitch accent and low boundary tone (H*...La), a less-common but attested P-phrase realization (Khan 2008).

intonational phrases by several diagnostics. The critical distinction is that preverbal clause boundaries are typically preceded by the rising boundary tone (LH%) and fall and rise tone (HLH%) indicative of intonational phrase boundaries. In addition, preverbal clause boundaries are more commonly separated by a short pause, as also shown below.

(19)   Jon   [dadubhai   je   kal rate   oSudh   khey-eche]   bol-echi-lo
       John   grandfather   that   last.night   medicine   eat-PERF]   say-PERF-PST
       'John said that grandfather took medicine last night.'

In summary, preverbal embedded clauses form intonational phrases, while postverbal clauses do not. The distinction formalizes the intuitions of Simpson and Bhattacharya (2003) and Bayer and Dasgupta, to appear, that preverbal embedded clauses are separated by larger prosodic breaks. It is further consistent with the generalization that focused or topicalized items are flanked by larger phrase boundaries than their neutral counterparts.

    I propose that the ban against *je* in the initial position of an intonational phrase is due to the complementizer's prosodic deficiency - specifically, the fact that it does not form a prosodic word (PWd). As shown by Fitzpatrick-Cole (1991), all unaffixed, monosyllabic lexical words in Bangla are realized with long vowels, indicating that the Bangla PWd is minimally bimoraic. Crucially, the complementizer *je* does not undergo lengthening, indicating that it is prosodically realized as a syllable that does not additionally project to a PWd, a common representation for function words (Selkirk 1996).

    The ban against *je* at an intonational phrase boundary can be attributed to a member of the STRONGSTART constraint family (Selkirk 2011, Elfner 2012), which disprefers a variety of proclitic structures. Specifically, I propose that all possible prosodic phrasings of *je* at the left edge of an intonational phrase violate STRONGSTART(σ/IPhr).

(20)   STRONGSTART(σ/IPhr)
       Assign a violation for every intonational phrase whose leftmost daughter constituent is a syllable, and is lower in the Prosodic Hierarchy than its sister constituent immediately to the right.

    The mapping from syntactic structure to a linearized prosodic representation is implemented in an Optimality-Theoretic grammar (Prince and Smolensky 1993) where

syntactic and prosodic well-formedness conditions compete, allowing syntactic preferences on linearization to be overridden for the satisfaction of prosodic markedness restrictions (cf. López 2009, Elfner 2012). Specifically, I propose that GEN, the component that defines possible outputs, accesses movement chains and creates output candidates with different copies pronounced. The 'unmarked' preference to pronounce only the highest copy of a movement chain is implemented by a violable constraint HIGHESTCOPY. In Bangla, HIGHESTCOPY is outranked by STRONGSTART(σ/IPhr), resulting in lower copy spell-out of *je* in preverbal embedded clauses. Future work will propose an expanded implementation of this proposal in the context of a more general theory of syntax-prosody mapping and intonational phrasing in Bangla.

5.   Conclusion

This paper has proposed an analysis of the distribution of the Bangla complementizer *je*, arguing that non-initial orderings are derived by lower copy spell-out, which applies to prevent the pronunciation of the complementizer at an intonational phrase edge. I have argued that this account, which crucially depends no the interaction of syntactic and prosodic well-formedness conditions, provides superior explanatory power versus prior approaches to the problem. The data and analysis also contribute to a growing body of evidence that some conditions on word order depend crucially on prosodic phrasing.

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