Embedded Alternatives and Alternative Questions

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Abstract

This paper investigates interrogative disjunction in Bangla: a language that does not display focus intervention effects in alternative questions, does not allow disjunctive subjects with interrogative disjunction, and cannot neutralize the boolean-interrogative divide within the disjunction space, unlike other attested languages such as Mandarin Chinese. We argue that all of these properties can be given a unified explanation if the following claim can be motivated - the clause-embedding element *whether* and the interrogative disjunction marker in Bangla are underlyingly the same element. We defend this claim at the syntax-semantics interface, making connections with the cross-linguistic paradigms of alternative questions and disjunction. A robust link between Q operators and disjunction is cross-linguistically attested, and we argue that Bangla is a language that embodies this connection. We investigate and reject an overt operator movement approach, and motivate a disjunction reduction approach with ellipsis in the syntax. In the semantics, aided by a semantic implementation within Alternative Semantics, we argue that the underlying element introduces and partially manipulates focus alternatives consistently across all the configurations.

Keywords: Disjunction, Alternative Questions, Focus Alternatives, Bangla

1 Introduction

Consider the following constructions in English:

(1) a. I wonder whether John wants to go to Delhi.
b. I wonder whether or not John wants to go to Delhi.
c. I wonder whether John wants to go to Delhi, or Bombay.

(1a) is an embedded polar question (henceforth, PolQ) whereby what is being wondered is if John wants to go to Delhi or not. (1b) has an overt occurrence of the phrase *or not* but has an almost identical meaning as (1a), as first argued in Karttunen (1977), followed by Larson (1985b). (1c) is an embedded alternative question (henceforth, AltQ). AltQs have been

argued to have a different structure, in that the *whether* is regarded as the *scope* marker of the embedded disjunctive phrase [Delhi or Bombay]. Note that all three of these constructions in English have *whether* and an overt (in 1b and 1c) or covert (in 1a) disjunction with the connective *or*. This paradigm speaks of possibly deep connections between the three types of structures involving disjunction scope and alternatives.

Investigating similar paradigms in other languages helps us to explore the extents to which such connections are hardwired in Universal Grammar. In this paper, we will investigate the same paradigm in Bangla, and will demonstrate that the language is an instantiation of a deep relationship between interrogative disjunction and clausal alternatives-encoding expressions like *whether*.

Consider the Bangla counterpart of the paradigm in (1).

(2) a. *Ma jaan-te chai-che Ram Dilli je-te cha-y **kina**.*
ma know-IMPV want-PRES.3P Ram Delhi go-IMPV want-HAB KINA
'Ma wants to know/is wondering whether Ram wants to go to Delhi.'

b. *Ma jaan-te chai-che Ram Dilli jete chay **ki na**.*
ma know-IMPV want-PRES.3P Ram Delhi go-IMPV want-HAB KINA
'Ma wants to know/is wondering whether or not Ram wants to go to Delhi.'

c. *Ma jaan-te chai-che Ram **ki** Dilli **na** Bombay je-te cha-y.*
ma know-IMPV want-PRES.3P Ram KI Delhi NA Bombay go-IMPV want-HAB
'Ma wants to know/is wondering whether John wants to go to Delhi, or Bombay. '

The interesting thing to note in this pattern is the presence of the two morphemes *ki* and *na*. When concatenated together, they appear to form the word for *whether*: 'kina'; when written orthographically with a space between them (cf. Dasgupta 1980) and uttered with a very slight pause between them, they appear to stand for the phrase *whether or not*; and when they appear at a distance from each other, they mark disjunction in an embedded AltQ. It is striking that this language uses the exact same morphemes in all three constructions.

A starting empirical observation of this paper is the following fact: surprisingly, Bangla AltQs cannot be embedded under rogative or responsive predicates[1] with *whether*, unlike other languages.

(3) a. I wonder whether John likes tea, or coffee.

b. **Amy jaan-te chai-che John cha, na coffee pochondo kor-e kina.*
Amy know-IMPV want-PRES.3P John tea NA coffee like do-HAB KINA
Intended: 'Amy is wondering whether John likes coffee, or tea.'

AltQs are systematically ungrammatical when embedded with *whether*, but acceptable otherwise.

[1]Bangla has different markers for interrogative and boolean disjunction. We will currently focus on the former; we discuss the latter in the ensuing sections.

(4) *Amy jaan-te chai-che John cha, na coffee pochondo kor-e.*
Amy know-IMPV want-PRES.3P John tea NA coffee like do-HAB
'Amy is wondering whether John likes coffee, or tea.'

Another important empirical fact is that an embedded question with *ki* cannot occur with *kina* under a rogative predicate. As the paradigm below shows, *ki* and *kina* are in perfect complementary distribution, with the appearance of one blocking the appearance of the other.

(5) a. **Anu jaan-te cha-y tumi* ***ki*** *cha kha-be* ***kina***
Anu know-IMPV want-HAB you KI tea eat-FUT.2P KINA
Intended: 'Anu is wondering whether you will have tea.'

b. *Anu jaan-te cha-y tumi ki cha kha-be?*
Anu know-IMPV want-HAB you KI tea eat-FUT.2P
'Anu is wondering will you have tea?'

c. *Anu jaan-te cha-y tumi cha kha-be kina*
Anu know-IMPV want-HAB you tea eat-FUT.2P KINA
'Anu is wondering whether you will have tea.'

This complementary distribution pattern is usually not the case with Q-particles and *whether* in the world's languages. For example, the following Hindi example from Bhatt and Dayal (2017) show that the presence of what they call the null *whether* operator is perfectly compatible with the Q-particle *kyaa*.

(6) *Anu jaan-naa caah-tii hai [ki kya: tum cai piyoge]*
Anu.F know-INF want-HAB.F be.PRS.SG that $Q_{Y/N}$ you tea drink.FUT.2MPL
'Anu wants to know whether you will drink tea.'

(Bhatt and Dayal (2017): 14b)

These grammaticality contrasts strongly point to the validity of one of the main claims to be pursued in this paper: underlyingly, the representation of *whether* and interrogative disjunction is exactly the same element in the language. In particular, we will claim that it is *kina* that is present underlyingly in all of the constructions. The other surface forms: *ki na* and *ki…na* are derived via either ellipsis or movement.

Concretely put, the main hypothesis can be preliminarily formulated as follows:

(7) CONCATENATION CLAIM (to be revised):
What looks like the clausal alternative-encoding expression 'whether' (*kina*) is itself actually the concatenation of a disjunction connective (*na*) and its scope marker (*ki*).

The scope marker may overtly move to mark the scope of disjunction, resulting in a discontinuous instantiation resembling *ki…na*. There is no overt movement when there is no disjunction embedded under *kina*, or when the second disjunct is fully elided. In the ensuing sections, we will draw several strains of evidence in support of these claims. In addition, our goal will be to argue that a revised Concatenation Claim (henceforth, CC) can

provide a unified explanation for three seemingly disparate properties of the Bangla grammar: lack of focus intervention effects in alternative questions, disallowance of disjunctive subjects with interrogative disjunction, and the non-neutralization of the boolean-interrogative[2] divide within the disjunction space. We will derive each of these properties in turn. Before we begin, some remarks regarding the status of the morphemes *ki* and *na* are in order.

This paper is organized as follows: in the next section, we explore the link between Q and disjunction; in Section 2, we lay out our syntactic proposals unifying the constructions; in Section 3, we briefly introduce the framework of Alternative Semantics, following which in Section 4 we provide the our semantic analysis for the proposed unification. Section 5 explores focus intervention effects in both Bangla and cross-linguistic AltQs; Section 6 concludes.

1.1 Q-morphemes and disjunction

Both *ki* and *na* have independent statuses in the language. *Na* usually marks post-verbal negation, as shown in (8). *Ki* is homophonous between being the Q particle in PolQs, and a thematic *wh* word with the meaning 'what'.[3] Our focus will be on polar *ki*.

(8) *Ami baaje chele-ta-r sathe kotha bol-bo na.*
I bad boy-CL-GEN with talk talk-FUT.1P NEG
'I will not talk to the bad boy.'

(9) a. *Tumi aajke dilli cho-le ja-ccho ki?* Polar *ki*
you today Delhi go-IMPV go-PROG.2P KI
'Are you going to Delhi today?

b. *Tumi kaal ki khe-ye-chile?* Thematic *ki*
you yesterday what eat-IMPV-PAST.2P
'What did you eat yesterday?'

One important question is - why would a PolQ particle like *ki* be involved in signifying disjunction in a language? Looking at other languages points us towards an answer. The link between Q-particles and disjunction has been robustly attested cross-linguistically. In numerous languages, quoting Jayaseelan (2008), "with a regularity that is far greater than by chance", the Q-particle is also the disjunction marker. Bailey (2010) cites several studies that demonstrate this connection in the languages in question - Van Klinken (1999) for the Austronesian language Tetun, Jayaseelan (2008) for the Dravidian language Malayalam, Amritavalli (2003) for the Dravidian language Kannada, Aldridge (2011) for Chinese. A representative paradigm from Malayalam is given below:

[2]We will be using the term 'boolean' to solely refer to non-interrogative disjunction throughout this paper.
[3]Bhatt and Dayal (2014, 2017) make the same distinctions for Hindi *kyaa*; we follow their nomenclature here.

(10) a. *John-**oo*** *Bill-**oo*** *Peter-**oo*** *wannu*
John-DISJ Bill-DISJ Peter-DISJ came
'John or Bill or Peter came.'

b. *Mary wannu-**oo**?*
Mary came-Q
'Did Mary come?'

(Jayaseelan 2008: 3)

In addition to these languages, Jayaseelan also cites empirical evidence of the same connection between the disjunctive connective and the Q-particle in Sinhala (cf. Hagstrom 1998) and Japanese (cf. Kuroda 1965,Nishigauchi 1990). The Japanese examples are provided below:

(11) a. *John-**ka*** *Bill-(**ka**)-ga* *hon-o* *katta* (Kuroda 1965)
John-DISJ Bill-DISJ-NOM books-ACC bought
'John or Bill bought books.'

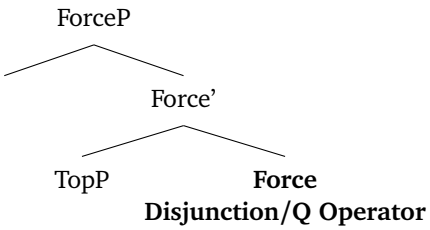
b. *Dare-ga* *kimasu-**ka**?* (Nishigauchi 1990: 18)
who-NOM come-Q
'Who's coming?'

Thus, there appears to be a well-attested link between Q-particles and disjunction. Jayaseelan (2001, 2008) presents convincing arguments for the claim that in languages like Malayalam, Sinhala and Japanese, the question particle is the lexical realization of the disjunction operator itself. Adopting Baker (1970)'s insight, he argues for the following three-way identification, within which he suggests the correlation in the box is universal:

(12) question particle = question operator = disjunction operator

As to exactly why this underlying equivalence exists, Jayaseelan (2008) proffers an intuitive solution: questions involve 'partitions' within the space of answers, and thus inherently invoke disjunction. It is the disjunction operator then that arguably implements the partition. Thus, under such a conceptualization, it is the disjunction operator that is overtly present in the Force projection of questions, and is responsible for the question semantics. The structure alluded to in Jayaseelan (2001) would conceivably look like the following, adopting Rizzi (1997)'s vision of the left periphery:

(13)



This ForceP is what is selected by question-embedding rogative predicates, in this analysis. There is no separate question operator; the disjunction operator is the question operator and the question operator is the disjunction operator.

In Bangla, the patterns we have seen so far seem to bear an uncanny resemblance to a section of the cross-linguistic facts described above. The question operator-disjunction operator equivalence can be straightforwardly maintained. Based on this discussion, we claim that the lexical category of *kina* is that of a *disjunctive complementizer*.[4] Bangla appears to epitomize the relationship forged by Jayaseelan in (12) in a robust manner, whereby the Q-particle forms part of the complex that functions as both interrogative disjunction as well as *whether*.

This disjunctive complementizer is always merged to the left in the predominantly head-final language. In this property, *kina* is not alone. Bangla is famous for another left-headed complementizer - *je*, whose complement clause appears to the right of it (as opposed to the right-headed complementizer *bole*). This pattern fits in with the growing body of work in Bangla that acknowledges its characteristic of mixed-headedness (Bayer 1999, Bhattacharya 2000, Dasgupta 2007, among others).

1.2 The boolean-interrogative divide

Consider the question:

(14) *John (ki) maach **na** mangsho khete bhalobaash-e?* ✓AltQ, *PolQ
Ram KI fish NA meat eat-IMPV love-HAB
'Does Ram like to eat meat or fish?'

As mentioned above, this question can only have an AltQ interpretation. This configuration is also the only way to get interrogative disjunction in Bangla: with *na* appearing as the disjoining connective on the surface, and an optional second-position *ki*. As articulated in the CC, the *ki* particle will be argued in this paper to be a marker of the scope of disjunction in the following sections.

As soon as we replace *na* with *ba*, the boolean disjunction marker, the question can have only a PolQ interpretation. Note that the boolean disjunction connective can disjoin sub-clausal constituents, unlike interrogative disjunction (we discuss this in more detail in Section 5).

(15) *John ki maach **ba** maangsho khe-te bhalobaash-e?* *AltQ, ✓PolQ
John KI fish or meat eat-IMPV love-HAB
'Does John like to eat fish or meat?

One important point to note here in (62) is the presence of a *ki*. This *ki*, we argue, is just the PolQ marker/Y-N Q-particle, and *not* the marker of disjunction scope here. We will go as far as to claim that the presence of *ki* has no relationship to the scope of disjunction with *ba*.

To make this claim concrete, let us consider one of Rooth and Partee (1982)'s examples demonstrating that *or* has the properties of a scope-bearing element.

(16) Mary is looking for a maid or a cook.

[4] We are borrowing this term from Bayer (2004) who presents arguments for the Dutch complementizers *of* and *dat* being specified for the features <C,disj>.

This sentence is three ways ambiguous, represented below using Larson (1985b)'s schematic representations:

(17) a. **narrow scope de dicto**: Mary is looking for ((a maid) or (a cook)).
b. **intermediate scope de re**: For some *x*, a maid or a cook, Mary is looking for *x*.
c. **wide scope de dicto**: Mary is looking for a maid or Mary is looking for a cook.

A similar sentence with *ba* in Bangla has at least the narrow and wide scope de dicto readings. The de re reading is greatly facilitated by accusative case marking on the disjunction phrase.

(18) a. narrow & wide de dicto:
Mary ek-ta radhuni ba kath-er mistiri khuj-che.
Mary one-CL cook or wood-GEN worker search-PRES.3P
'Mary is looking for ((a maid) or (a carpenter)).'
'Mary is looking for a maid or Mary is looking for a carpenter.'
b. de re:
Mary ek-ta [radhuni ba kath-er mistiri]-ke khuj-che.
Mary one-CL cook or wood-GEN worker-ACC search-PRES.3P
'For some *x*, a maid or a carpenter, Mary is looking for *x*.'

Thus, *ba* by itself has wide and narrow scope-bearing properties. Now, returning to PolQs containing a disjunction phrase headed by *ba*, we see that the scope properties of *ba* are not affected at all by the position of *ki* in the clause: both the questions below have both the wide and narrow de dicto readings available.

(19) a. Mary **ki** ekta [radhuni ba kather mistiri] khujche?
b. Mary ekta [radhuni ba kather mistiri] khujche **ki**?
'Mary is looking for ((a maid) or (a carpenter)).'
'Mary is looking for a maid or Mary is looking for a carpenter.'

What is *ki* doing in these sentences then? Our claim is that this *ki* is just the PolQ operator: it turns a declarative sentence like in (18a) into a polar question.[5]

This section argued that the appearance of *ki* in sentences with the logical disjunction connective *ba* does not mark the scope or have anything to do with the disjunctive phrase whatsoever. In the next few sections, we defend the other side of this claim: interrogative disjunction has everything to do with *ki*, and specifically, the head movement of *ki*.

2 Structural proposals

If *kina* both marks interrogative disjunction in AltQs as well as *whether*, what then are the structural differences that marks the two constructions as different? In this section, we take this question up. We will demonstrate how, keeping the CC in mind, we can derive both interrogative disjunction in AltQs and clause-final *whether* with the same item: *kina*.

[5]Many South Asian languages permit just rising intonation to mark a question (see Bhadra 2017) but the *ki* here really helps in parsing these *ba*-disjunction cases as questions.

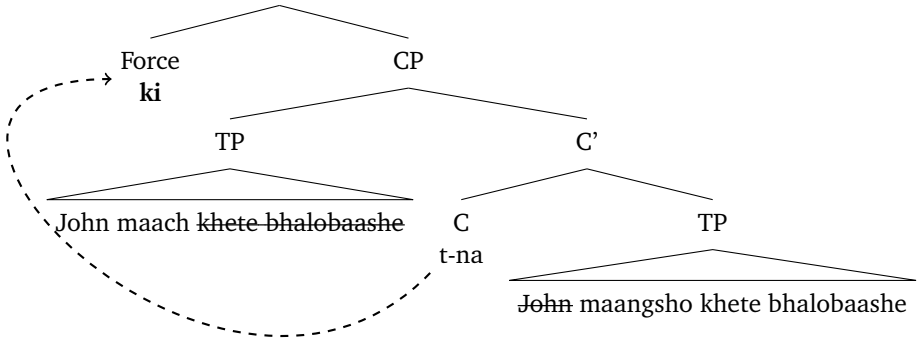
2.1 Interrogative disjunction: AltQs

Consider a matrix AltQ such as (14), repeated below:

(20) *John ki maach* ***na*** *mangsho khete bhalobaash-e?*
Ram KI fish NA meat eat-IMPV love-HAB
'Does John like to eat meat or fish?'

The underlying structure of this AltQ is provided below. The claim is that the disjunctive complementizer Q-Disj takes two clausal disjuncts as arguments. The Q-particle moves to a higher position, Force°, to mark the scope of the disjunction. This movement results in *na* being the surface disjunction connective. Deletion of material in both disjuncts follows - the subject in the second disjunct and the verbal complex in the first disjunct are elided.

(21)



Larson (1985b) made the influential claim that in English *whether…or* constructions, *whether* or a null operator is base-generated on the left edge of the disjunction phrase and moves to [Spec, CP] in order to mark the scope of the disjunction. The structure above is Larsonian in spirit in that there is movement for the purposes of marking the scope of disjunction. The actual implementation, however, has significant differences. In the following section, we briefly present the core analysis in Larson (1985b). Following which, we discuss in detail how our proposal differs from Larson in crucial ways. Consequently, we discuss how our proposal is able to account for critical empirical facts that Larson's account makes incorrect predictions for.

2.1.1 Larson (1985b)

In Larson's account, both *whether* and *either* are scope indicators of disjunction. Both elements move from a position adjoined to the disjunction phrase to a higher position which determines the point of interpretation of the disjunction. The crucial difference between *whether* and *either* in Larson's system lies in their featural specification: *whether* is [+WH] and thus the landing site of its movement is [Spec,CP]; *either* is [-WH] and hence adjoins to either IP or VP. This difference in landing sites is able to predict the ability of *whether* to designate the scope of disjunction in broader domains.

We concentrate on the *whether* constructions, given their direct relevance to the focus of this paper. Consider an example and a sample derivation in Larson's system.

(22) a. I know whether you want [coffee or tea].
b. *whether*/Q you want [__ coffee *or* tea]

The *whether* or a null operator is base-generated on the left edge of the disjunction phrase and moves to [Spec, CP] in order to mark the scope of the disjunction. The most crucial piece of evidence for Larson's claim comes from island-effects: questions with the associated disjunction phrase contained inside an island lack the AltQ reading.

In the constructions below, the disjunction phrase is inside a complex NP island (23), and inside a *wh*-island in (24) (Larson 1985b: 42, 44). In each case, the AltQ parse of the question is unavailable; only a PolQ parse is available. We provide below Erlewine and Kotek (2014)'s schematic representation of Larson's data:

(23) The decision [whether to believe [$_{ComplexNPisland}$ the claim that Bill resigned or retired]] is completely up to you.

a. Polar question parse:
the decision *whether*
to believe [$_{island}$ the claim that Bill resigned or retired], **or**
to not believe [$_{island}$ the claim that Bill resigned or retired]
b. * Alternative question parse
the decision *whether*
to believe [$_{island}$ the claim that Bill resigned], **or**
to believe [$_{island}$ the claim that Bill retired]

(24) I know [whether Bill wonders [$_{wh-island}$ who resigned or retired]].

a. Polar question parse:
I know *whether*
Bill wonders [who resigned or retired], **or**
Bill does not wonder [who resigned or retired]
b. * Alternative question parse
I know *whether*
Bill wonders [who resigned], **or**
Bill wonders [who retired]

The island-sensitivity of just the AltQ reading provides evidence for the claim that an operator-like element (*whether* or null *Q*) must be attempting to move out of the island. Larson argues that this movement is for delineating the scope of the disjunction. The reason why only the PolQ parse is not sensitive to islands is because the *whether*/*Q* operator originates in a different position in this case.

(25) Did John drink coffee or tea?

a. Op_i (t_i **or not**) [did John drink [Op_j coffee or tea]] PolQ
{John drank coffee or tea, John didn't drink coffee or tea}

In this PolQ configuration, Larson argues, the *whether*/*Q* is generated as an adjunct to an overt or covert *or not* phrase and moves to [Spec, CP] from there. The disjunction lower in the structure has an operator of its own to mark the scope locally. This is the crux of the reason why a PolQ parse is not sensitive to islands, and is available where the AltQ reading is not.

In unembedded AltQs such as *Did John drink tea or coffee?*, there is no overt *whether* phrase; yet, the AltQ reading is derived via the movement of something. Larson claims that this something is the null operator *Q*. In questions with associated disjunction but no overt *whether*, this null operator *Q* fulfills the same function as an overt *whether*. Han and Romero (2004b) schematically represent this analysis as follows, with 'Op' standing for *Q*.

(26) Did John drink coffee or tea?

a. Op_i [did John drink [t_i coffee or tea]] AltQ
{John drank coffee, John drank tea}

This account works for the English paradigms that Larson investigates. It is pertinent to note here that Han and Romero (2004b) argue for a similar Larsonian operator movement treatment of the Hindi polar Q-particle *kyaa* vis-a-vis AltQs. They provide arguments for the claim that disjunction in Hindi AltQs is assigned scope via the movement of the operator *kyaa* to a higher position. An operator movement analysis thus appears to work for both the English and Hindi facts. In the next section, we discuss how such an approach is untenable for Bangla.

2.1.2 Problems adopting an operator movement approach

The paradigm in (3)-(4) above demonstrated that Bangla AltQs are systematically ungrammatical when embedded with *whether*. Without the *whether*, embedded AltQs are perfectly grammatical. An operator movement analysis, where *whether* or null *Q* moves from the left edge of the embedded disjunction to a higher position, cannot explain why *kina* and the disjunction phrase [*cha na coffee*] cannot co-occur. In the current proposal, for AltQs to be embedded under rogative predicates with *kina*, the structure would conceivably have to be able to accommodate two disjunctive complementizers under the same projection, leading to both a syntactic as well as a semantic crash.

The second incorrect prediction that adopting an operator movement analysis for Bangla would lead to is with respect to the free adjunction of the phrase *or not*. The status of the *or not* phrase in English is that of an adjunct. Given its adjunct status, Larson assumes that its characteristic property is free attachment at any point in the derivation. This property explains the ambiguity of sentences like the one in (27), which Larson represents as follows.

(27) I know whether John claimed that Bill left or not.

a. $[_S\ [_{COMP}$ $whether_i]$ e_i $[_S$ John claimed [that Bill left]] **or not**]
b. $[_S\ [_{COMP}$ $whether_i]$ $[_S$ John claimed [t_i [e_i Bill left **or not**]]]]

In (27a), *or not* is adjoined to the higher clause, and *whether* is adjoined to it, from where it moves to its higher scope position. The resulting disjunction is in the higher clause: John

claimed that Bill left or John didn't claim that Bill left. In (27b), the adjunct *or not* is adjoined to the lower clause, and *whether* originates adjoined to it, and moves to the C domain. As a result, the disjunction is in the lower clause: John claimed that Bill left or John claimed that Bill didn't leave.

This kind of ambiguity is unavailable in Bangla. The Bangla counterpart of (27)[6] is not ambiguous between the two readings.

(28) a. *Ami jani Bill jaan-te chai-chilo Mary cho-le ge-che kina.*
I know Bill know-IMPV want-PAST.3P Mary go-IMPV go-PERF KINA

b. I know Bill was wondering if Mary left or Mary did not leave.

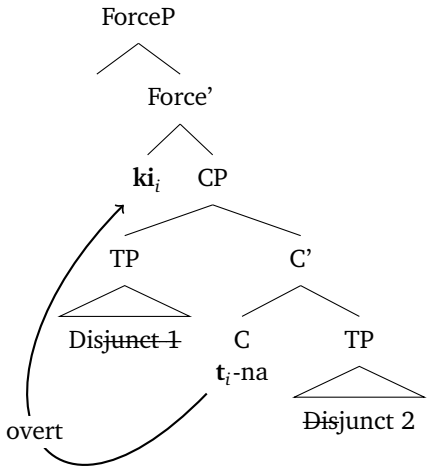
c. # I know Bill was wondering if Mary left or Bill was not wondering if Mary left.

This analysis would therefore overgenerate in Bangla. If we treated *kina* as an adjunct phrase, the lack of ambiguity and the unavailability of (28c) would remain unaccounted for. In the next section, we will put forward a head movement analysis and demonstrate that it is able to achieve unification across the three constructions and make several accurate predictions as well.

2.2 Proposal: Interrogative disjunction involves Head Movement

Earlier sections of this paper proffered the claim that *kina* is a disjunctive complementizer that solely disjoins clausal constituents. Abstractly represented, we propose that the structure of a matrix AltQ would look like the following:

(29) **Matrix interrogative disjunction**



The Q-Disj complex *kina* is generated as a disjunction head. *Ki* moves out of *kina* to a higher position (cf.Larson 1985b and Han and Romero 2004b), leaving *na* behind as the surface instantiation of the connective. Note that the landing site of this movement is the Force head. This is in line with previous proposals discussed above (Jayaseelan 2001, 2008, Bhatt and

[6]'Claim' is replaced by the rogative predicate 'want to know/wonder' since we are dealing with interrogative disjunction here.

Dayal 2014, 2017) that locate such Q-particles in the Force projection. In addition to the movement of *ki*, there is backward gapping in the first disjunct, and ellipsis of the subject in the second disjunct.[7] The partial strikethroughs represent these deletions. We are assuming that focussed constituents in each disjunct survive ellipsis (via the Focus Deletion Constraint (Han and Romero 2004a), discussed in Section 5.2). An empirical illustration is provided below:

(30) *ki*$_i$ *[John maach ~~khe-te~~ ~~bhalobaash-e~~]* t$_i$-*na* [*~~John~~ maangsho khe-te*
KI John fish eat-IMPV love-HAB NA John meat eat-IMPV
bhalobaash-e]?
love-HAB
'Does John like to eat fish or meat?

The deletion is optional in both the disjuncts, permitting structures where all of the material are pronounced. That leads to a high amount redundancy in the discourse, but not to ungrammaticality per se.

Hence, there are already two crucial departures from an operator movement analysis- (i) We are not assuming that *ki* is generated at the left edge of the disjunction phrase, but within it, and (ii) it is head-movement and not phrasal movement to Force° that results in a disjunctive configuration.

Given the link between Q-particles and disjunction explored above, it is not surprising that in the *ki* + *na* complex, it is the *ki* that moves to mark scope, and not *na*. Its [+Q] quality allows it to undergo the head movement for scope. At the PF interface, the Force head can be optionally spelt out as *ki* or left unpronounced, without affecting the grammaticality of the AltQ:

(31) *[John (ki) maach ~~khete~~ ~~bhalobaash-e~~]* ***na*** *[~~John~~ mangsho khete*
John KI fish eat-IMPV love-HAB t$_{OP}$-NA John meat eat-IMPV
bhalobaash-e?
love-HAB
'Does Ram like to eat meat or fish?'

2.2.1 Locality

The operator analysis has an important prediction. Since *whether* is a *wh*-phrase, it should be able to move successive cyclically, expanding the scope of disjunction. Larson shows that this prediction is borne out: even if the disjunction phrase is embedded under multiple complement clauses, the embedded AltQ parse is still available. This gives us two possible readings for the following fragment:

[7] We are assuming an EPP feature on *ki* (following Bhadra 2017, who investigates *ki*'s complete avoidance of the clause-initial position), which is satisfied after its movement; this is not shown for most of the examples.

(32) The decision whether to believe that Bill resigned or retired . . .

a. [whether to believe Bill resigned or retired] or [whether not to believe Bill resigned or retired]

b. whether to [believe Bill resigned] or [believe Bill retired]

If we adopt such an analysis for Bangla, we predict that operator movement should yield ambiguity with a similar fragment. However, this prediction is not borne out. Below are two examples where the disjunction is embedded under a rogative predicate, and in both, only the reading corresponding to the disjunction of the lowest clause is available. The higher clause disjunction reading is unavailable.

(33) *Ami jani Bill jaan-te chai-che je [John podotyaag kore-che] na [~~John~~*
I know Bill know-IMPV want-PRES.3P that John resign do-PERF.3P NA John
ritayar kore-che]?
retire do-PERF.3P
'I know that Bill is wondering did John resign or retire?
'I know whether or not Bill is wondering if John will resign or retire'
(wide scope disjunction)

This availability of only the lower clause interpretation can be accounted for by the head movement analysis. A cross-linguistically attested feature of head movement is its strictly local nature, usually characterized by the lack of successive cyclicity. *Ki* moves only to the closest possible Force head - the lower clause one (as represented by the arrow). The impossibility of *ki* moving to the higher Force head by skipping over the lower one results in the impossibility of the higher clause disjunction reading. Thus, the head movement analysis, and not an operator movement analysis, correctly predicts that an AltQ in Bangla with an embedded disjunction cannot ever have the wide scope alternative reading.

The locality constraint on head movement at play here is one familiar from the literature:

(34) **Head Movement Constraint** (Travis 1984)
An X° may only move into the Y° which properly governs it.

In modern syntactic terms, this amounts to a structural head-adjacency configuration. We follow Harizanov and Gribanova (2016) in assuming that:

(35) Two heads are structurally adjacent if one of them heads the complement of the other.

The disjunctive complementizer *kina* is structurally adjacent to the lower Force head, under this definition. Obeying the HMC then, *ki*'s movement is restricted to the structurally adjacent head.

The operator analysis proposed in Larson is provided support by the sensitivity of the AltQ reading in English to the presence of island boundaries. A constraint like the HMC is certainly a

much stronger constraint in that it imposes a structural adjacency restriction on the movement of heads. The current proposal of head movement thus automatically predicts that Bangla AltQs should also be sensitive to island boundaries, given the compliance with the stronger HMC. This prediction is borne out: the AltQ parse is unavailable when the disjunction is contained inside an island.

(36) Complex NP island (Larson 1985b)

a. **Ami [Bill podotyaag ~~kore-che~~] na [~~Bill~~ ritayar kore-che] ei dabi-ta]*
I Bill resign do-PERF.3P NA Bill retire do-PERF.3P this claim-CL
bishyash kora-r sidhyanto-ta tomar upor chere dil-am
believe do-GEN decision-CL your on leave give-1P
Intended: ...to believe the claim that Bill resigned or to believe the claim that Bill retired...

(37) Relative Clause island (Beck and Kim 2006)

a. **Mira ki ekta train khuj-che [$_{island}$ jeta Burdwan ~~jay~~ na ~~jeta~~ Malda jay]?*
Mira KI one train search-PRES.3P which Burdwan goes NA which Malda goes
Intended: 'Is Mira looking for a train which goes to Burdwan or to Malda?'

This display of island effects in Bangla: (i) provides evidence for the claim that the relevant movement occurs in the narrow syntax, and (ii) is compatible with the existence of a stricter locality constraint that subsumes island boundaries. We conclude that AltQs in Bangla involve movement of *ki* to Force in the narrow syntax leaving *na* behind in the disjunction phrase.

At this juncture, it is imperative to briefly discuss the theoretical underpinnings of the phenomenon of head movement. There is a vast literature that treats phenomena related to both word order (verb-initiality, verb-second, etc.) and word formation (affixation, compounding, etc.) as both belonging under the umbrella term of 'head movement'. In addition, numerous studies have disagreed on whether head movement is part of the narrow syntax (Matushansky 2006) or a post-syntactic operation (Chomsky 2000, 2001, Harley 2004, among others) or plain phrasal movement (Koopman and Szabolcsi 2000). Harizanov and Gribanova (2016) argue that all these studies have shown that head movement is characterized by diverse properties and should be categorized into two camps:

(38) **Two types of head movement** (Harizanov and Gribanova 2016)

a. **Purely syntactic head movement** (Internal merge in syntax)
- does not form words
- can 'skip' heads
- can have interpretive effects affecting scope, NPI licensing, etc.

b. **Post-syntactic amalgamation** (Morphological Merger in post-syntax)
- forms words

- affects structurally adjacent heads
- does not have interpretive effects

With regards to *ki*'s movement, we see that it shares properties from both of Harizanov and Gribanova (2016)'s camps. We have argued that *ki*'s island-sensitivity is a reflection of the occurrence of the movement in the narrow syntax. In addition, its function is not to form words; and it most definitely has interpretive effects, i.e. affecting disjunction scope. Thus, it shares some crucial properties with the pure syntactic movement camp under head movement.

However, it cannot 'skip heads' as we saw, and thus inherently obeys the HMC. In this characteristic, it falls in the 'amalgamation' camp in Harizanov and Gribanova (2016)'s characterization. In essence, this is the only property of *ki*'s movement that overlaps with this camp, given that *ki* does not form new words via movement and has interpretive effects.

Essentially then, with properties that overlap with both movement in the narrow syntax and compliance with a structural adjacency constraint like the HMC, we propose that *ki*'s movement be termed a 'hybrid' head movement. This characterization helps us understand why successive cyclicity is excluded from the Bangla AltQ configuration, as well as why an AltQ reading is unavailable when the disjunction is contained within an island.

The discussion across the last few sections pointed to an underlying fact: the Q-particles in the two closely-related languages - Hindi and Bangla - function as scope indicators of interrogative disjunction. This similarity strengthens Jayaseelan (2001, 2008)'s claim that Universal Grammar does encode a non-trivial relationship between the two categories.

2.3 Disjunctive subjects are impossible in Bangla AltQs

Till now, we have explored cases of clausal disjunction or disjunction inside the verbal domain. Turning our attention, we see that languages of the world prolifically disjunctive subjects in AltQs.

(39) Did [Mary or John] finish the paper?

(Han and Romero 2004b: 88)

(40) *[Ali mi] [(yoksa) [Ayse mi]] kahve içti?* TURKISH
Ali Q not-if Ayse Q coffee drank
'Was it Ali or Ayse who drank coffee?

(Gračanin-Yuksek 2016: 14a)

Interestingly, Bangla does not allow disjunctive subjects:

(41) a. **Ann na Bill piano baja-y?*
Ann NA Bill piano play-HAB
Intended: 'Does Ann, or Bill play the piano?'

b. **Tor ma na baba shundor?*
Your mom NEG dad beautiful
Intended: 'Is your mom, or dad good-looking?'

These predictably become grammatical as soon as the whole clauses comprising the disjunction are pronounced:

(42) *Ann piano baja-y na Bill piano baja-y?*
Ann piano play-HAB NA Bill piano play-HAB
'Does Ann play the piano or does Bill play the piano?

We argue that the ungrammaticality of disjunctive subjects can be explained only under the movement account laid out above. The movement analysis argued that *ki* moves out of the *kina* complex to a higher position to mark the scope of disjunction. In an AltQ with a disjunctive subject, this movement would look like the following:

(43) *Ki Ann *t*-na Bill piano bajay?

The result would be a question in which polar *ki* finally ends up being clause-initial. Such a construction is ungrammatical in Bangla. Bhadra (2017) shows that the polar particle *ki* (not the homophonous thematic *wh*-word *ki*), like several other particles in Bangla, cannot appear in a clause-initial position. This is shown in (a) below. In (b), as soon a constituent appears to the left of *ki*, the structure becomes grammatical.

(44) a. **Ki Ram bhaat kheye-che?*
Q Ram rice eat-PERF.3P
Intended: 'Did Ram eat rice?'

b. *Ram ki bhaat kheye-che?*
Ram Q rice eat-PERF.3P
'Did Ram eat rice?'

Bhadra (2017) argues these particles come with an [+EPP] feature, and some XP moves to the specifier position to satisfy the EPP. We adopt the same position here. (43) is ungrammatical because the EPP feature of the moved *ki* is not satisfied.

The structure for (43) is given in (45a). The EPP being unsatisfied makes the derivation crash. The disjunctive phrase being the closest goal, it moves to the specifier of *ki*, as shown in (45b). However, given that after *ki* has moved out of the disjunctive phrase to Force, it is the remnant phrase that undergoes this movement to Force's specifier, *ki* ends up not c-commanding its trace. This results in the crash of the derivation. The movement analysis,

thus, is able to predict this ungrammaticality. Without assuming the movement of *ki*, there is no obvious way to explain what prevents disjunctive subjects in Bangla AltQs.

(45) a. *__ki__ [Ann __t__-na Bill] piano bajay?

b. *[Ann t_i-na Bill]$_j$ ki_i t_j piano bajay?

This analysis predicts that if any other constituent apart from the disjunctive phrase moves to satisfy the EPP, the structure would be grammatical. This prediction is borne out:

(46) *Piano$_j$ ki$_i$ [Ann t_i-na Bill] t_j bajay?*
piano Q Ann t-NA Bill play-HAB
'As for the piano, does Ann or Bill play it?'

2.4 Proposal: Clause-final *kina* derived via ellipsis

As we saw in previous sections, the Q-Disj complex can appear clause-finally and denote a clausal disjunction akin to English *whether*. When denoting *whether*, the disjunctive complementizer denotes a disjunction between a full clause and its negative counterpart, where the latter is completely elided under identity with the former. In addition, the negation *na* in the second disjunct is elided under identity with the *na* inside the *kina* complex. This is the situation in which we get clause-final *kina*. Maintaining congruity between this clause-final *kina* and the interrogative disjunction structures above, we argue that the head-movement of the Q-particle *ki* to the Force projection still happens covertly. A sample illustration is provided below:

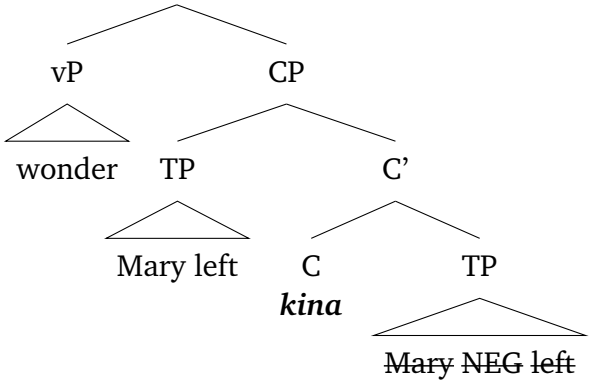
(47) [*Ma jiggesh kor-chilo [Bill-er John-ke podotyaag kor-te bola uchit]* ***kina***
Ma ask do-PAST.3P Bill-GEN John-GEN resign do-IMPV say should KINA
~~*[Bill-er John-ke podotyaag korte bola uchit na]*~~
Bill-GEN John-GEN resign do-IMPV say should NEG
'Mom was asking whether (or not) Bill should ask John to retire.'

The structure in (47) would be the underlying representation of the Q-Disj complex in both sentences such as (2b) (where it is *whether or not*) and (2a) (where it is *whether*).

This analysis puts the following claim front and center: the phrases *whether* and *whether or not* are identically signified in Bangla (with the Q-Disj complex), with no syntactic or semantic difference whatsoever. This claim had been made for English many decades ago. Larson (1985b) cites Karttunen (1977) as the first widely popular account within the Montague Grammar framework to claim that the phrase [*whether* α] denotes the set of propositions {p: p is true & [$p = q \vee p = \neg q$]}, where q is the proposition expressed by α. Thus, the semantics of *whether* involves the disjunction of a proposition and its negation.

In (33), we saw that a high scope disjunction reading is not possible in Bangla, and assuming a free adjunction analysis of the *or not* phrase overgenerates.[8] Our analysis of *kina* as a left-merging head functioning as the disjunction connective can correctly capture the lack of ambiguity. Structurally, deriving the lower clause disjunction would look like the following:

(48)



The second disjunct is elided under identity with the first disjunct. The remnant in the elided phrase is the NEG, which gets deleted under identity with the *na* fragment of *kina*.[9] Thus, we end up with a structure in which the lower clause has been disjoined with *kina* and the second disjunct has ben elided, leaving *kina* in a clause-final position on the surface.

The higher clause disjunction reading is ungrammatical in Bangla.

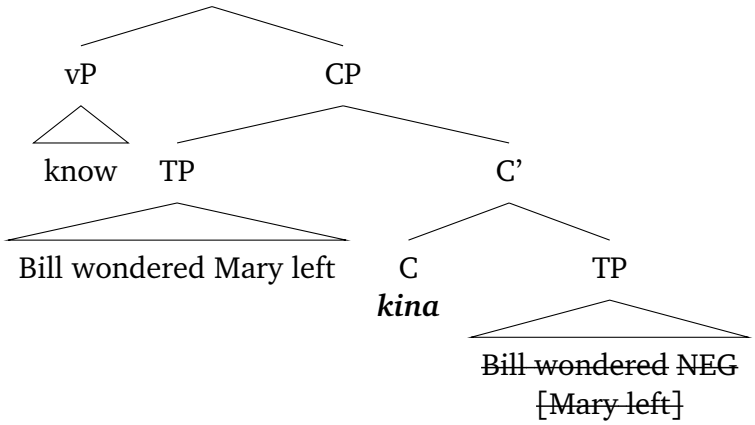
(49) * *Ami jaani [Bill jaan-te chai-chilo [$_{TP}$ Mary cho-le geche]] kina [Bill*
I know Bill know-IMPV want-PAST.3P Mary go-IMPV go-PERF KINA Bill
jaan-te chai-chilo na [$_{TP}$ Mary cho-le ge-che]]
know-IMPV want-PAST.3P NEG Mary IMPV go-PERF
Intended: 'I know whether Bill was wondering or not if Mary left.'

The structure for such a reading would have to look like the following:

[8] Han and Romero (2004b) proffer two solutions for such ambiguity as well - polarity raising + Right Node Raising or ellipsis + fronting of a remnant phrase. Both of these solutions would overgenerate for Bangla as well, given that the *or not* can disjoin clauses at all possible heights.

[9] Bangla negation is complicated in terms of the surface forms and correlations with tense and aspect (Ramchand 2004). Without going into those details, we assume an abstract negation feature is getting deleted here, also strictly under identity with the morphological negation *na* inside *kina*.

(50)



In this case, the crucial problem arises from the fact that ellipsis appears to be happening across a finite clause boundary. The predicate *jaante chaichilo* ('was wondering/wanting to know') has a finite complement 'Mary has left'; in the second disjunct, the ellipsis appears to be occurring across this finite clause.

The ban on ellipsis occurring across finite clause boundaries has long been noted. Kuno (1976) notes that in an embedded infinitival context such as in (51), the matrix as well as the embedded predicate can be elided.

(51) Mary [forced Tom [to go to Cambridge] and [~~forced~~ John [[~~to go~~ to Oxford]].

Terazu (1975), as cited in Fukui (2006), notes that the matrix predicate and a complement NP can also get deleted under identity:

(52) Ugliness[is one of [the symptoms of disease]], and beauty [~~is one of [the symptoms~~ of health]].

Across a finite clause boundary, however, ellipsis is not possible, as noted by Abe and Hoshi (1997):

(53) *John thinks that Bill will see Susan and Harry [~~thinks [that Bill will see~~ Mary]].

Schwarz (1999), citing Neijt (1979), notes that the exact same constraint applies for gapping in regular as well as in *either…or* constructions.

(54) Schwarz (1999): (61)

a. *[The first letter says that you should pay tax] and [the second letter ~~says [that you should pay~~ V.A.T]].

b. ?? Either [Bill said that Mary was drinking] or [~~Bill said [that Mary was~~ playing video games].

In the same vein, Barros (2014) demonstrates that multiple sluicing is impossible when the remnants correspond to correlates that are separated by a finite clause boundary:

(55) * Some students said that Mary will speak to some professors, but I can't remember which students$_i$ ~~t_i said that Mary will speak t_j~~ to which professors$_j$.

The situation is no different in Bangla. Replicating (53) in Bangla leads to ungrammaticality as well:

(56) * *John bha-be [je Bill Susan-ke dekh-be] aar Harry [~~bha-be~~ [~~je~~ ~~Bill~~]*
John think-FUT.3P that Bill Susan-ACC see-FUT.3P and Harry think-FUT.2P that Bill
Mary-ke [~~dekh-be~~].
Mary-ACC see-FUT.3P
'John thinks that Bill will see Susan and Harry (thinks that Bill will see) Mary.'

Given these facts, it is transparent why a structure like the Bangla one in (49) above leads to a crash. The higher clause disjunction with *kina* in such a multiply embedded structure is ruled out by independent conditions on ellipsis. This proposal thus explains the lack of ambiguity in Bangla. This further strengthens the claim that the concatenated disjunction connective is actually *kina*, which we argued to be a left-merged disjunctive complementizer head in the language. When embedded under rogative and other *whether*-embedding predicates, *kina* appears to function like *whether* because, like *whether or not*, it underlyingly disjoins the complement clause of the predicate and its negative counterpart. This is in alignment with how we conceptualize the semantics of *whether* and *whether or not*.

The central tenet of the previous sections was to defend, from a syntactic perspective, the claim that an expression denoting embedded clausal alternatives, such as *whether*, and a form of disjunction resulting in alternative questions, such as interrogative disjunction, are underlying the same element in Bangla. The contribution of the following sections will be to defend that claim in the compositional semantics module as well.

3 Alternative Semantics

3.1 Main technology

Hamblin (1973)'s main innovation was an analysis of questions in a system where the unique semantic value of all expressions are sets of alternatives, which then combine compositionally with other elements. This insight has been the foundation stone of Alternative Semantics, also called Hamblin semantics.

Beginning somewhat abstractly with Partee and Rooth (1983), the standard denotation of disjunction (Von Stechow 1991, Aloni 2003, Simons 2005a, Alonso-Ovalle 2006) is the computation of alternatives. The lexical item *or* introduces a set of alternatives into the derivation, which is the union of the denotation of each of its disjuncts:

(57) $[\![[\text{X or Y}]]\!]^{g,c} =_{def} [\![\text{X}]\!]^{g,c} \cup [\![\text{Y}]\!]^{g,c}$

(58) a. $[\![\text{meat}]\!]^{g,c} = \{\text{meat}\}$

b. $[\![\text{fish}]\!]^{g,c} = \{\text{fish}\}$

c. $[\![[\text{meat or fish}]]\!]^{g,c} = [\![\text{meat}]\!]^{g,c} \cup [\![\text{fish}]\!]^{g,c} = \{\text{meat, fish}\}$

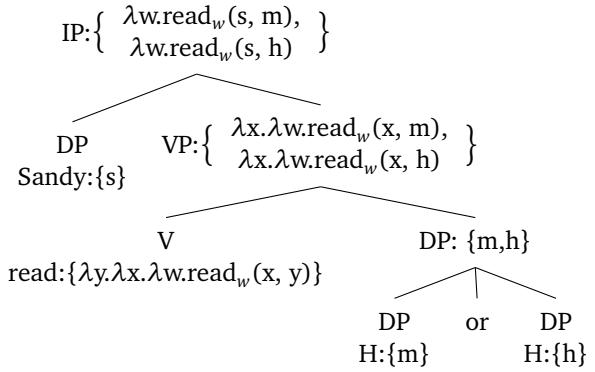
This resultant set of alternatives can then be manipulated by a variety of Hamblin operators which collect the alternatives and turn them into meanings more compatible with our traditional conceptions. Until such operators are made available in the derivation, the alternatives keep 'expanding' via a special compositional rule.

This special compositional rule is *Pointwise Functional Application* (PFA): objects of type $\langle\sigma, \tau\rangle$ apply to objects of type $\langle\sigma\rangle$ and the output of this application are collected in a set:

(59) If $[\![\alpha]\!] \subseteq D_{\langle\sigma,\tau\rangle}$ and $[\![\beta]\!] \subseteq D_{\sigma}$, then
$[\![\alpha(\beta)]\!] = \{ c \in D_{\tau} \mid \exists a. \in [\![\alpha]\!] \exists b. \in [\![\beta]\!] (c = a(b)) \}$ (Hamblin 1973)

Successive applications of PFA enable the alternatives that have been introduced by elements like 'or', indeterminate pronouns, etc. in a sub-part of the tree to expand into alternatives of higher types. Alonso-Ovalle (2006):(30) illustrates this process for the sentence with a disjunction in the object position: *Sandy read Moby Dick or Huckleberry Finn*.

(60)



We see the recursive application of PFA here. The verb itself denotes a singleton set - the 'property' of reading, as do the individual disjuncts themselves as well the subject. The disjunction connective *or* collects the alternatives, following which the singleton set in V combines with the alternative set via PFA, expanding the alternatives. The subject combines in the same manner, turning what were originally individual alternatives into propositional alternatives. If two singleton sets have to combine, they compose via the traditional Fregean Functional Application.

(60) is the illustration of a simple sentence. What happens when operators that can manipulate alternatives are introduced into the derivation? These operators select the

alternative set and usually return a singleton set. Since alternatives can have the types of individuals, properties or propositions, the operators that manipulate them have to have matching types. Kratzer and Shimoyama (2002) provide a list of the most common operators: ∃, ∀, Neg, Q. These operators can be propositional operators or generalized quantifiers, and combine with the appropriate type of alternatives.

With regards to boolean disjunction, it is standardly assumed that the operator manipulating the alternatives introduced by *or* is an Existential Closure operator. This operator returns a singleton set containing the proposition that is true in a world *w* iff at least one of the alternatives in the alternative set is true in *w*. Following Rooth and Partee (1982), Kratzer and Shimoyama (2002) define the existential operator as:

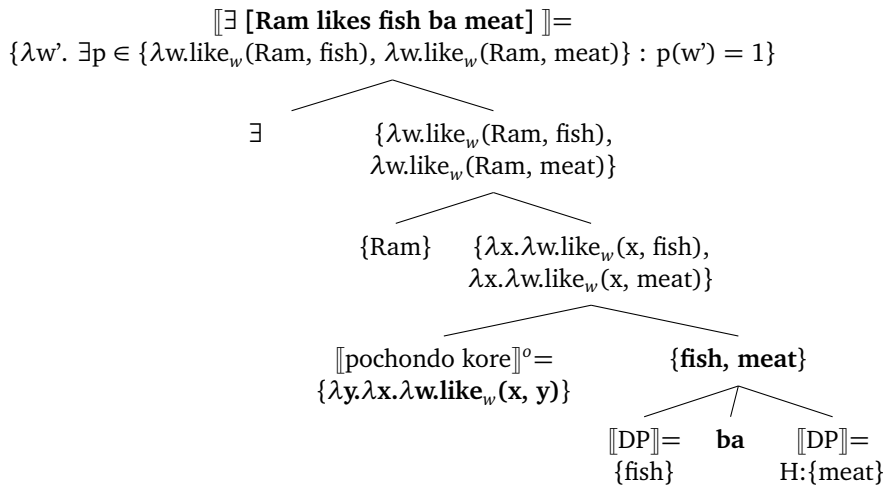
(61) $[\![\exists\alpha]\!] = \{\lambda w.\ \exists p \in [\![\alpha]\!]:\ p(w) = 1\}$

This operator brings us to the classical existential conception of disjunction.

We have seen that boolean and interrogative disjunction are marked differently in Bangla, unlike English. Many other languages have been reported to have this distinction within the disjunction system: Amharic, Syrian Arabic, Basque, Buriat, Finnish, Gothic, Kannada, Korean, Latin, Lithuanian, Mandarin, Sinhala, Vietnamese, and Yoruba (cf. Moravcsik 1971; Alonso-Ovalle (2006); Slade (2011) Winans (2012), Mauri and van der Auwera (2012), inter alia).

Boolean disjunction in Bangla is marked by the connective *ba*. For a declarative with a disjunction such as *John maach ba maangsho pochondo kore* (John likes fish or meat), the Existential Closure operator takes the alternatives introduced by *ba* and returns a singleton set:

(62)



In a language like English, interrogative and boolean disjunction are denoted by the same connective: *or*. Thus, a derivation like (62), with ∃ replaced by a Q operator, would be what interrogative disjunction would look like. The result would be a return of the exact same set (since the function of Q is to leave the alternatives intact) - {λw.like$_w$(Ram, fish), λw.like$_w$(Ram, meat)}.

Crucially, in such a set up, there is no real distinction between interrogative and boolean disjunction. *Or* in both cases introduces a set of alternatives into the structure that is manipulated either by the existential closure operator (resulting in a singleton set) or by a

Q operator (resulting in a non-singleton set). Adopting this setup, one cannot explain why *ba* is permitted only in declaratives, while *kina* as a disjunction operator is only permitted in questions.

In the next section, we explore an alternate conception of disjunction - a pointwise computation of Rooth-Hamblin focus alternatives, to help account for distinctions within the disjunction space.

3.2 Focus alternatives

3.2.1 Von Stechow (1991), Beck (2006a), Erlewine (2017)

Von Stechow (1991), and following him, Beck and Kim (2006), argue for a analysis of disjunction in which *or* has both an ordinary semantic contribution as well as a focus semantic contribution. The ordinary value is the classical disjunction formulation, while the focus value is an alternative set formed out of the ordinary meanings of the disjuncts. In an AltQ, then, the Q operator takes the focus semantic value and outputs an ordinary question meaning. For example, consider the following illustration from Beck and Kim (2006):

(63) a. Did the program execute or the computer crash?

b. $[\![\text{DisjP}]\!]^o = \{\lambda w.$ the program executed in w or the computer crashed in w$\}$

c. $[\![\text{DisjP}]\!]^f = \{\lambda w.$ the program executed in w, $\lambda w.$ the computer crashed in w$\}$

(64) $[\![\text{Q } \phi]\!]^f = \{[\![\text{ Q } \phi]\!]^o \}$

In this system too, we cannot find a locus of distinction between logical and interrogative disjunction. Both types of disjunctions would arguably project focus alternatives, which are then manipulable by Hamblin operators. So essentially, while the basic tenet of projected focus alternatives can be upheld, the space of disjunction does not appear to be amenable to further refinement.

A recent analysis proffered by Erlewine (2017), studying disjunction in Mandarin Chinese, is especially catered to accounting for distinctions within the disjunction space. Consider the paradigm below:

(65) a. *haíshi* ⇒ alternative question
Zhang San xihuan Li Si ***haishi*** *Wang Wu (ne)?*
Zhang San like Li Si HAISHI Wang Wu NE
'Does Zhang San like [Li Si] or [Wang Wu]?

b. *huòzhe* ⇒ boolean disjunction
Zhang San xihuan Li Si ***huozhe*** *Wang Wu.*
Zhang San like Li Si HUOZHE Wang Wu
'Zhang San likes Li Si or Wang Wu.'

Erlewine's crucial distinction between the two kinds of disjunction lies in the contrast between their ordinary and focus semantic contributions. In his analysis, both disjunctors come with a *junctor head* J (following Dikken 2007) whose function is to collect ordinary values of disjuncts into a set of alternatives (superscripted as "alt").

(66) The semantics of J:

a. $[\![\text{ J } x_1, \ldots, x_n]\!]^o$ = undefined

b. $[\![\text{ J } x_1, \ldots, x_n]\!]^{alt} = \{[\![x_1]\!]^o, \ldots, [\![x_n]\!]^o\}$

What divides the two disjunctors is the requirement of an existential closure operator ∃ by the boolean disjunctor *huozhe* that is not the case with the interrogative disjunctor *haíshi*. This requirement is enforced in syntactic terms: *huozhe* comes from the lexicon with an uninterpretable feature [u∃] on the J which has to be checked via AGREE. Coming to the interrogative disjunction *haíshi*, it does not have the uninterpretable feature [u∃], and thus free adjunction of ∃ is prohibited. Thus, an AltQ with *haíshi*, such as (65a), has an undefined ordinary meaning and a well-defined focus value (intensionalized denotations are from the original work):

(67) a. $[\![\text{TP}]\!]^o$ undefined

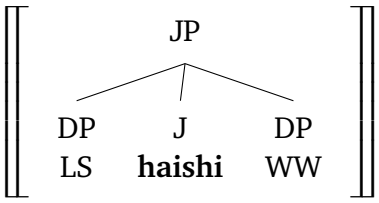
b. $[\![\text{TP}]\!]^f = \{\text{like(ZS,LS)}, \text{like(ZS,WW)}\}$

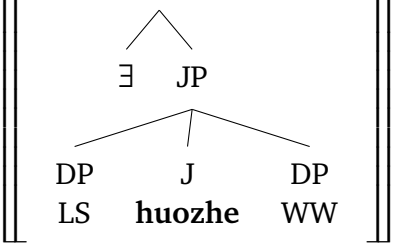
Adhering to Beck (2006a)'s Principle of Interpretability, a Q-like operator now merges and lifts focus values into ordinary values (in the tradition of Rooth 1992, Ramchand 1997, Beck 2006a, Beck and Kim 2006, among many others). There is an important consequence of such a formulation of the boolean-interrogative distinction, which we discuss next.

3.2.2 Neutralization of differences

Recall that both disjunctors - *haíshi* and *huozhe* - in Erlewine's system crucially share a common core that gives them the identity of being disjunction connectives: a J(unctor) that generates focus alternatives based on the disjuncts. Erlewine demonstrates that *Li Si haishi Wang Wu* and *Li Si huozhe Wang Wu* have the exact same focus alternatives:

(68) Erlewine (2017): (39b, 40b; with some modifications)

a. $[\![$  $]\!]^f = \{LS, WW\}$

b. $[\![$ 

$]\!]^f = \{LS, WW\}$

The operator ∃ that is featurally needed in the latter case in this system, as seen in the previous section, does convert the focus value into an ordinary set, but does not obliterate the alternative set in the process; instead, it just "passes up the alternative set of its complement" (Erlewine 2017: p.22). This means that applying ∃ to (68b) will not yield anything different from (68b) and (68a). All these sets are exactly the same. What does this buy us? This buys us interchangeability between *haíshi* and *huozhe* in the scope of any operator that only cares about the focus alternative set of a disjunctor. Such an operator would not be able to distinguish between boolean and interrogative disjunction because it only sees the focus alternative sets - i.e. (68a) and (68b) - of the two elements, which are identical. Thus, differences in the disjunction space would stand 'neutralized' in such environments.

Adopting Erlewine's proposal for our Bangla disjunction facts would entail that the difference between *ba* and *kina* should be neutralized in the scope of such operators as well. This prediction is not borne out. In Mandarin, in such configurations, the *haíshi* loses its AltQ reading and becomes interchangeable with *huòzhe* in such contexts.[10] In Bangla, the interrogative disjunction is just plain banned from appearing in some contexts; in others, even if it can appear, it retains the AltQ reading and is certainly not interchangeable with *ba*. We present a few representative examples of neutralizing environments (see Lin 2008, Huang 2010, Erlewine 2017 for a more extended list of such configurations).

(69) **Under an epistemic modal**

a. *Ram Sita-ke ba Surponokha-ke bhalobesh-e thak-te paare.*
Ram Sita-ACC or Surponokha-ACC love-IMPV stay-IMPV can
'Ram may have been in love with Sita or Surphonokha.'

b. *Ram (ki) Sita-ke na Surponokha-ke bhalobesh-e thak-te paare?*
Ram Q Sita-ACC NA Surponokha-ACC love-IMPV stay-IMPV can
'Can it be the case that Ram is in love with Sita, or Surponokha?' **(only AltQ)**

(70) **Strong negative adverbs**

[10]There is considerable speaker variation with regards to the judgements. A regional difference at play here between speakers from mainland China (who reject attempts at interchanging *haíshi* and *huozhe*), and speakers from Taiwan (who allow interchangeability) (R. Huang, p.c.).

a. *Baba konodino amake ba amar bhai-ke boke-n-ni.*
father never me or my brother-ACC scold-HON-NEG
'My father never scolded me or my brother.'

b. *Tomar baba ki konodino tomake na tomar bhai-ke boken-ni?*
your father Q never you NA your brother-ACC scold-HON-NEG
'Did your father never scold you, or your brother?' **(only AltQ)**

(71) **Non-factive adversative predicates**

a. *Ami amar baba-r ba amar ma-er amar sathe kotha bola-r onurodh protyakhyan kore diye-chi.*
I my father-GEN or my mother-GEN my with talk say-GEN request deny do give-1P
'I have denied my father's or my mother's request to talk to me.'

b. *Tumi ki tomar baba-r na tomar ma-er tomar sathe kotha bolar onurodh protyakhyan kore diyecho?*
You Q your father-GEN or your mother-GEN your with talk say-GEN request deny do give-2P
'Did you deny your father's, or your mother's request to talk to you?' **(only AltQ)**

(72) **Imperatives**

a. *Phol ba shobji kha-o shorir thik kora-r jonno.*
fruit or vegetable eat-2P body right do-GEN for
'Eat fruits or vegetables to feel better.'

b. *Phol na shobji kha-o shorir thik korar jonno?*
fruit NA vegetable eat-2P body right do-GEN for
'Do you eat fruits, or vegetables to feel better? **(only AltQ)**

In the Mandarin counterparts of these sentences (which we do not repeat here for reasons of space), Erlewine reports that the speakers who permit neutralization agree that *haíshi* only contributes a non-interrogative, existential interpretation. Though Erlewine's analysis laid out above in (68) appears to account for the neutralization of the interrogative-boolean divide, his technology for doing the same raises some serious issues.

Recall that in his system, the boolean disjunction is specified for [u∃] and thus ensures mandatory existential closure over its focus alternatives. In the traditional conception of existential closure, for example from Rooth and Partee (1982), Kratzer and Shimoyama (2002), the ∃ operator accesses the focus alternatives set of its sister and returns an ordinary singleton set. The traditional definition is repeated below:

(73) $[\![\exists\alpha]\!] = \{\lambda w.\ \exists p \in [\![\alpha]\!]:\ p(w) = 1\}$

However, in Erlewine's system, the ∃ operator can still "pass up" the focus alternatives, even after converting them to an ordinary value. This means that the boolean disjunction *huòzhe* in Mandarin would always retain its focus alternatives. In that case, another Hamblin operator, for example - Q, that merges above the ∃ should be able to access *huòzhe*'s focus set. This Q operator would then use those focus alternatives to return a question meaning - crucially, an AltQ meaning. This analysis then makes two non-trivial predictions: (i) that *huòzhe* should never be able to appear in a PolQ; (ii) whenever *huòzhe* appears in a question, the result should be an AltQ. None of these prediction are borne out, as the following question shows:[11]

(74) *Zhang San xihuan Wang Wu huozhe Li Si ma?*
Zhang San likes Wang Wu HUOZHE Li Si Q
'Does Zhang San like WW or LS? (PolQ)
'Does Zhang San like [WW] or [LS] (AltQ)

We see here that the only interpretation available here is the the polar one, and not the alternative one, contrary to what Erlewine predicts.[12]Unambiguously then, both predictions stand incorrect.

A possible solution Erlewine's analysis might proffer at this juncture is that since ∃ has both converted its sister's focus value and also passed up the focus value, the higher Q operator can access both the ordinary and focus values, resulting in both a PolQ and an AltQ reading. This is reminiscent of the inherent ambiguity in similar configurations in English. However, this solution for Mandarin would not hold water, as we can see. (74) only has a PolQ reading (i.e. it can only be answered with a *yes* or *no*) and no AltQ reading (i.e. it cannot be answered with one of the disjuncts or *neither* or *both*).

In light of these concerns with Erlewine's proposal, one would have to reconsider the ability of ∃ to "pass up" as well as convert its sister's focus value into ordinary value. The potential existence of such operators raises significant questions about the overall structure of the grammar, both because of the omnipotence of the operator as well as its uniqueness - why is ∃ the only operator that can perform this dual function? Reconsidering this property of ∃ also has implications for the explanation of the neutralization of *haíshi* and *huòzhe* - the possibility of neutralization in Erlewine's system crucially hinges on the exceptionality of of ∃.

In spite of these concerns, it is the case that any study of the boolean-interrogative divide within the disjunction space in other languages that locates the root of the distinction in the grammar would have to contend with the neutralization prediction. In the next section, we lay out a proposal to account for the lack of neutralization in Bangla as seen in (69)-(72), which is compatible with our syntactic proposals in the earlier part of this paper.

[11]We thank Yi-Hsun Chen, Shu-Hao Shih and Jess Law for the judgements.
[12]Note that the judgements remain the same even without the overt presence of the Q particle *ma*.

4 Compositional proposals

4.1 Revised CC

We propose an account of the Bangla paradigm within the framework of Alternative Semantics, adopting Erlewine's basic idea that the two types of disjunction must share a common core: the ability to generate alternatives (in the spirit of Partee and Rooth 1983, Aloni 2003, Simons 2005b, Alonso-Ovalle 2006; see Ramchand 1997 for the very first extension of Hamblin semantics to quantification in the domain of *k*-words (wh-words) in Bangla). More concretely, these alternatives are focus alternatives, thereby defending the claim that both the boolean disjunction *ba* and the interrogative disjunction *kina* necessarily project a focus-semantic alternative set of their disjuncts. This is illustrated below:

(75) a. *Sita Ram ba Laxman-ke bhalobaash-e.*
Sita Ram or Laxman-ACC love-3P.HAB
'Sita loves Ram or Laxman.'

b. $[\![\text{Sita Ram ba Laxman-ke bhalobaashe}]\!]^f = \{\lambda w.\text{love}_w(S,R),\ \lambda w.\text{love}_w(S,L)\}$

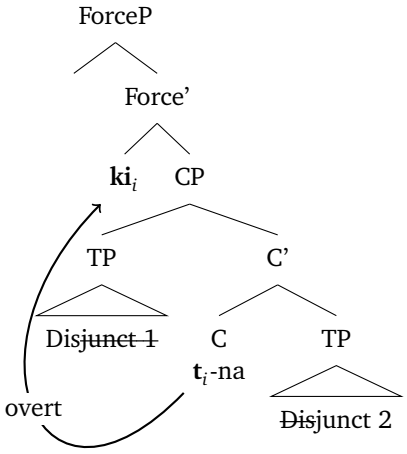
(76) a. *Sita ki$_i$ Ram t$_i$-na Laxman-ke bhalobaashe?*
Sita ki Ram t-NAA Laxman-ACC love-3P.HAB
'Which of the two does Sita love: Ram or Laxman?'

b. $[\![\text{Sita (ki) Ram na Laxman-ke bhalobaashe}]\!]^f = \{\lambda w.\text{love}_w(S,R),\ \lambda w.\text{love}_w(S,L)\}$

In its similarity with Erlewine's proposal for Mandarin *ba*/*huòzhe* and *kina*/*haíshi*, this explanation provides cross-linguistic support for the claim that refinements within the disjunction space still retain the core identity of disjunction.

The vital syntactic proposal about an AltQ in Bangla made earlier is repeated below:

(77) Matrix interrogative disjunction



In describing this structure, we had said that it is in order to mark the scope of disjunction that *ki* moves out of *kina* to a higher position (in the spirit ofăLarson 1985b and Han and Romero 2004b, but with head-movement and not operator/phrasal movement), leaving *na* behind as the surface instantiation of the connective. This formulation formed the basis of our CC: interrogative disjunction 'whether' (*kina*) is itself actually the concatenation of the surface disjunction connective (*na*) and its scope marker (*ki*) (the Q-Disj complex).

In this section, we will still defend the CC but with a slightly more evolved definition, in light of the discussion above:

(78) **CONCATENATION CLAIM** (final)
Bangla is a language where a Hamblin alternatives *introducing* element and a Hamblin alternatives *manipulating* element are lexically generated as one element - *kina*.

This claim is especially significant in the face of one of the key components of a Hamblin semantics for disjunction (Alonso-Ovalle 2004, 2006, Rawlins 2008, Biezma and Rawlins 2012) which is the disassociation of alternatives-introducing connectives and Hamblin operators. Note that the claim in (78) is not in opposition to this key component: the two genres of elements are crucially still disassociated in their semantic form and function, but only appear in one lexical package which is then dismantled within the derivation. This packaging being available as an option in natural languages is what is striking about the set of facts being explored here.[13]

To begin laying out the proposal, let us start by investigating what the CC means for the disjunction space in Bangla as well as AltQs in the language.

4.2 Accounting for the boolean-interrogative divide

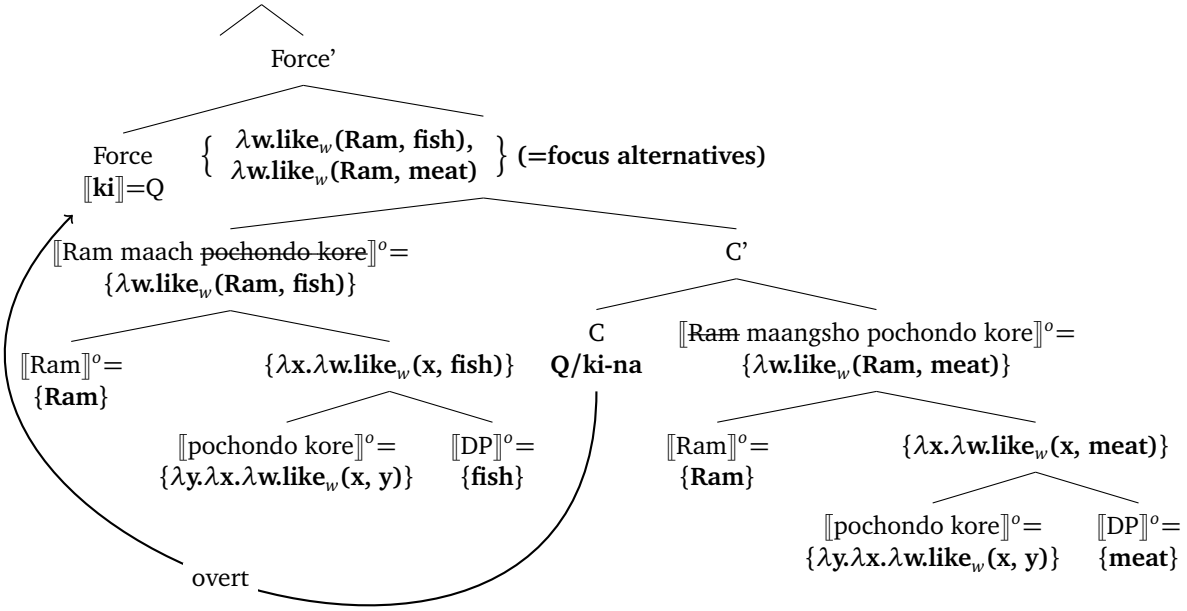
As discussed earlier, Erlewine (2017) locates the locus of the divide in Mandarin in the featural specification of the two disjunctions: the logical disjunction *huòzhe* always has an ∃ adjoined in the structure because of an uninterpretable [u∃] it comes with; while the interrogative disjunction *haíshi* has no such lexical requirement. As a consequence, *huòzhe*'s focus alternatives set mandatorily, in every structure, gets lifted by the ∃ to its ordinary value, resulting in a logical disjunction meaning. Its counterpart, *haíshi*, in Erlewine's sytem, is disallowed from having ∃ adjoin because of the lack of the relevant feature on the head.

We will argue that such a featural setup need not be stipulated for Bangla. Instead, we should view Bangla as an instantiation of a choice Universal Grammar provides to lexically associate elements that are deeply connected: Q-particles and disjunction. In this vein, we argue that the morphological underpinnings of the CC (78) points us to a very definitive

[13] In Alternative Semantics, 'scope' is analogous to sets containing alternatives expanding via PFA up the tree, as described in Section 3.1. A pertinent question that can be asked at this point is: then why does *ki* move at all? We contend that while it might be movement for clause-typing reasons (cf. Cheng 1991), to overtly mark the clause as an interrogative, regardless, the landing site of *ki* has a vital consequence: the presence of the Q operator delimits the expansion of alternatives up the tree.

direction: **interrogative disjunction is the result of the actual presence of the Q operator**. The alternatives introduced by the disjunctor - KINA or Q-*na* - at the base of the tree are then manipulated by this operator itself from a higher position. This results in an AltQ reading with Q/*ki*...*na*. Thus, in this analysis, the focal point is not prescribing features on a head that forces certain operators to adjoin, but the actual presence of the operator within the disjunction connective.

(79) ⟦Ram ki maach na maangsho pochondo kore?⟧^{o}=
{λ**w. R likes fish in w or R likes meat in w**}

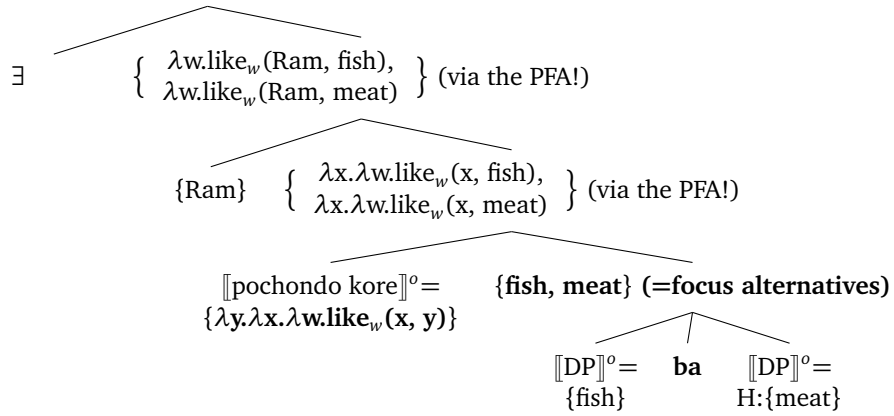


In this tree, we see that each of the disjuncts have an ordinary semantic value, corresponding to their propositional content. The disjunctor collects these alternatives into a set of focus alternatives. The Q particle *ki* has already moved to Force° in the syntax, and is now ready to convert this focus alternative set into an ordinary disjunctive value. Thus, we get an AltQ interpretation at the top, with each alternative corresponding to a possible answer. This is the analysis of interrogative disjunction with the *ki-na* complex in Bangla.

This explanation can also straightforwardly predict why the *ki*...*na* disjunction can never appear in declaratives. The obligatory presence of the Q operator produces a non-singleton set of alternatives as the resultant meaning - which cannot be the right type of output for a declarative.

Like any other Hamblin disjunctors, the logical disjunction connective *ba* also projects a set of focus alternatives. Infact, *kina* and *ba* share the property of being able to project a set of focus alternatives corresponding to their disjuncts. We get the boolean disjunction declarative when the ∃ operator existentially closes over the focus set and outputs the classical meaning for disjunction.

(80) $[\![\exists$ **[Ram likes fish ba meat]** $]\!]^o =$
$\{\lambda w'.\ \exists p \in \{\lambda w.like_w(Ram, fish), \lambda w.like_w(Ram, meat)\} : p(w') = 1\}$



Thus, our analysis locates the crucial difference between logical and interrogative disjunction in the obligatory morphologically-associated presence of the Q operator in the latter case, as opposed to the former. What this translates to in terms of the semantics is that the interrogative disjunction construction never has its focus semantic value 'left over' to be manipulated by any other operator after the Q is done with it. This proposal reflects the fact that interrogative disjunction always leads to an AltQ in Bangla (and can never have a PolQ interpretation) and can never appear in declaratives because the Q comes packaged with the disjunction.

This proposal also straightforwardly predicts the lack of neutralization in (69)-(72). Since these neutralization contexts are concerned with the focus alternatives sets of the disjunctor, and *na* (i.e. what is underlyingly *kina*) does not have any focus alternative set left (because the Q (i.e. *ki*) has already converted the focus set into an ordinary meaning), the interrogative disjunctor is predictably either disallowed, or retains its AltQ interpretation in these contexts.

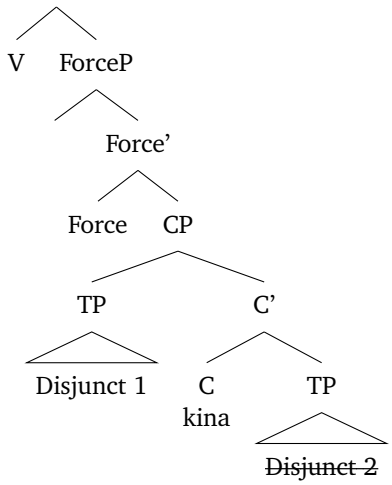
Thus, looking at two very diverse languages - Mandarin and Bangla - both of which have the boolean-interrogative divide, we have made some remarks about where the possible cross-linguistic variation stems from. The analysis here placed the focus on interrogative disjunction, in claiming that the difference comes from the presence of the Q operator head base-generated inside the disjunctor and then moving to a higher position. This movement was independently motivated for Bangla via the discussion of the locality constraints on head-movement. This exact same configuration might not be defensible in other languages with the interrogative-boolean divide. However, the issue can be narrowed down to the presence or absence of neutralization. The absence of neutralization in a language would signal the impossibility of interrogative disjunction ever having a non-interrogative use in that language, which is captured by the analysis presented here. We can arguably defend the claim that Bangla instantiates an option UG provides of the disjunction coming packaged with a Q operator. We can expect to see many other instantiations of the same option - we leave such a cross-linguistic survey for further research.

4.3 Deriving *'whether'*: clause-final *kina*

The objective is to demonstrate that underlyingly, in both clause-embedding with *whether* as well as AltQs, what is present in each case is the Q + Disj complex head *kina*, which denotes a set of focus alternatives. In this section, we take up the case of the non-moved *kina* complex and offer a proposal to capture its semantic contribution as the clausal alternative-encoding expression *whether*.

The syntactic proposal for a 'whether' (clause-final *kina*) construction is repeated below:

(81) Clause-final *kina* (*whether*)

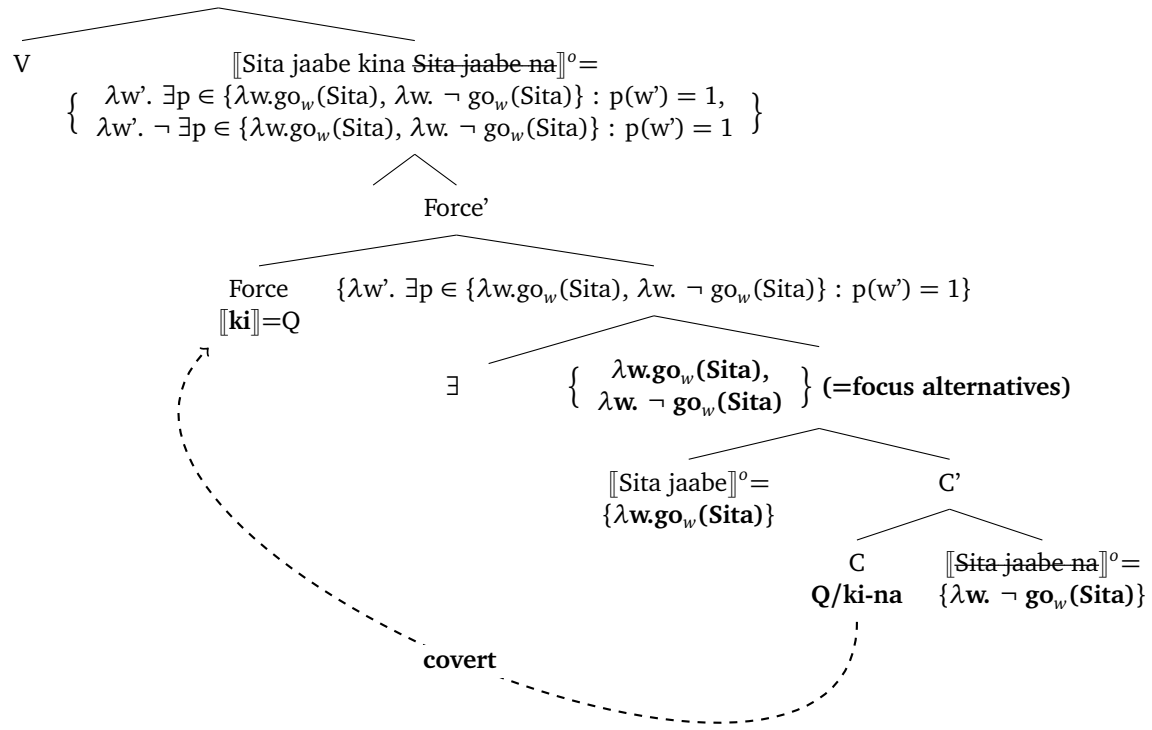


For a sentence such as *Ram knows whether Sita will go*, the second disjunct is completely elided under identity with the first disjunct. The leftover negation feature/marker is deleted under identity with the *na* part of *kina*.

(82) *Ram jaane [Sita jaa-be]* ***kina*** *[~~Sita jaabe~~ ~~na~~]*
Ram knows Sita go-FUT.3P KINA Sita go-FUT.3P
'Ram knows whether Sita will go.'

In terms of the semantics, we maintain our formulation of *kina* as a disjunctive complementizer that introduces alternatives. We propose that the derivation proceeds in the following manner:

(83)



The disjunctive complementizer *kina* introduces a set of focus alternatives comprising its clausal disjuncts: p and $\neg p$. An existential closure operator $\exists$ turns this focus meaning into an ordinary existential statement. The Q operator, which can manipulate ordinary values in addition to focus values (Beck 2006a, Beck and Kim 2006, among many others), takes this existential statement and creates a binary set,[14] resulting in an embedded PolQ reading.

Two crucial details warrant our attention here: (i) as mentioned in Section 2.4, we are assuming head-movement of Q here too, but a covert counterpart of it (unlike the overt movement in the interrogative disjunction configuration); (ii) the $\exists$ operator can access the alternative set before the Q operator (resulting in a PolQ meaning), unlike the structure in (79), where the Q immediately converted the focus set into an AltQ.

These two operations are related. We assume that the overt syntactic movement of *ki* from C to Force in (79) happens as soon as the Force head is merged into the structure. The syntactic string received by the interpretative module thus has Q already in a position to access the alternative set. In contrast, the covert movement in (83) does not have any trigger until after $\exists$ has merged, when the Q operator is needed for interpretation. This results in an embedded PolQ. In contrast, an embedded AltQ interpretation with *kina* and two dissimilar disjuncts would be identical to the root configuration: *ki* would move to the Force head in the subordinate clause overtly in the syntax, again as soon as the head is merged, leaving no opportunity for other operators such as $\exists$ to access the set of alternatives. Thus, we can

[14]For a singleton set approach to polar questions, which we do not adopt here, see Gawron (2001), Biezma and Rawlins (2012), among others.

maintain a consistent account of what generates the alternatives and what Hamblin operators access and manipulate those alternatives across all of these constructions, building a strong case for their underlying connectedness.

Upholding the tenet of preclusion of movement for scopal reasons in Alternative Semantics, Beck and Kim (2006) presents arguments in favor of reanalyzing Larson's island-sensitivity paradigms as focus intervention effects. They argue that it is problematic to assume that there is overt movement of any part of the disjunctive phrase in AltQs. Their analysis, arguing for a Hamblin/Rooth approach to disjunction, propose that focus-sensitive operators such as 'only'ĂŹ quantify over the alternatives introduced by the disjunction and consequently 'reset' them, making the disjunctive focus alternatives unavailable to higher operators such as Q. This is also what happens in the cases which Larson (1985a) argued to be islands, the claim being that the ungrammaticality arises not from the prohibition of movement of a null operator/*whether* across island-boundaries but the intervention of operators between Q and the disjunction phrase.

In Bangla, the theoretical possibility of focus intervention effects occurring in AltQs can still be maintained under our analysis because, as argued above, there is no movement for assigning scope to the disjunction. Alternatives are introduced and computed in-situ and thus another focus-sensitive operator's presence risks disrupting interpretation of an AltQ. Thus, Bangla again stands out in the cross-linguistic territory marked out so far in that a part of the Disjunction Phrase (in Beck and Kim 2006's categorial terms) does move, and yet does not rule out the possibility of focus intervention effects.

However, we demonstrate in the next section that focus intervention effects do not arise in Bangla AltQs. They do arise as expected in Bangla *wh*-questions, however. Beck and Kim (2006) strongly defend their claim that in any given language, the set of interveners should be the same in both types (*wh* and AltQs) of questions. Given that hypothesis, it is a puzzle as to why the set of interveners that produce intervention effects in *wh*-questions do not do so AltQs in Bangla. We will propose a solution to this puzzle: the answer lies in the size of the disjuncts. Given our proposal about the syntactic size of *kina*'s disjuncts, a ready answer will be shown to be available for the lack of intervention effects in AltQs.

We first very briefly introduce the phenomenon of focus intervention in AltQs. Following that, we lay out the empirical domain of *wh*-intervention effects in Bangla and the lack of the same in AltQs. We then show how the surprising disparity can be accounted for under the proposals proffered in this paper.

5 (Lack of) Focus Intervention in AltQs

A focus-centered analysis of elements such as indeterminate pronouns or disjunction does automatically carry an important prediction:

(84) The presence of a focus-sensitive operator in-between the interpreting operator and the base focus-alternatives-generating element can disrupt the relationship, leading to a crash in the interpretation component.

This particular phenomenon was first termed an *intervention effect* in Beck (2006a). She schematized the relevant configuration in the following manner:

(85) *[Q . . . [OP [. . . *wh*-phrase . . .]] . . .]]

The OP is an 'intervener' that disrupts the association between the Q operator and the in-*situ* interrogative phrase. Intervention comes into play in the computation of Hamblin/Rooth alternatives, and does not affect any movement or binding. Focus intervention effects in *wh*-questions is an attested cross-linguistic phenomenon that has received a host of attention in the literature.

Beck and Kim (2006) was the first study to point out that focus intervention effects can also be seen in AltQs. To begin with, the authors point out, following Bartels (1999) and Han and Romero (2004a), that the only way to get an AltQ reading instead of a PolQ reading for the following question is to pronounce both disjuncts with focus intonation.

(86) a. Did Sally teach syntax or semantics? ✓PolQ, *AltQ

b. Did Sally teach [SYNTAX]$_F$ or [SEMANTICS]$_F$? ✓AltQ, *PolQ

The authors list a couple of constructions where only the AltQ reading is lost from such questions, while the PolQ remains unaffected. Han (1999), Han and Romero (2001) demonstrate this with negation, Beck and Kim (2006) with operators such as *only, also, almost, nobody, very few, often*, etc in a variety of languages. Representative examples are provided below:

(87) Did**n't** Sally teach syntax or semantics?

a. Yes. ✓PolQ

b. # Semantics *AltQ

(88) Does **only** John like Mary or Susan? *AltQ

In each case, operators with general properties of interveners (focus association (Beck 2006a), non-additivity (Mayr 2014)) interferes between the in-*situ* disjunction phrase and the Q operator.

(89) *[Q . . . [OP [. . . [A or B] . . .]] . . .]]

In their conceptualization of intervention effects, Beck and Kim (2006) assign crucial importance to the syntactic configuration of the construction, in that the interference of an operator is defined in terms of structural c-command. This set up predicts that as soon as the *wh* or disjunction phrase is structurally placed higher than the intervener, the intervener is no longer an intervener. Compare Beck and Kim (2006)'s minimal pair from German demonstrating this prediction.

(90) Beck and Kim (2006): (12a, 12c)

a. ?* *Hat* ***nur*** *Maria [den Jonas oder die Ida] eingeladen?*
has only Maria the Jonas or the Ida invited
Intended: 'Did only Maria invite Jonas or Ida?'

b. *Hat [den Jonas oder die Ida]* ***nur*** *Maria eingeladen?*
has the Jonas or the Ida only Maria invited?
'Did only Maria invite Jonas or Ida?'

The syntactic nature of the intervention effect is also reflected in the following constraint that the authors posit:

(91) *General Minimality Effect MIN*
An alternatives-introducing XP such as the [DisjP] cannot have the ∼ operator as its closest c-commanding operator:

a. * [Q [. . . [∼C [$_{\phi}$ . . . [$_{DisjP}$ A or B] . . .]] . . .]]

The syncategorematic formulation of the constraint states that the evaluation of alternatives by an XP cannot skip an intervening an ∼ operator. This operator is Rooth's ∼ operator (usually accompanied by the contextual free variable C), which resets the focus semantic value of the whole structure to a singleton set containing the ordinary semantic value, as per its definition:

(92) Rooth (1992)

a. $[\![\sim C\ \phi]\!]^o = [\![\phi]\!]^o$ if $[\![C]\!]^o \subseteq [\![\phi]\!]^f$, undefined otherwise

b. $[\![\sim C\ \phi]\!]^f = \{ [\![\sim C\ \phi]\!]^o \}$

Thus, on such an account, the intervention follows from the Q operator having no alternatives left to evaluate, because the ∼ operator gets to the focus alternatives first, and converts them into an ordinary singleton set (a 'non-question meaning', in Beck & Kim's terms).

5.1 Intervention effects in Bangla

In this section, we first demonstrate that *wh*-questions in Bangla do display Beck-style intervention effects. We demarcate the space of possible interveners in Bangla, which we then test across other types of questions to assess their robustness.

5.1.1 Wh-intervention effects in Bangla

Bangla is a *wh*-in-situ language.[15] Given a Rooth-Hamblin analysis of *wh*-words (see Ramchand 1997 for an analysis of Bangla *k/wh*-words in this framework), an in-situ *wh*-phrase in Bangla

[15] See Simpson and Bhattacharya (2003) for a contrary view.

may not be c-commanded by an intervener. Elements like *only, even, almost everyone, very few, nobody*[16] are interveners in Bangla *wh*-questions, while elements such as *always, every/all, often* are not. Some of the latter elements trigger intervention effects in English and German (Beck 1996, Pesetsky 2000). These differences are in keeping with an observation going back to Beck (1996) that the set of problematic interveners is subject to considerable cross-linguistic variation.

We provide a few representative examples demonstrating the intervention effect, in the (a) examples; the (b) examples show scrambling the *wh*-phrase to a position higher than the intervener obliterates the intervention effect

(93) a. **Shudhu Maria-i kaake nemontonno kore-che?*
only Maria-EMPH whom invite do-3P.PRES
Intended: 'Who did only Maria invite?'

b. *Kaake shudhu Maria-i nemontonno koreche?*
whom only Maria-EMPH invite do-3P.PRES
'Who did only Maria invite?'

(94) a. **Praay shobai kaake nemontonno kore-chilo?*
almost everyone whom invite do-3P.PAST
Intended: 'Who did almost everyone invite?'

b. *Kaake praay shobai nemontonno korechilo?*
whom almost everyone invite do-3P.PAST
'Who did almost everyone invite?'

(95) a. ??/**Kalke tomar bari-te keu kon aitem-ta khay-ni?*
yesterday your house-LOC someone which item-CL eat-NEG
Intended: 'Yesterday at your place, which item did no one eat?'

b. *Kalke tomar barite kon aitem-ta keu khayni?*
yesterday your house-LOC which item-CL someone eat-NEG
'Yesterday at your place, which item did no one eat?'

5.1.2 Do Bangla AltQs have intervention effects?

Beck and Kim (2006) demonstrate with concrete empirical evidence that it appears to be a cross-linguistic pattern that the problematic elements triggering intervention effects in *wh*-questions also trigger the same effects in AltQs. In the former case, these interveners disrupt the relationship between the *wh*-phrase and Q; while in the latter, they disrupt the relationship between the disjunction phrase and Q. However, in Bangla, the quantificational

[16]N-words in Bangla are complicated because the negation either appears post-verbally as a suffix, or immediately pre-verbally, depending upon considerations of tense and aspect. N-words are formed via *some* + this suffixal negation. See Bhadra et al. (2016) for an exhaustive survey of NPIs and n-words in Bangla.

elements that were shown to be interveners in *wh*-questions in the previous section do not trigger intervention effects in AltQs.

(96) a. *Praay shobai Ram-ke na Sita-ke nemontonno kore-chilo?*
almost everyone Ram-ACC NA Sita-ACC invite do-3P.PAST
'Did almost everyone invite Ram, or Sita?'

b. *Ram-ke na Sita-ke praay shobai nemontonno kore-chilo?*
Ram-ACC NA Sita-ACC almost everyone invite do-3P.PAST
'Did almost everyone invite Ram, or Sita?'

(97) a. *Kalke tomar bari-te keu Ram-er sathe na Sita-r sathe kotha bole-ni?*
yesterday your house-LOC someone Ram-GEN with NA Sita-GEN with talk say-NEG
'At your house yesterday, did no one talk to Ram, or Sita?'

b. *Kalke tomar bari-te Ram-er sathe na Sita-r sathe keu kotha bole-ni?*
yesterday your house-LOC Ram-GEN with NA Sita-GEN with someone talk say-NEG
'At your house yesterday, did no one talk to Ram, or Sita?'

Thus, interrogative disjunction *kina* in Bangla AltQs do not appear to be affected by the presence of focus interveners. Adopting a Rooth-Hamblin analysis of disjunction, as we have, then appears to make the wrong prediction: disjunctive alternatives, if they are indeed focus alternatives, should be sensitive to the presence of focus-sensitive operators other than Q, but are not. Then, we either have to give up a Rooth-Hamblin analysis of disjunction or stipulate an approach which claims that focus alternatives in AltQs (but not in *wh*-Qs) are at a different dimension which is invisible to interveners but somehow visible to operators like Q and ∃.

In the next section, we show that we do not need to walk down any of these paths. We can retain a Roothian-Hamblinized system of disjunction, as well as a traditional conception of focus intervention. The reason for the disparity between Bangla *wh*-questions and AltQs arise from the size of the disjuncts in the latter, an issue that is not present for the former.

5.2 Size matters

One of the main claims in earlier sections was that *kina* is a disjunctive complementizer that takes TPs as complements (analogous in a few respects to Han and Romero 2004b's analysis of Hindi AltQs). Sub-clausal surface structures were shown to be derived via ellipsis and backward gapping in some cases. Similar 'big disjunct' approaches have been adopted for other languages as well: Gračanin-Yuksek (2016) argues that Turkish AltQs involve full CP disjuncts; Uegaki (2014) argues that Japanese AltQs involve disjunctions of whole PolQs; Pruitt and Roelofsen (2013, 2011) propose that English AltQs involve disjunctions of full CPs.

However, in the literature on the semantics of AltQs, especially within the Alternative Semantics framework, both movement and ellipsis within the disjuncts are considered to be at odds with the fundamental tenets of the theory. Especially, as Beck and Kim (2006) (p.204) put it, the presence of intervention effects "puts a roof on the size of the disjuncts, in that an analysis must be excluded in which the intervener is part of the disjuncts and has been elided, such as":

(98) [Q [$_{DisjP}$ [only$_C$ [∼C [$_{IP}$ Mary [intro. Sue to Bill]]]] or [~~only$_C$ [∼C [$_{IP}$ Mary [intro. Sue~~ [to Tom]]]]]]

(Beck and Kim 2006: 148)

If such a structure were indeed possible, the authors argue, then the AltQ below should not have been ungrammatical, because there would have been no intervention effect:

(99) ?? Did only Mary introduce Sue to Bill or (to) Tom?

The authors (as well as Erlewine 2017 for Mandarin AltQs) further go on to show that in languages with consistent intervention effects in both *wh*-questions and AltQs such as English and German, in constructions where the intervener is present in both disjuncts and is not elided, there is no intervention effect:

(100) a. *Hat [nur die erste Mannschaft gewonnen] oder [nur die zweite]?*
has only the first team won or only the second
'Did only the first team win or only the second?'

b. *Hat [nur der Peter gespielt] oder [auch der Fritz]?*
has only the Peter played or also the Fritz
'Did only Peter play, or Fritz too?

c. Did nobody sing or nobody dance?

This set of facts, Beck and Kim argue, puts a potential Han and Romero-style analysis (big disjunct + repetition of the intervener in each disjunct + ellipsis of that intervener and other material) in jeopardy. This is especially in light of a constraint Han and Romero (2004a)'s propose:[17]

(101) Focus Deletion Constraint (FDC)
Focus-marked constituents at LF (or their phonological locus) cannot delete at Spell-Out.

The FDC allows Han and Romero to account for the grammaticality contrast between (a) and (c) below; (b) and (d) are the LF structures of the two sentences, respectively:

[17]The authors adopt this idea from previous literature: Heim (1997) applied this constraint to antecedent-contained ellipsis; Merchant (2001) used it for sluicing; and Romero (2000) for reduced conditionals.

(102) a. ?? Either he REALly IS going out with MarTIna or with SUE.

b. *either [[$_{CP_1}$ VERUM$_F$ he REALly IS going out with MarTIna$_{F_1}$]~C]~C$_1$ or [[$_{CP_2}$ ~~VERUM$_F$ he REALly IS going out~~ with SUE$_{F_2}$]~C'$_2$

c. Either he REALly IS going out with MarTIna or he REALly IS going out with SUE.

d. either [[$_{CP_1}$ VERUM$_F$ he REALly IS going out with MarTIna$_{F_1}$]~C]~C$_1$ or [[$_{CP_2}$ VERUM$_F$ he REALly IS going out with SUE$_{F_2}$]~C'$_2$

What makes (a) ungrammatical and (c) grammatical? Notably, both have the exact same LF representations. Han and Romero argue that the answer lies in the material that is pronounced at Spell-Out: the ungrammaticality of (a) is the result of deleting a focus-marked constituent (*REALly*) and its phonological locus (VERUM$_F$), while (c) is grammatical because no focus-marked constituent is deleted or left unpronounced at Spell-Out.

It is in light of this FDC constraint that Beck and Kim argue against the structure in (98). And indeed, if the constraint did not hold we would expect (99) to be a grammatical AltQ with the relevant interpretation, i.e. each disjunct associated with *only*. Thus, we can glean two crucial insights from this discussion:

(103) a. The repetition of an intervener in each disjunct results in the absence of intervention effects.

b. The deletion of one of those interveners and its focused-marked constituent violates the FDC, and should result in ungrammaticality.

Both of these insights are highly relevant for our discussion of the lack of intervention effects in Bangla AltQs. We can maintain the big disjunct claim consistently:

(104) The lack of focus intervention effects in Bangla AltQs is the result of the potential intervener being present in each disjunct.

Taking the attested intervener quantifier *few*, for the Bangla counterpart of the sentence *Did few people invite Ram or did few people invite Sita?*:

(105) [Q/**ki**$_i$ [**Khub alpo kojon** Ram-ke$_F$ nemontonno korechilo] t$_i$-na [**khub alpo kojon** Sita-ke$_F$ nemontonno korechilo]]?

The focus-sensitive operator *khub alpo* ('few') is present in both disjuncts of *kina*. The *ki* has moved out of the disjunctor head in the syntax, and at LF it is the Q operator. We present a derivation below to show how intervention effects do not arise in this configuration.

Beck (2006b) assumes that quantifier as well as focus operators can be accompanied by Rooth's ~ operator (predicting focus-affected interpretations of quantifiers studied in Herburger 1993, Krifka 1990, among others), which resets the focus semantic value of the whole structure to a singleton set containing the ordinary semantic value, as defined in (92) above. Assuming this operator (and the contextual free variable C) to be present

as an accompaniment to the quantifier *khub alpo* ('few') in each of the disjuncts in (105) (without getting into the technicalities of the semantics of the quantifier), we can see how an intervention effect is avoided in the structure :

(106) a. [Q [$_\phi$ few people invited RAM$_F$] t-*na* [$_\phi$ few people invited SITA$_F$]
b. = [Q [$_\phi$ few people invited RAM$_F$]~C$_1$ t-*na* [$_\phi$ few people invited SITA$_F$]~C$_2$

(107) a. $[\![\text{Ram}_F]\!]^o$ = Ram
b. $[\![\text{Ram}_F]\!]^f$ = {Ram, Shyam, Jodu, ...}

(108) a. $[\![\text{few people invited Ram}_F]\!]^o = \lambda$w. invite$_w$(few-people, Ram)
b. $[\![\text{few people invited Ram}_F]\!]^f = \left\{ \begin{array}{l} \lambda\text{w. invite\_w(few-people, Ram),} \\ \lambda\text{w. invite\_w(few-people, Shyam),} \\ \lambda\text{w. invite\_w(few-people, Jodu)} \end{array} \right\}$

After the generation of these focus alternatives, the ~ applies to this set and resets the focus value to an ordinary value:

(109) [$[\![\text{few people invited Ram}_F]\!]^f$]~C = λw. for all x such that few-people invited x invited x in w : x = Ram

The exact same computation takes place in the second disjunct too, with [Sita]$_F$. After that, the disjunctor *kina* takes these two disjuncts (within each of which the focus-sensitive operator has already associated with the F-marked material) and forms a set:

(110) [Disjunct 1] ***kina*** [Disjunct 2] = { λw. for all x such that few-people invited x invited x in w : x = Ram, λw. for all x such that few-people invited x invited x in w : x = Sita }

This leaves us with no configuration in which the focus-sensitive operator is intervening in the relationship between the disjunctor and Q (aka *ki* after it moves out). Thus, this system, assuming a structure with clausal (TP) disjuncts where the intervener gets repeated in each disjunct explains the lack of focus intervention effects in Bangla AltQs.

6 Conclusion

We have proposed that the clausal-disjunction-embedding element *whether* and the AltQ-forming interrogative disjunction element have an identical underlying representation in Bangla. This element is a disjunctive complementizer element that disjoins clausal constituents in the syntax that translate into focus alternatives in the semantics. This investigation lies at the syntax-semantics interface, and argues that multifarious evidence from both the domains support the main claim, including non-neutralization of the boolean-interrogative divide, and

both the lack of focus intervention effects and disjunctive subjects in AltQs. The analysis offered supports the conception of Bangla as an instantiation of a choice Universal Grammar provides to lexically associate elements that are deeply connected: Q-particles and disjunction. The range of empirical facts explored receive a principled explanation under the approach of viewing the language as allowing Hamblin-alternatives manipulating elements to be lexically associated with Hamblin-alternatives generating elements.

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