Bengali negation is allomorphic: Consequences for ellipsis and morphology*

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Apr 1, 2020

Abstract

This paper investigates the distribution of the non-copular negative markers in Bengali: *na* and *ni*. The default negation, *na*, appears with most verb forms, however, with perfect verbs, *ni* is used instead. Despite this general rule, irrealis clauses and elliptical constructions require *na* even with a perfect verb. This paper argues that distribution of negative morphemes in Bengali, including the exceptional irrealis and elliptical constructions, is best analysed as allomorphic. This instantiates a case of long-distance affixal allomorphy conditioned by inward sensitivity to morphosyntactic features, that is bled by ellipsis. Thus, the analysis has ramifications for the study of locality and directionality restrictions on contextual allomorphy as well as the mechanism and derivational timing of ellipsis.

1 Introduction

Bengali (Eastern Indo-Aryan, also called Bangla) shows a variety of different negation strategies. This paper investigates the distribution of the non-copular forms *na* and *ni* in Western dialects. The former, *na*, is the elsewhere form of clausal negation, while the latter, *ni* has a restricted distribution, appearing only in perfect constructions. While their distribution is nearly complementary, two constructions involve the unexpected appearance of the elsewhere negation with a perfect verb: certain irrealis clauses and elliptical constructions. On the basis of these constructions with the "wrong" negation, this paper argues that the distribution of *na* and *ni* is best understood as allomorphic, not semantic, contra Ramchand's 2004 analysis. As this paper analyses allomorphy as interacting with clausal structure and ellipsis, the proposal has ramifications for two

*Thanks to Adam Albright, Jonathan Bobaljik, Bronwyn Bjorkman, Christos Christopoulos, Sabine Iatridou, Filipe Kobayashi, and Stanislao Zompí for discussion and comments, Dmitry Privoznov for inspiration, David Pesetsky for suggestions, Debal Banerjee, Sagarika Banerjee, and Shoma Bhattacharya for judgements, and to the audience at CLA 2019 and LSA 2020 for comments. This research was supported by the Social Sciences and Humanities Research Council of Canada Doctoral Fellowship 752-2017-0069.

areas of current investigation in linguistic theory: locality and directionality of contextual allomorphy (Bobaljik, 2000; Carstairs-McCarthy, 2001; Moskal, 2015, a.o.) and the derivational timing of ellipsis (Aelbrecht, 2010; Sailor, forthcoming, a.o.). In particular, it provides evidence in favour of inward-sensitive morphosyntactically-conditioned allomorphy and long distance contextual allomorphy between affixes, as well as an argument for PF-deletion being early in the post-syntax.

The paper is structured as follows. Section 2 presents how negative perfects are normally formed in Bengali, as well as how irrealis clauses and ellipsis are exceptions to the normal negative perfect construction. Section 3 establishes the basic analysis of the facts at hand, including that the negation and the perfect behave uniformly for syntactic and semantic diagnostics in the ellipsis and irrealis clauses, as well as establishing the presence of structure inside the ellipsis site. Section 4 presents the morphological proposal to account for the distribution of negative forms and argues against a semantic account of the facts. Section 5 discusses the implications of the proposal for the nature of the restrictions on contextual allomorphy in a Distributed Morphology (Halle and Marantz, 1993, 1994) framework, and the derivational timing of ellipsis. Section 6 concludes.

2 Data

All examples reflect the judgements of the native-speaker author and of three adult native speaker consultants of Western Bengali dialects from Jharkhand and Bihar, educated in Calcutta, and living in the North American diaspora. Acceptability judgements were elicited by having the native-speaker author produce the target sentences (with context when shown) and asking the consultants if the utterance was acceptable. Consultants were then asked to repeat the target utterances to ensure they had not misheard them or made changes to the target when providing their judgements.

Bengali is an SOV language with relatively flexible word order. Verbs inflect for tense and aspect, and agree with subjects for person and three levels of honourificity: (I)ntimate, (N)eutral, and (H)onourific.

Constructing negative clauses in Bengali normally involves appending a clause-final negation to the affirmative clause, with the exception of non-finite and certain irrealis clauses that will be discussed shortly. Clause-final negation applies across all aspects and tenses, as shown in (1).[1]

(1) a. dolil-er opor soi kor-chi-l-am (na)
deed-GEN top signature do-PROG-PST-1.PST (NEG)
'I was (not) signing the deed.'

[1]Glosses use the following conventions: Underdots represent retroflexion, grave accents mark near-open vowels, ⟨s⟩ is used to transcribe the alveolopalatal fricative, ⟨c⟩ and ⟨j⟩ are post-alveolar affricates, geminate consonants are doubled, and h after a consonant represents aspiration or breathy voice. All other symbols have their IPA values.

b. to-ra (to) pẽãj kha-s (na)
2I-PL.HUM (EMPH) onion eat-2I (NEG)
'You (intimate) all (don't) eat onions.'

c. aj bikel-e ukil-ji as-b-en (na)
today evening-LOC lawyer-HON come-FUT-H (NEG)
'The lawyer will (not) come this evening.'

However, perfect verbs in either the past or the present cannot be negated by just appending clause-final *na*, as shown in 2.

(2) a. notun gaṛi kin-e ch-e (*na)
new car buy-PRF AUX-3N (*NEG)
'They have (*not) bought a new car.'

b. tin-ṭe ciṭhi likh-e chi-l-am (*na)
3-CL letter write-PRF AUX-PST-1.PST (*NEG)
'I had (*not) written 3 letters.'

Future perfects behave differently, requiring a different auxiliary, and are discussed in section 3. Negating a perfect requires omitting the perfect marker *-e* and tense, attaching the agreement marker directly to the verb root, and a special form of negation, *ni*. This is shown in (3).

(3) notun gaṛi kin-i ni
new car buy-1 NI
'I have/had not bought a new car.'

The primary goal of this paper will be to understand the negative perfect construction in (3) and its relation to the affirmative perfect. To do so, however, we will have to investigate two contexts where negating a perfect unexpectedly does not require *ni*, but rather the elsewhere negation *na*. These environments are certain irrealis clauses and elliptical constructions.

Certain irrealis clauses in Bengali use pre-verbal negation rather than clause-final negation (Dasgupta, 1996).[2] These include clauses headed by the complementizer *jèno* 'as if'/'so that' and *jodi* 'if'. When a pre-verbal negation is used with the perfect, it obligatorily surfaces as *na* with an overt perfect and auxiliary as in (4a), rather than the expected *ni* (with or without the overt perfect and auxiliary) as in (4b).

(4) a. bhan kòro jèno o-ke na dekh-te pe-e
pretense do.IMP.N C.IRR 3-OBL NEG look-INF receive-PRF
ch-o!
AUX-2N
'Pretend you haven't seen him/her!'

[2]Non-finite and participial clauses also use pre-verbal negation in Bengali. However, they disallow perfects, and Dasgupta (1996) proposes this is because they are structurally too small.

b. * bhan kòro jèno o-ke ni dekh-te pe-(e)
Pretense do.IMP.N C.IRR 3N-OBL NEG look-INF receive-(PRF)
(ch)-o!
(AUX)-2N

Thus we see that in these irrealis clauses the *ni* construction is unavailable, and the elsewhere negation arises instead.

The relevant ellipsis examples involve the absence of a verb under identity with a perfect antecedent, with some number of remnants and negation surviving in the second clause. Example (5) shows that despite having a perfect verb in the antecedent, the negation outside the ellipsis site (denoted Δ) is the default *na*, not the perfect *ni*.

(5) ilis ònek bar khe-e ch-i, (kintu) magur ek bar-o Δ
hilsa many times eat-PRF AUX-1, (but) catfish one time-even Δ
na/*ni
NEG/*NI
'I have eaten hilsa many times, but catfish not even once'

In order to understand the distribution of *ni* and *na*, the syntax and semantics of three core data points need to be understood. Firstly, the negative construction in (3) does not look morphologically similar to the corresponding affirmative in (2a), both of which are claimed to be perfects. So before proceeding to analyse them as perfects, we must convince ourselves that they are. Secondly, if the behaviour of pre-verbal negation is to bear on the question of negating perfects, we must determine why the position of negation in the irrealis clauses is different than in matrix declaratives, and whether it is syntactically and semantically behaving uniformly across non-perfect negatives like (1), *ni* constructions as in (3), and irrealis negatives as in (4a). Finally, in order for the ellipsis constructions like (5) to bear on the issue of negating perfects, we must convince ourselves both that the observed negation is clausal negation and not constituent negation of the NPI adverb 'even once', and that there is indeed a perfect inside the ellipsis site (i.e. both that the ellipsis site contains structure and that deletion requires strict parallelism at least for perfects). The next section addresses these questions.

3 Analysis

This section provides analyses of the data presented in section 2, in order to demonstrate that the question at hand is one of how to negate perfects as opposed to some other construction, and also that the data from irrealis negatives and ellipsis truly does bear on the issue.

Section 3.1 discusses the properties of perfects and how to distinguish them from past perfectives, which have a similar linguistic function of expressing anteriority. On the bases of the properties discussed, it is argued that both the affirmative V-*e* *ch*-AGR and the V-AGR *ni* constructions are perfects.

Section 3.2 investigates the syntactic and semantic properties of clausal negation in Bengali. It argues that negation behaves uniformly across all three constructions of interest in terms of prosodic closeness with the verb, semantic scope, and phrasal status.

Section 3.3 investigates the properties of elliptical constructions in Bengali, as well as the site of negation. It argues firstly that constituent negation does not exist in Bengali, and hence all negation is clausal. It further demonstrates using syntactic tests that structure exists within the ellipsis site, and using semantic tests that the elided verb is obligatorily interpreted as perfect.

3.1 Finding perfects

Since both the present perfect and the past perfective express some form of anteriority, it is easy to conflate the two. McCoard (1978) first introduces the terminology of 'extended now' to describe the behaviour of the perfect as opposed to the past. While perfects do express anteriority, they also express some relation to the present, hence 'now' is somehow extended to make reference to the past. Iatridou et al. (2001) formalise an 'extended now' theory of the perfect in proposing that perfects introduce a temporal interval, which they call the Perfect Time Span (PTS), and assert that the event in question occurred within the PTS. The right boundary of the PTS is set by tense, and the left boundary by *since*-adverbials. In Reichenbachian (1947) terms, a perfect can be thought of as changing how tense relates the reference time to the speech time. Unlike a simple past, which asserts that the whole of the reference time interval precedes the utterance time, a present perfect asserts that the right boundary of the reference time coincides with speech time.

This understanding of the perfect gives rise to three differences between a perfect and a past perfective. Firstly, the ability to set the left boundary of the PTS using *since*-adverbials is unique to perfects, because, according to Iatridou et al. (2001), PTSs are unique to perfects. Secondly, since present perfects assert that the PTS runs until speech time, some 'current relevance' of the completed event to the current time is required for using a present perfect instead of a past. Iatridou et al. (2001) note that in languages which build perfects out of perfective roots, this is often realised as requiring the resultant state of the completed event hold until the end of the PTS. Finally, since the perfect is itself not a tense, it is compatible with past, present, and future interpretations, whereas pasts are obviously restricted only to the past. Below, we shall see a demonstration of each of these tests in English, before they are applied to Bengali affirmative and negative perfect constructions.

First we observe that present and past perfects both admit *since* adjuncts, but simple pasts do not.

(6) Modification by *since*

a. I have/had eaten duck eggs 3 times since 2012.

b. I have/had not eaten meat since 2012.

c. * I ate/did not eat meat since 2012.

This same behaviour is observed with Bengali affirmative perfects and the *ni* construction, but not simple pasts.

(7) a. 2012 theke (sudhu) 3 bar has-er ḍim khe-e ch-i
2012 since (only) 3 times duck-GEN egg eat-PRF AUX-1
'I have (only) eaten duck egg thrice since 2012.'

b. 2012 theke mangso kha-i ni
2012 since meat eat-1 NI
'I have/had not eaten meat since 2012.'

c. */? 2012 theke mangso khe-l-am na
2012 since meat eat-PST-1.PST NEG
Int:'I did not eat meat since 2012'[3]

Secondly, a present perfects built on perfective roots often imposes the requirement that the result state of the completed event hold up to speech time. This contrasts with simple pasts, which have no such requirements. Consider the resultative interpretation of *lose*, shown to be present in (8) with the perfect, but not the past, in English.[4]

(8) a. I have lost my glasses (# but I found them just now).
b. Yesterday I lost my glasses (but I found them just now).

In (9) and (10) we see that both affirmative perfects and *ni* constructions require the resulting state to hold to the end of the PTS, but neither affirmative, nor negative pasts do.

(9) When did you lose your glasses?

a. kal còsma hari-e ch-i (# ar aj khũj-e
yesterday glasses lose-PRF AUX-1 (# and today search-PRF
pe-l-am)
receive-PST-1.PST)
≈ 'I have lost my glasses yesterday (# and found them today).'

b. kal còsma hara-l-am (ar aj khũj-e
yesterday glasses lose-PST-1.PST (and today search-PRF
pe-l-am)
receive-PST-1.PST)
'Yesterday I lost my glasses (and found them today).'

(10) What happened to the stove?

[3]One consultant accepted this, but only in narrative contexts.

[4]Exact parallelism is not possible in the English examples because of the ban on past temporal positionals with the perfect (known as the Present Perfect Puzzle, see Klein (1992) for a discussion of the puzzle, and Pancheva and von Stechow (2003); Katz (2003) for possible solutions). This is why the positional 'yesterday' is only given in the simple past example. Bengali does not have the Present Perfect Puzzle, and so allows positionals with present perfects.

a. unun-ṭa jòl-e ni (# tai deslai die
stove-CL light.ITR-3N NI (# so match with
jal-a-l-am)
light.ITR-CAUS-PST-1.PST)
'The stove hasn't turned on (# so I lit it with a match).'

b. unun-ṭa jol-l-o na (tai deslai die
stove-CL light.ITR-PST-3N.PST NEG (so match with
jal-a-l-am)
light.ITR-CAUS-PST-1.PST)
'The stove didn't turn on (so I lit it with a match).'

Finally, perfects show compatibility with all tenses, since they are themselves not tenses. This of course contrasts with a simple past, which is incompatible with present or future interpretations.

(11) a. I had washed the dishes yesterday (before she arrived).
b. I have now eaten 3 bananas.
c. I will have flown 20,000 miles by next year.

(12) I ate 3 bananas (*now/*by next year).

Bengali unfortunately has two confounds to applying this test. One is a general confound with the perfect construction generally, and the other is the negative perfect specifically. The general confound is that the perfect construction is incompatible with the future tense morphologically because the auxiliary used to construct the affirmative perfect cannot be inflected for the future. The auxiliary used, *ch(i)* is a reduced version of the existential copula *ach*, which also cannot be inflected for the future. Instead, a verbal compound construction is used with the light verb *thak* 'stay' is used both for the copula and the auxiliary. This process is completely general in the language, to the extent that the progressive, which also uses the auxiliary *ch(i)*, also cannot be inflected in the future. The perfect does permit both past and present tense inflection in its affirmative form, as was demonstrated in (2), and partially repeated below.

(13) a. notun gaṛi kin-e ch-e
new car buy-PRF AUX-3N
'They have bought a new car.'

b. tin-ṭe chiṭhi likh-e chi-l-am
3-CL letter write-PRF AUX-PST-1.PST
'I had written 3 letters.'

The confound with the *ni* construction is that no tense marking of any sort is permitted - past, or future.[5] The lack of the Present Perfect Puzzle in Bengali further confounds matters, because the mere presence of a past positional is not enough to ensure that the construction is a past perfect, as is the case in English.

[5]The present is unmarked.

However, careful management of contexts can illustrate that the *ni* construction is interpretable as a past perfect, by combining the resulting state persistance test with the predicted temporal variability. Given that the resulting state must last through to the end of the PTS, if a durational adverb is used to specify the PTS as being the past, a past perfect is predicted to have the meaning that the resulting state of the event held to the end of the PTS, but not after.

(14) gòtokal sòkal-e alarm-ṭa baj-e ni …
yesterday morning-LOC alarm-CL ring-3N NI …
≈'Yesterday morning the alarm hadn't rung …'

a. # …kintu 10 miniṭ deri-te baj-l-o
…but 10 minute late-LOC ring-PST-3N.PST
'…but it rang 10 minutes later.'

b. …kintu bikel-e baj-l-o
…but evening-LOC ring-PST-3N.PST
'…but it rang in the evening.'

The infelicity of the continuation in (14a) shows that the non-ringing state of the alarm persisted throughout the morning (i.e. it is a perfect), and the felicity of (14b) shows that the resultant state did end, and so the right boundary of the PTS is in the past (i.e. it is a past perfect). This contrasts with a simple past as in (15), which is compatible with either continuation in (14).

(15) gòtokal sòkal-e alarm-ṭa baj-l-o na …
yesterday morning-LOC alarm-CL ring-PST-3N.PST NEG …
'Yesterday morning the alarm didn't ring …'

a. …kintu 10 miniṭ deri-te baj-l-o
…but 10 minute late-LOC ring-PST-3N.PST
'…but it rang 10 minutes later.'

b. …kintu bikel-e baj-l-o
…but evening-LOC ring-PST-3N.PST
'…but it rang in the evening.'

So in summary, an understanding of the perfect as the introducer of an interval whose right boundary is manipulated by tense predicts three ways in which perfects should diverge from past perfectives, which, like perfects, convey anteriority. The first admitting temporal *since*-adjuncts, the second is showing some relevance of the event to the right boundary, and the third is compatibility with different tenses. Both the Bengali affirmative perfect and *ni* constructions pass all three tests (modulo the morphological confound for the future auxiliary in Bengali), and thus we can conclude that *ni* constructions are in fact negative perfects despite their lack of overt perfect morphology. This means that explaining why negative perfects lack overt perfect morphology and use negation unlike other negative clauses is indeed a puzzle we must explain.

3.2 Properties of negation

As noted in section 2, negation in Bengali is normally clause-final, however, in irrealis and participial clauses, it is pre-verbal. In this section, we shall see that despite the variation in placement, negation in both clause types behaves uniformly.

First, we consider the syntactic status of negation in Bengali. As argued by Zeijlstra (2014), languages vary as to whether their overt negative morpheme is phrasal or a head. In order to determine which, Zeijlstra (2014) proposes the *why not?* test. This test attempts to adjoin a phrasal adjunct 'why' to the word for sentential negation. If this adjunction is successful, it indicates that sentential negation is able to host a phrasal adjunct, and hence is a phrase. Zeijlstra (2014) notes one confound for this test: In some languages, the fragment answer 'no' and the sentential negation morpheme are identical. In this case, if the *why not?* test succeeds, it does not guarantee the phrasal status for sentential negation, because it is impossible to tell whether *why not?* uses sentential negation or the fragment answer. Although *na* in Bengali is fragment answer 'no', we see in (16) that neither it, nor the perfect negation *ni* can be used to ask *why not?*. This contrasts with the phrasal negative copula, which can be used to ask this question.

(16) a. * kèno na?
why NEG?

b. * kèno ni?
why NI?

c. kèno nò-e?
why NEG.COP-3N?
'Why not?'

On the basis of this test, we can conclude that both negative forms in Bengali are heads, not phrases. This test does not distinguish between the position that the negation is used in, however. In order to ensure that pre-verbal and clause-final negation pattern alike, we must turn to other tests.

Both *ni* and *na* (both pre-verbally and clause-finally) pattern alike for prosodic word-hood with the verbal complex. Despite allowing a good deal of freedom in scrambling, no phrasal material can intervene between negation and the verb, regardless of the form or position of negation.[6] This is shown in (17), below.

(17) a. {mach} kha-i {*mach} na/ni {mach}
{fish} eat-1 {*fish} NA/NI {fish}

[6]Lahiri (2000) observes however, that emphatic particle *-i* and the additive particle *-o* can intervene between the verb root and negation if focus is on the verb in matrix declaratives. In irrealis clauses, the negation can only be separated from the verb by phrasal material if there is verum focus and the emphatic particle is placed on the negation. I take both of these to instantiate a situation where a head (i.e. either the verb or negation) has undergone movement to a focus position (allowing for head movement to land in specifiers as in Matushansky (2006)). Thus the separability of the verb from negation is caused specifically by contrastive focus on one part of the verbal complex to the exclusion of the other.

'I {don't eat/haven't eaten} fish.'

b. …jèno {o-ke} na {*o-ke} dekh-te pe-e ch-o
…C.IRR {3N-OBL} NEG {*3N-OBL} look-INF receive-PRF AUX-2N
{o-ke}
{3N-OBL}
'…as if you haven't seen him/her'

So we see that morphologically, both pre-verbal and clause-final negation appear to form a complex with the verb, and that both clause-final *na* and *ni* behave alike in this regard.

Having established that all three negative forms (two clause-final and one pre-verbal) have the same syntactic status and form a complex with the verb, we turn now to establishing their semantic scope. Bengali lacks negative quantifiers, instead using existentials that are outscoped by sentential negation. In (18), we see that this technique with all three forms of negation, meaning that the head where negation is interpreted is uniformly above the subject position in all clauses.

(18) a. keu kichu bòl-e na/ni
someone something say-3N NEG/NI
'Nobody says/has said anything.'

b. dhòro keu kichu na bol-e ch-e
hold.IMP.N someone something NEG say-PRF AUX-3N
'Suppose nobody has said anything.'

Now we have established that all three negative forms pattern alike in terms of syntactic status as heads, morphological status as part of the verb complex, and semantic position as scoping over subjects. This indicates that the variation between *na* and *ni* in some perfects must be incorporated into whatever proposal is made to account for the variation between negative forms.

The question remains how exactly negation in irrealis clauses becomes pre-verbal given that Bengali is generally a head-final language. Simpson and Syed (2014) and Ramchand (2014) provide two opposing views, focussing mainly on participial clauses, which also have pre-verbal negation. Simpson and Syed (2014) proposes that pre-verbal negation is structurally low, which Ramchand (2004) notes cannot be the case in conditionals, because negation is interpreted above the subject. This same fact was demonstrated above for irrealis clauses in (18). Ramchand (2014) instead argues that a left-branching higher head is responsible for this order by triggering movement of the negation to it in some cases. That the left periphery in Bengali is head-initial while the lower spine is head-final is a common view since most complementizers appear to the left of the clause they introduce, as shown in (19).

(19) ḍaktar-ra bòl-e [je roj adh ghònṭa bèam kòra bhalo]
doctor-PL.HUM say-3N [C daily half hour exercise do.NMLZ good]
'Doctors say that exercising for a half hour every day is good.'

I follow Ramchand's view, but change the details slightly to account for irrealis clauses instead of participial ones. I assume that a left-branching Mood head in the COMP domain is responsible for triggering movement of the Neg head to it when it hosts an [IRR]ealis feature. As a result, this is linearised to the left of the verb, however, V, *v*, T, and Mood still form a complex of some sort (something looser than a prosodic word but tighter than a constituent). The exact implementation of this head movement is not crucial for this project, and the mechanism of word-building required as well the relation between the verb and the other elements in the complex (auxiliaries and negation) are left for future work. The structure of the spine in Bengali generally is discussed later in section 4.2. The crucial takeaway from the above discussion is that pre-verbal *na*, clause-final *na*, and *ni* all pattern alike for wordhood with the verb, semantic scope, and syntactic type.

3.3 Ellipsis

As shown in section 2, although *ni* is the form of negation that conveys perfect meaning, if a TP is elided under identity with an antecedent that contains a perfect, the negation outside the ellipsis site is the elsewhere negation *na* instead of the perfect negation *ni*. This would of course be the expected result if the ellipsis site did not contain a perfect to begin with. Such a state of affairs might arise through three means. It may be that the observed negation is not sentential negation at all, but rather constituent negation on one of the surviving elements. If the negation is indeed sentential, it may be that the ellipsis site contains no structure at all, but rather an anaphor of the appropriate type that simply gets its referent from the antecedent. This is the view of ellipsis as deep anaphora (Hankamer and Sag, 1976) also known as LF-copying. If this is not the case and it is established that the ellipsis site does contain structure, then we are dealing with surface anaphora (Hankamer and Sag, 1976) also known as PF-deletion.[7] In this view, the ellipsis site could still fail to contain a perfect if the identity conditions that license ellipsis are loose enough to permit an antecedent with a perfect to license deletion of a phrase without a perfect.

In this section, we shall see that the clause-final negation in elliptical constructions outscopes subjects when when separated from them by objects, and thus cannot be constituent negation. Then, on the basis of case matching and locality restrictions, we shall see that the ellipsis site does contain syntactic structure. We shall further see that the elided verb must obligatorily be interpreted as a perfect, having the key features of perfects discussed in section 3.1. Hence the presence of *na* instead of *ni* outside the ellipsis site does indeed require an explanation.

That negation in ellipsis constructions is not constituent negation can easily be observed through the example in (20).

[7]Merchant (2018) provides an excellent overview of different approaches to ellipsis and arguments in favour of each view. The reader is referred to that work for further information about LF-copying vs PF-deletion.

(20) onek-ke kal badam bec-e chi-l-am, kintu
many-OBL yesterday nuts sell-PRF AUX-PST-1.PST, but
kau-ke miṣṭi Δ na
someone-OBL sweets Δ NEG
'Yesterday I had sold nuts to many people, but sweets to nobody.'

Recall that Bengali lacks negative quantifiers, and so uses existential quantifiers and sentential negation to convey the same meaning. In (20) we see that the existential subject in the second clause is outscoped by negation across an object and the ellipsis site. This shows that the negation could not plausibly be constituent negation on the subject, as it is extremely discontinuous from it.

Having established that the negation is indeed sentential in the elliptical example, we turn now to determining the nature of the ellipsis site itself. Merchant (2018) presents a variety of tests that have been proposed to argue for the existence of structure within ellipsis sites. Many are specifically for sluices or nominal ellipsis, however case matching and locality restrictions are both applicable and testable in Bengali.

Case matching examples involve an antecedent with some kind of exceptional case assignment property. If an item suriving ellipsis licensed by such an antecedent requires the exceptional case, this suggests that the exceptional case licensor was present within the ellipsis site itself. This is demonstrable in Bengali with differential object marking (DOM) and quirky subject marking.

DOM in Bengali requires human objects but not subjects to be marked with the oblique case as in (21a). Non-human objects are unmarked as in (21b).

(21) a. senanayok-(*ke) soinik-ṭa-*(ke) tòrjon kor-l-en
general-(*OBL) soldier-CL-*(OBL) repirmand do-PST-H
'The general reprimanded the soldier.'

b. ṭhakur ḍal-ṭa-(*ke) phoṭ-a-l-o
cook lentil-CL-(*OBL) boil-CAUS-PST-3N.PST
'The cook boiled the lentils.'

If a clause is elided and a human-denoting noun survives, it must carry oblique case if it was the object of the elided clause as in (22a) but not if it was the subject, as in (22b).

(22) a. kukur-ṭa chele-ṭa-*(ke) taṛa kor-e chi-l-o, kintu
dog-CL boy-CL-*(OBL) chase do-PRF AUX-PST-1.PST, but
me-ṭa-*(ke) Δ na
girl-CL-*(OBL) Δ NEG
'The dog had chased the boy, but not the girl.'

b. me-ṭa kukur pòchondo kor-e, kintu chele-ta-(*ke) Δ na
girl-CL dog like do-3N, but boy-CL-(*OBL) Δ NEG
'The girl likes dogs, but the boy doesn't.' (Lit. …'not the boy')

Quirky case shows the same pattern as DOM. Subjects of certain verbs like *lag* 'feel' obligatorily take genitive subjects. These genitive arguments behave subject-like with respect to controlling adjunct PRO, as shown in (23).

(23) Syam$_i$-er dukkho$_j$ lag-ch-e [PRO$_{i/*j}$ Ram-ke kòsṭo di-e]
Syam-GEN sadness feel-PROG-3N [PRO$_{i/*j}$ Ram-OBL pain give-PRF]
'Syam feels sad because he/*sadness caused Ram pain.'

When a noun survives ellipsis under identity with such a verb, it must also carry quirky case if it is the subject, as shown in (24).

(24) masi-r miṣṭi-gulo bhalo leg-e ch-e, meso-*(r) Δ na
aunt-GEN sweet-PL good feel-PRF AUX-3N, uncle-*(GEN) Δ NEG
'Auntie liked the desserts, Uncle didn't.' (Lit. …'not Uncle')[8]

Both DOM and quirky case demonstrate that whatever requires exceptional case assignment (structural position as an object in the case of DOM, and relation to certain verbs in the case of quirky case) must exist in the ellipsis constructions. This is straightforwardly expected if the ellipsis site does indeed contain the structure that requires the exceptional cases, but unexpected on the view that the ellipsis site contains just a silent pronoun of the appropriate type.

Locality restriction tests involve attempting to elide a constituent, leaving an element which is inside a putative island. Before demonstrating island sensitivity in ellipsis, we must first find some islands. Bengali is standardly thought of as a wh-in-situ language, however wh-phrases must move obligatorily in long-distance questions, as Simpson and Bhattacharya (2003) demonstrate. The position that wh-words must land in is below a high topic, which may be occupied by a matrix subject. The movement is visible when comparing a long-distance question as in (25a) with an embedded question in (25b).

(25) a. ṭhakur [kon mach-ṭa]$_i$ bol-l-o [t$_i$ kin-te]
cook [which fish-CL]$_i$ say-PST-3N.PST [t$_i$ buy-INF]
✓'Which (kind of) fish did cook say to buy?'
✗'Cook said which (kind of fish) to buy.'

b. ṭhakur bol-l-o [kon mach-ṭa kin-te]
cook say-PST-3N.PST [which fish-CL buy-INF]
✗'Which (kind of) fish did cook say to buy?'
✓'Cook said which (kind of fish) to buy.'

In (26), which are adapted from examples by Simpson and Bhattacharya (2003), we see that complex DPs and ajduncts are islands in Bengali, on the basis of the inability to wh-extract out of them.

[8]Bengali has a bifurcate collateral kinship system (i.e. Sudanese-type) with further distinctions for blood vs. marriage, and for some relations, relative age. The term *masi* refers to the speaker's mother's sister, and *meso* is her male spouse.

(26) a. * tumi ki$_i$ {man-l-e} [Mina-r dabi je cor t$_i$
2SG.N what$_i$ {accept-PST-2N.PST} [Mina-GEN claim C thief t$_i$
curi kor-l-o] {man-l-e}
steal do-PST-3N.PST] {accept-PST-2N.PST}
Int: *'What do you accept Mina's claim that a thief stole?'

b. * Jonaki$_i$ ke$_j$ party cheṛ-e col-e gè-l-o [karon t$_j$
Jonaki$_i$ who$_j$ party leave-PRF go-PRF go-PST-3.PST [because t$_j$
o$_i$-ke òpoman kor-l-o]
3$_i$-OBL insult do-PST-3.PST]
Int: *'Who did Jonaki leave the party because insulted him?'

And we see in (27), attempting to elide an island leaving a remnant likewise results in ungrammaticality, both for complex DPs and adjuncts.

(27) a. * Mina-r dabi je cor hire-gulo curi kor-e ch-e
Mina-GEN claim C thief diamond-PL steal do-PRF AUX-3N
man-l-am, kintu panna-gulo Δ na
accept-PST-1.PST, but emerald-PL Δ NEG
Int: *'I believe Mina's claim that a thief stole the diamonds, but not ~~Mina's claim that a thief stole~~ the emeralds.'

b. * Jonaki party cheṛ-e col-e gè-l-o karon èk
Jonaki party leave-PRF go-PRF go-PST-3N.PST because one
nimòntrito o-ke òpoman kor-l-o, kintu
guest 3N-OBL insult do-PST-3N.PST, but
nimòntrònkòrta Δ na
host Δ NEG
Int: *'Jonaki left the party because a guest insulted him, but not ~~because~~ the host ~~insulted him~~.'

As Merchant (2018) notes, if island restrictions are structural in any way, and if ellipsis involves movement out of real structure followed by deletion, the result should be ungrammatical because of whatever prohibits movement out of islands. If however, ellipsis involves silent pronouns, locality restrictions of this sort are unexpected.

Given the locality restrictions and case matching present with Bengali negative ellipsis, we can conclude that the ellipsis site in these constructions does indeed contain structure. However, only containing structure is not enough to rule out a simple, plausible explanation for why *na* appears in all ellipsis constructions observed. Perhaps there is no perfect within the ellipsis site, even if there is structure, and hence we observe the appropriate negation for the elided verb. This amounts to saying that whatever parallelism requirement exists for licensing ellipsis is not sensitive to perfects. We can see that this is not the case based on the semantics of the ellipsis site. Recall that perfects of perfectives in Bengali have a requirement that the resultant state must hold to the end of the perfect time span. If there is no perfect inside the ellipsis site, we do not

expect to see a resultant state requirement. Yet, we observe in (28) that such a requirement holds.

(28) choṭo unun-ṭa jol-e ch-e, kintu bòṛo-ṭa Δ na (# tai
small stove-CL light.ITR-PRF AUX-3N, but big-CL Δ NEG (# so
deslai die jal-a-l-am)
match with light.ITR-CAUS-PST-1.PST)

'The small stove has turned on, but not the big one (# so I lit it with a match).'

Since the continuation suggesting the large stove has been lit is infelicitous, it demonstrates that the meaning of Δ must be that of a perfect. We have now established that in negative elliptical constructions under identity with a clause containing a perfect verb, the ellipsis site contains a perfect, and negation is sentential. Thus, we would expect *ni* as the negation, not the observed *na*.

3.4 Summary

In the preceding sections we have learned about the nature of perfects, negation, and ellipsis in Bengali. The key takeaway from the first section is that the *ni* constructions are true perfects like their affirmative counterparts. From the second section we learned that pre-verbal and clause-final negation (both *ni* and *na*) appear to syntactically, semantically, and morphologically behave alike, suggesting they are the same thing. Finally, from the investigation of ellipsis we have learned that ellipsis sites contain perfects, and the negation outside them is sentential.

This presents a picture of how to negate perfects that can be summarized as follows: Negating a perfect in Bengali normally requires omitting the perfect marker and auxiliary, and using a special negation *ni* instead of the default *na*. However, in irrealis clauses and with ellipsis, we obligatorily use *na*, even though the two key ingredients that trigger the alternation - negation and perfect - have constant properties in matrix declaratives, irrealis, and ellipsis constructions. Thus, the primary puzzle of the paper is to account for the distribution of *ni* and *na*, not only in matrix declaratives, but also in irrealis and ellipsis contexts.

4 Proposal

This section lays out the proposed morphological analysis of the facts observed. We begin by considering the only existing proposal of the distribution of negative forms in Bengali, which is Ramchand's 2004 semantic account. On the basis of the irrealis and ellipsis data, it will be argued that such an account is not tenable. The morphological alternative will then be motivated and introduced.

4.1 A semantic story and its issues

Ramchand (2004) presents a semantic account of the distribution of *ni* and *na*. On this view, both are negative quantifiers, but with differing semantics. This places restrictions on their positions and distributions, purportedly accounting for why *ni* is required to negate perfects instead of *na*. For the semantics of the perfect, Ramchand (2004) adopts the analysis of English perfects from Parsons (1990), according to which the culmination of every event leads to a resultant state of the event having culminated, which holds forever after. Readers will recognize this as an *extended-now* theory of the perfect, like Iatridou et al. (2001), albeit with less explicit attention to the properties of the boundaries. While Ramchand (2004) does not provide lexical entries for either negative form, she does describe them.

(29) Descriptions of *ni* and *na* (Ramchand, 2004, 45)
   a. *na* "is a binder of the event variable of an utterance"
   b. *ni* "is a binder of the time variable of an utterance"

Furthermore, the negation of events appears to scope under tense, as per the truth conditions Ramchand (2004) gives for an example sentence, repeated below in (30).

(30) Ramchand's, 2004 example (23), pg. 46

   ram am-ṭa khe-l-o na
   Ram mango-CL eat-PST-3N.PST NEG

   'Ram didn't eat the mango.'
   $\exists t : [t < t*]\neg\exists e[t_f \in \tau(e) = t][\texttt{eating}(e) \wedge \Theta_1(e, \texttt{Ram}) \wedge \Theta_2(e, \texttt{the mango})]$

In (30), t_f refers to the final moment of $\tau(e)$, the runtime of the event. So this states that there is some past time, at which no event exists matching the description that the final moment of the event is at the past time, and it is an eating event with 'Ram' and 'the mango' as participants. Crucially, the negation must scope under tense because Ramchand (2004) assumes that in its absence, there is existential quantification over events before below tense.

This account of the semantics of *na* as an event quantifier combined with a view of perfects as introducing a resultant state straightforwardly predicts that *na* should be incompatible with perfects. (Ramchand, 2004, 46) presents the following example to illustrate why.

(31) Ramchand's 2004, example (25), pg. 46

   *ram am-ṭa khe-e ch-e na
   Ram mango-CL eat-PRF AUX-3N NEG

   Int: 'Ram hasn't eaten the mango.'
   $\exists t : [t = t*]\neg\exists s[\tau(s) \odot t]$
   $[\exists e[s = \texttt{R} - \texttt{state}(e) \wedge \texttt{eating}(e) \wedge \Theta_1(e, \texttt{Ram}) \wedge \Theta_2(e, \texttt{the mango})]]$

The truth conditions in (31) assert that there does not exist a state overlapping the present that is the resultant state of an event, however it asserts that the event does exist. This incoherent in the system, since every culminated event has a resultant state. Hence, negating a perfect with *na* is impossible.

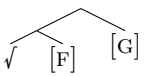
While this account captures the basic distribution of *ni* and *na* in Bengali, it runs into issues with the ellipsis and irrealis constructions introduced in section 2. In particular, this account rules out *na* with perfects by means of semantic incoherence. This is problematic given that in both the irrealis and the ellipsis constructions, we see that *na* is able to co-occur with a perfect. In depth analyses of the properties of negation in section 3.2 showed that *ni*, and both pre-verbal and clause-final *na* pattern alike in terms of prosodic closeness with the verb, syntactic status, and semantic scope. This demonstrates that pre-verbal *na*'s compatibility with overt perfects is unexplained on the semantic view. Furthermore, it was established in section 3.3 that the ellipsis site contains the structure of a perfect, and so the semantic account cannot explain why *na* is not only acceptable, but required with an elided perfect if it semantically ruled out with an overt perfect.

Thus, the semantic account predicts a narrower distribution for *na* than is actually observed. Before moving on to the details of the morphological alternative, the next section outlines the structure of the spine in Bengali that will underlie the morphological analysis.

4.2 The structure of the spine

Baker (1985) proposed the Mirror Principle in order to account for the close observed relationship between the surface order of morphemes in Chamorro and Quechua and their scope interpretations. The Mirror Principle requires that given the tree in (32a), the possible linearised outputs are in (32b).

(32) a.



b. i. root-F-G
ii. G-root-F
iii. F-root-G
iv. G-F-root
v. * root-G-F
vi. * F-G-root

In other words, given two terminals and a root, the exponent of the more distant terminal cannot intervene between the exponent of the root and the nearer terminal. The Mirror Principle functions as a sort of "What you see (syntactically) is what you get (morphologically)" rule, allowing some amount of structural information to be reconstructed from linear order of morphemes. In languages like Bengali where all the pieces we are trying to place are suffixes, this becomes easier, since only options (32b-i) and (32b-v) could be observed

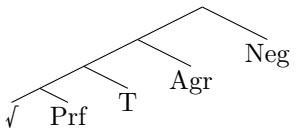
on the surface. This makes it possible to largely 'read-off' structure from the order of morphemes.[9] Consider the two examples in (33), demonstrating the positions of the perfect and negation.

(33) a. almari-ṭa bani-e ch-i
wardrobe-CL build-PRF AUX-1
'I have built the wardrobe.'

b. mangso kha-i na/ni
meat EAT-1 NEG/NI
'I don't eat/have not eaten meat.'

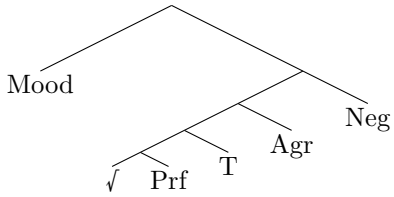
From (33a) we can conclude that Prf is closer to the verb root than Agr is, and from (33b) we can conclude that Agr is closer to the verb root than Neg is. T is exponed separately from Agr, and when it is overtly present, it is closer to the root than Agr, as seen in (1) for example. From this, we can deduce that the spine in Bengali looks as follows:

(34)



From this structure, it is unclear what the position of the auxiliary is in (33a). I assume that the auxiliary is inserted post-syntactically to carry the morphology from T and Agr, which would otherwise be stranded without a host, because the inflectional slot of the verb is occupied by the perfect. This is the analysis of auxiliaries proposed in Bjorkman (2011), where they are late-inserted hosts of overflow morphology. So there is no structural position that corresponds to the auxiliary. Finally, as was noted in section 3.2, in order to account for the position of negation in irrealis clauses, a left-branching Mood head is required above Neg, which will attract Neg to undergo head-movement to it when it contains an [IRR]ealis feature. This is based on the analysis of the position of negation in participial clauses proposed by Ramchand (2014). So the spine then looks as follows:

(35)



Now we turn to outlining the morphological proposal that is able to capture the distribution of the facts observed.

[9]For this to work, it is necessary that that one affix on the surface corresponds to one terminal in the structure. This is of course not guaranteed, as post-syntactic operations like Fission (Noyer, 1992) can result in the contents of one syntactic terminal being pronounced as multiple affixes. However, in the absence of evidence in favour of Fission, I will assume it is not occurring, and that each affix corresponds to one terminal.

4.3 A morphological proposal

Consider the following examples showing a negated simple present in (36a) and a negated present perfect in (36b).

(36) a. o-ra mangso kha-e na
3.PROX-PL.HUM meat eat-3N NEG
'They do not eat meat.'

b. o-ra mangso kha-e ni
3.PROX-PL.HUM meat eat-3N NI
'They have/had not eaten meat.'

The only difference between the two examples is the form of the negation. So the most straightforward way to capture this is to analyse *ni* as conveying both sentential negation and a perfect. While Ramchand (2004) proposed to pursue this line of reasoning by building perfect meaning into *ni* and making perfect meaning incompatible with *na*, there is another way to make use of the same intuition. If *ni* were to be the realisation of both the perfect and negation simultaneously but not contain the semantics for both of them, the issues of the semantic approach could plausibly be overcome by placing contextual restrictions on the use of this portmanteau form.[10] This is the approach adopted in this paper.

The specific model of morphology adopted is Distributed Morphology (DM) (Halle and Marantz, 1993, 1994, among others). In this framework, syntax operates at the sub-word level, and is phonology free. Morphology is the portion of the derivation which is responsible for establishing correspondence between features bundles on syntactic terminals and phonological strings that expone the features, by means of an operation called vocabulary insertion. However this correspondence can be obscured by other operations which can dislocate, fuse, separate, impoverish, and enrich the feature bundles on terminals.

For a successful analysis, the first question to address is how exactly the portmanteau is to be formed. Various proposals exist in the literature, but as we shall see, only one is applicable to the case of Bengali. Among the earliest analyses of portmanteaux was that of Head Movement and Fusion. This view proposes that Head Movement brings two feature bundles into a sisterhood relation, and then Fusion replaces the pair of sisters with a single terminal consisting of the union of features on the sisters. Crucially, since this approach relies on Head Movement, is constrained by the Head Movement Constraint (HMC) (Travis, 1984), which bans Head Movement to a non-adjacent head. But this is exactly the situation in Bengali. We wish to form a portmanteau of Prf and Neg, to the exclusion of the intervening Agr, which is exponed separately.[11] In fact, the non-locality of the two heads we wish to jointly expone is an issue for

[10] I treat portmanteau as a non-theoretical description here. By it I simply mean that a single seemingly non-decomposable form is expressing meanings that are demonstrably separable elsewhere in the language.

[11] There is an analysis reminiscent of a Duke of York gambit (Pullum, 1976) that could rescue this approach. Head Movement and Fusion could bring all the heads from Prf through

many proposals about the nature of portmanteaux. Svenonius (2016) proposes that vocabulary insertion can target *spans* of structurally adjacent heads, and Ostrove (2018) proposes that it can target *stretches* of linearly adjacent feature bundles after the heads are linearised. However, since Prf and Neg appear to be neither structurally nor linearly adjacent in Bengali, neither approach is applicable.

Theories of head movement of course do exist which do not predict sensitivity to the HMC. In particular, Matushansky's 2006 proposal that head movement involes movement to a specifier followed by morphological merger is one such theory. Harizanov and Gribanova (2018) propose Matushansky's mechanism is what underlies syntactic head movement, which is not subject to the HMC, whereas post-syntactic head movement is achieved by means of a symmetric merger operation which is sensitive to adjacency and hence is subject to the HMC. So suppose that Prf undergoes syntactic head movement to Neg in Bengali, accounting for *ni* as a portmanteau. This view encounters two problems. Firstly, we expect to find the differences between syntactic and post-syntactic head movement that Harizanov and Gribanova (2018) argue for. In particular, we expect semantic scope effects, since the head movement not subject to the HMC is occurring within the narrow syntax, and thus has effects both for PF and LF. Recall that the *ni* constructions semantically behave like perfects for diagnostics based on Iatridou et al. (2001). The semantics of the perfect involves taking a predicate of events and introducing an interval containing the event, which will be further modified by T. Being interpreted above Neg would require it to take a truth condition as an argument, meaning not only the scope, but also the semantics of the moved vs. unmoved Prf would need to differ, despite the fact that we see no evidence of difference in meaning. Secondly, the feature on Neg that would trigger head movement of Prf would need to do so only in case the Mood head above it hosted a [-IRR] feature. But for Neg to know this, it must wait until Mood is merged before attracting Prf to its specifier. This violates the Extension Condition (Chomsky, 1995, 190), since the Merge of Prf and NegP would target the sister of Mood, rather than the root, and undermines one of the motivating factors behind the approach of Matushansky (2006), which seeks to make head movement compliant with the Extension Condition. Thus, attempting to skirt locality restrictions by adopting a specific mechanism of head movement does not appear to be helpful for the Bengali facts.

Trommer (1999), however, proposes one analysis of portmanteaux that does not inherently have locality restrictions. In this view, an apparent portmanteau can arise as the result of a conspiracy of two cases of contextual allomorphy. If features [A] and [B] are exponed together, but we have evidence that they are on

to Neg into a single complex head, followed by Fission, which would separate out just Agr. As Pullum (1976) notes, there is no reason to believe that there is an innate bias against such analyses. However, in this case it is mysterious why Agr should require fissioning out to expone separately and T should not when (a) both are normally exponed independently, and (b) non-agreeing clausal constructions exist, including all quirky subject verbs. So while it is not possible to rule out such an analysis, I do not pursue it further given that it appears implausible in this language specific situation because of the behaviour of tense and agreement in the language more generally.

different terminals, Trommer (1999) proposes that [A] might be exponed as the apparent portmanteau in the context of [B], while [B] is null in the context of the portmanteau (or vice versa). Thus, although [A] and [B] appear to be jointly exponed, it is only in fact [A] that has any overt realisation in this analysis. This approach has no inherent limits on locality beyond those that are imposed by the mechanism of contextual allomorphy to begin with. For now, the issue of locality will be put on hold while the analysis is spelt out. However, it will be discussed in detail in section 5, where the ramifications of the theory are investigated. Applying this analysis to Bengali, we will want to realise one of [NEG] or PRF as *ni* in the context of the other, while the other is null in this same context.

The analysis in totality will need to account for the following facts:

(37) a. Negative perfect exceptionalism
   i. Lack of overt tense marking
   ii. Presence of *ni* instead of the overt perfect and negation
   b. Lack of exceptionalism in irrealis clauses
   c. Lack of exceptionalism in elliptical constructions

Recall that *ni* constructions, despite the absence of overt tense marking, were shown to be compatible with interpretations as past perfects as well as present perfects in section 3.1. Thus, in accounting for the absences of tense marking in negative perfects, it is important to keep in mind that interpretable tense is structurally present, at least at LF, but not pronounced at PF. This can be achieved by means of a contextual impoverishment rule which deletes certain features in a particular context. For concreteness, I assume a three-way tense distinction in Bengali where T can host either [PST], [FUT], or no feature at all. The present is intentionally being modelled as the absence of a feature because it is compatible with past interpretations (e.g. in narrative contexts) and future interpretations (e.g. when expressing an intention). Recall that the future is generally incompatible with the default perfect construction, requiring a light verb *thak* 'stay' instead of the auxiliary. Hence, the impoverishment rule need only apply to [PST].

(38) Contextual impoverishment of past in negative perfects:
[PST] → ~~[PST]~~ / _ [PRF], [NEG], [-IRR]

This further accounts for why the default allomorph of agreement is used in negated perfects rather than the past allomorph. Due to the absence of a [PST] features in T, the φ features trigger insertion of their elsewhere allomorphs in negative perfects since the conditions for inserting the more specific past forms are not met. This acounts for the first half of negative perfect exceptionalism. Let us turn now to the actual behaviour of perfects and negation. The following vocabulary insertion rules capture the patterns described in section 2:

(39) Vocabulary insertion rules for perfects and negation

a. [PRF] → ∅ /_ [NEG],[-IRR]
b. [PRF] → -e[12]
c. [NEG] → ni /_ [PRF],[-IRR]
d. [NEG] → na

The insertion rules in (39a) and (39c) conspire to produce an apparent portmanteau of negation and the perfect. This of course raises the question as to why [PRF] should be null rather than [NEG]. Consider what would happen if we chose the reverse options: [PRF] would be realised as *ni*, but would be closer to the root than the exponent of Agr. Since this is not what we see on the surface, we would need a local dislocation operation to switch the order of agreement and *ni*. While local dislocations are permitted in DM, such an analysis gains nothing over the one proposed, yet requires one extra operation. Thus, under the assumption that the simplest theory is to be preferred, I will proceed assuming that *ni* is indeed the exponent of negation.

The impoverishment rule in (38) and the vocabulary insertion rules in (39) together account both for negative perfect exceptionalism in the default case, and the lack of exceptionalism in irrealis clauses. This is because the impoverishment rule in (38) and the two insertion rules which contribute to exceptionalism, (39a) and (39c) are all context sensitive to the presence of an [-IRR] feature, and thus will only occur in realis environments. If a Mood head is present and bears a [+IRR] feature, neither impoverishment nor the insertion rules responsible for *ni* will have their contexts met. Thus the default negation and perfect exponents will be inserted instead, just as with affirmative perfects and regular negatives.

This leaves only the lack of exceptionalism in ellipsis cases to be accounted for. Given that the exceptionalism is achieved by rules which are context-sensitive, if ellipsis can manipulate the structure, the context to trigger the exceptional cases can be eliminated, and thus their activation blocked. Let us consider possibilities for how to model ellipsis that might achieve this goal. I adopt a featural licensing model of ellipsis, as presented by Merchant (2001). Once identity for ellipsis is established somehow (it is not important for this discussion how exactly), the constituent to be elided is marked by a features E. I assume this feature percolates down to the terminals dominated by the maximal node that is to be elided.

Recall that section 3.3 demonstrated the presence of the syntactic structure of a perfect inside the ellipsis site. Given the presence of structure inside the ellipsis site, silencing the terminals could be achieved through one of three means. The first option is to model ellipsis is an impoverishment operation, deleting the features on terminals marked with E, thereby blocking insertion of any exponents. The second option is to model ellipsis as a vocabulary insertion rule that

[12]The overt exponent of the perfect triggers raising of the vowel in the verb root by a regular morphonological rule, and so technically, the exponent likely has a floating high feature that anchors on the verb. See Sanyal (2012) for a discussion of the vowel system in Bengali and Worbs and Zimmermann (2016) for an analysis of similar facts in neighbouring Assamese, which should straightforwardly extend to Bengali. This will not be discussed in detail as the phonology of the perfect is not the subject of this article.

realises any terminals marked with E as silence. Finally, the third option is to model ellipsis as a constraint penalising correspondence between terminals marked with E and overt exponents. The third option is clearly too late an implementation of ellipsis in the derivation, since the context for insertion of *ni* in (39c) would still be met before ellipsis had a chance to silence the TP. The second option is in fact also too late. Suppose vocabulary insertion were additive, in that it added phonological content to terminals, but did not delete morphosyntactic features. If insertion proceeds root-ourward as Bobaljik (2000) proposes, the ellipsis rule would trigger the insertion of ∅ as the exponent of [PRF], just like rule (39a), and the context for (39c) would be met, resulting in the insertion of *ni* outside the ellipsis site. Thus an additive insertion algorithm makes the second option to model ellipsis insufficient. Now suppose vocabulary insertion were replacive, in that it deleted morphosyntactic features when adding phonological content. If this were the case, rule (39c) would not be triggered in any contexts - ellipsis or otherwise. Even in non-elliptical contexts, rule (39a), which expones [PRF] would delete the feature, thereby bleeding application of rule (39c). So a replacive vocabulary insertion algorithm is not able to capture the basic facts, although it can capture the ellipsis cases.

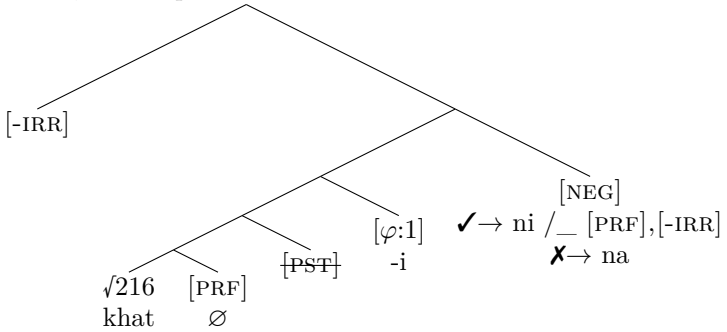
In order to capture the facts at hand, I propose that vocabulary insertion is additive, and so in non-eliptical contexts, (39a) leaves the feature [PRF] intact, triggering rule (39c) later. In order to bleed (39c) in elliptical constructions, I propose to analyse ellipsis as the following impoverishment rule:

(40) Ellipsis as impoverishment: $[(\pm)\text{F}]_{\text{E}} \rightarrow \cancel{[(\pm)\text{F}]_{\text{E}}}$

As a result of this impoverishment, there will no longer be any [PRF] features in the structure, and hence the default negation insertion rule (39d) will apply instead of rule (39d). Thus, elliptical contexts will result in the default negation appearing instead of *ni* despite the presence of a perfect inside the ellipsis site.

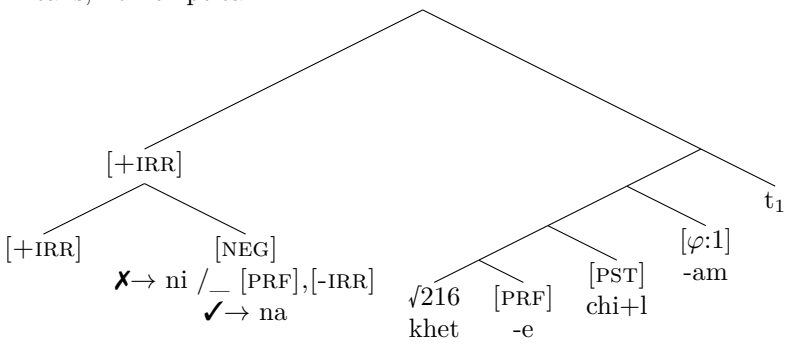
The following trees illustrate the derivation at the point when insertion is targeting negation in the default case, with an irrealis mood, and with ellipsis.

(41) Realis, non-elliptical

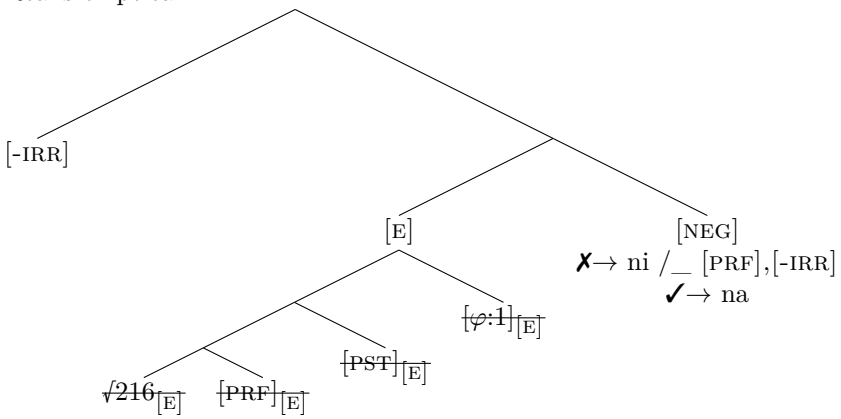


In this case in (41), both the general rule for negation insertion in (39d) and the more specific rule for *ni* in (39c) are met, and so the more specific rule takes precedence, resulting in the insertion of *ni*.

(42) a. Irrealis, non-elliptical



b. Realis elliptical



However, in (42), only the default rule can apply since the context to insert *ni* is not present, and so rule (39c) cannot apply. In case of the irealis construction, this is because the context does not contain the feature [-IRR], and in the case of ellipsis, this is because the context does not contain [PRF].

So we see that the morphological analysis put forth successfully account for both exceptional properties of negative perfects, as well as why there is no exceptionalism with irrealis clauses and ellipsis. This account crucially requires the vocabulary insertion algorithm to be additive, contextual allomorphy to allow for bidirectional sensitivity at a distance, and for ellipsis to be implemented early, as obliteration.

5 Implications

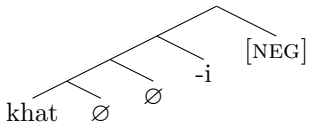
In order to account for the observed facts, the proposed analysis made certain claims about the mechanism of contextual allomorphy and ellipsis. In this section we shall see what the implications and predictions of these claims are.

5.1 Nature of the insertion operation

The direction of sensitivity in cases of contextual allomorphy has been a point of debate in the morphology literature. Bobaljik (2000) has proposed that the vocabulary insertion algorithm operates root-outward and is replacive, making clear predictions that all inward (i.e. toward the root) sensitivity should be to phonological features (or class diacritcs) only, and all outward sensitivity should be to morphosyntactic features only. This is because at any point, a node below the current point of insertion has already undergone insertion and so its morphosyntactic features have been replaced by insertion of phonology. Nodes further away from the root than the current target of insertion have not undergone insertion yet, so they only host morphosyntactic features. But the Bengali data makes clear why this is not a tenable stance.

Suppose insertion were replacive such that only the inward sensitivity possible was to phonological features. Consider the options available for insertion to Neg in a negative present habitual versus a negative present perfect. Both would have the structure in (43)

(43)



In the case of the negative present habitual, the lower ∅ is the exponent of aspect, while in the negative perfect it is the silent perfect. Given that the two structures cannot be distinguished without reference to the features that being silently exponed, inward sensitivity to morphosyntactic features must be allowed in order to condition the correct insertion rule for [NEG], contra the claims in Bobaljik (2000). This crucially means that the insertion algorithm must be additive, rather than replacive. Carstairs (1987) and subsequently Carstairs-McCarthy (2001) noted that inward sensitivity to morphosyntactic features appears to be necessary in other languages as well, based on evidence from Latin and Hungarian agreement. In Bengali, we see that inward sensitivity to morphosyntactic features appears is necessary for exponing agreement.

Recall that the general verbal template in Bengali is √-(Perf/Prog)-T-Agr.[13] On the basis of the Mirror Principle (Baker, 1985), it was taken to hold that Agr is further away from the root than T is. Yet Agr in Bengali suppletes for T across all persons. The table below illustrates agreement patterns. Bengali verbs agree with their subjects for person and honourificity, denoted Intimate, Neutral, or Honourific, but not number.

This kind of multiple exponence of features is well-known, and various solutions have been proposed in the literature. Adger et al. (2003) propose a particular mechanism for labelling that captures these kind of very local inward sensitivities to morphosyntactic features without having to wholesale abandon

[13]The past habitual is exponed as a single morpheme, but the past progressive and past perfective use the same default past marker. Aspect is not being investigated in this paper, so I will leave it out of the subsequent discussion.

Table 1: Bengali agreement paradigm

	Past	Present	Future
1	-l-am	-∅-i	-b-o
2I	-l-i	-∅-(i)s	-b-i
2N	-l-e	-∅-o	-b-e
3N	-l-o	-∅-e	-b-e
2/3H	-l-en	-∅-(e)n	-b-en

a replacive insertion algorithm. Müller (2007) proposes a mechanism of enrichment, parallel to impoverishment to account for similar facts in German, Archi, and Timucua. Given these proposals, the presence of this kind of multiple exponence is not a knock-down argument in favour of an additive insertion aglorithm. Crucially, however, these approaches were developed to account for local cases of multiple exponence, where the same feature is exponed by two local affixes. Without significant complication, they cannot account for the long-distance portmanteau of Neg and Prf in Bengali, which an additive insertion algorithm can readily predict.[14] So if an additive insertion algorithm is independently required, we predict inward sensitivity of this sort to be possible, and have no need to posit particular labelling mechanisms or new morphological operations to account for them: contextual allomorphy rules are sufficient.

Thus we find that additive insertion algorithm proposed allows for existence of inward-sensitive morphosyntactically conditioned allomorphy, which aside from Bengali negative allomorphy and may also be at play in a variety of agreement and concord processes cross-linguistically.

5.2 Locality of allomorphy

A theory of contextual allomorphy must naturally describe whether there are any limits on the distance between the target of allomorphy and the trigger. Within the DM framework, proposed locality restrictions include: string adjacency (Siegel, 1978; Arregi and Nevins, 2012; Ostrove, 2018), structural adjacency Embick (2010), containment within the same minimal non-zero-level projection (Bobaljik and Harley, 2017),[15] and containment within the same accessibility domain Moskal (2015). In this section we shall see that the Bengali negative allomorphy facts strongly suggest that the last view must be correct.

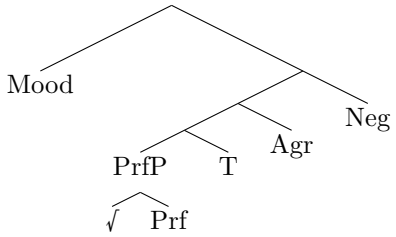
[14]The labelling approach is simply incapable of modelling the Bengali negative allomorphy, since it relies on the label of the sister of a head conditioning its insertion, and is inherently limited to adjacent nodes. The enrichment approach in principle might be able to produce the desired result, but would require a contextual enrichment rule, in essence doubling the perfect feature onto the non-local Neg before replacive insertion of Perf occurs. But if this is possible, then any node can be enriched by any other non-local node prior to vocabulary insertion, making an additive insertion algorithm indistinguishable from a replacive one.

[15]A head is a zero-level projection, and so being contained within the same minimal X' or XP if there are no bar levels is what this condition means.

This makes predictions for a class of constructions involving verbal compounds, which are shown to be borne out.

First, recall that the analysis proposed for the Bengali facts involves Perf being sensitive to morphosyntactic features of Neg and Mood. The assumed spine is repeated here for ease of exposition.

(44)

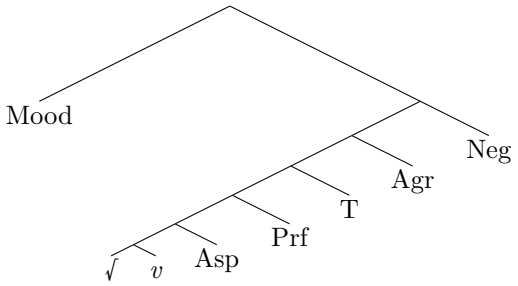


Let us consider each of the proposed locality restrictions in turn. Under the assumption that linearisation precedes vocabulary insertion, we find Mood-V-Prf-Agr-Neg as the linearised sequence of heads after impoverishment has eliminated the contents of T in realis clauses. Clearly, linear adjacency will not be sufficient to allow for contextual suppletion of Prf sensitive to Neg and Mood. Since the structure was inferred from linear order on the basis of the Mirror Principle, structural adjacency faces the exact same issue. At least Agr structurally intervenes between the target and triggers of contextual allomorphy. Containment within the same minimal non-zero-level projection is also clearly not satisfied, since Prf is contained within the maximal projection PrfP, which does not contain Neg or Mood. Thus the first three conditions are too strict to allow for the contextual allomorphy required.

Moskal (2015) observes that most of the preceding literature on locality restrictions on allomorphy has investigated root suppletion by affixes. Based on a survey of 196 languages in Veselinova (2006), she concludes that while root suppletion does indeed have strict locality restrictions as proposed in preceding work, affixal suppletion appears to be more free. This view proposes that a notion of accessibility domain is necessary to account for locality restriction. The accessibility domains extends from a target as far as one head beyond the nearest category-defining head.[16] This view crucially assumes acategorial roots, with v acting as a verbalizer, distinct from Voice. See Harley (2017) for a discussion of this view and motivations for separating the verbalizing v head from the argument introducing Voice head. Following Moskal's analysis, the spine is Bengali must be slightly expanded, as follows:

[16]This is due to a version of the Phase Impenetrability Condition and the assumption that categorizing heads are phasal.

(45)



Thus the accessibility domain of √includes Asp, but nothing further, since Asp is one head beyond the nearest category defining head, *v*. This comports with the observation by Veselinova (2006) that Bengali verbal suppletion is only for perfective vs. imperfective aspect, despite the contrast never being overtly exponed.[17] However, the accessibility domain for Prf includes all the heads above it, since there are no further categorizing heads in the structure. This predicts that suppletion of Prf for Neg or vice versa should be possible if accesibility domains are the right notion of locality for contextual allomorphy.

Thus, the negative allomorphy facts from Bengali support the view developed by Moskal (2015) which implicates categorizing heads in determining the distance at which contextual allomorphy may occur.

5.3 Timing of ellipsis

Recall that while using *ni* with perfects was otherwise obligatory, when ellipsis occurred, *na* was the only negation that could be stranded outside the ellipsis site. Given that the choice of negation was analysed as allomorphic, this meant that ellipsis needed to be able to bleed contextual allomorphy. As such, section 4.3 argued that PF deletion ellipsis in Bengali must be modelled as an impoverishment operation in order to destroy the contexts for non-default vocabulary insertion rules.

The conclusion that the silencing of elided terminals happens at the earliest stages of the post-syntax follows from the Segregated Transfer analysis of ellipsis developped by Aelbrecht (2010), where ellipsis results in non-insertion of vocabulary items. This also comports with recent work on the derivational timing of ellipsis in a variety of languages. In particular, Sailor (forthcoming) and Weisser (2019) both present arguments that ellipsis must block vocabulary insertion, just as has been argued in this paper. Sailor (forthcoming) demonstrates that morphophonological processes that are still sensitive to syntactic structure can be bled by ellipsis. Under the assumption that syntactic structure is visible to PF only before vocabulary insertion occurs (Embick and Noyer, 2001; Adger et al., 2003, among others), a processes making reference to both morphophonology and syntactic structure must take place at insertion. Thus if ellipsis is able to bleed it, it must occur before insertion. The two case studies considered are

[17] In fact, the only non-copular verb to supplete is 'go'. In the imperfective, the root is jA, and in the perfective it is gE, where A/E depend on harmony due to the following suffixes.

initial gemination in Verbicarese (a Calabrian dialect of regional Italian), and tone sandhi in Taiwanese. Initial gemination in Verbicarese is triggered by certain vocabulary items on linearly adjacent items if they are within the same minimal cycle, which Sailor takes to be the CP. Yet eliding a constituent allows gemination to skip over it, as if it were not there, suggesting it simply was not inserted, and hence the next pronounced element undergoes contextual gemination as a result of the inserted trigger. Tone sandhi in Taiwanese occurs on XP-final elements, and elided material behaves invisibly for this process, once again suggesting that it was simply never inserted to begin with. Weisser (2019) considers purported complementizer agreement in Bavarian, and demonstrates based on data from Fuß (2014) that it is in fact suppletion of C based on the phi features acquired by T under agreement. This is bled by right node raising of TPs, which Hartmann (2001) argues is PF deletion, akin to ellipsis. Thus, Bavarian provides another example of ellipsis bleeding contextual allomorphy, similar to the Bengali case considered above. Given these analyses, the proposal to model ellipsis as impoverishment in Bengali appears to be supported by cross-linguistic data.

However, it is worth noting that evidence exists which may be taken to suggest a different order of operations. Bennett et al. (2019) investigate the interaction between verum focus and responsive ellipsis in Irish and demonstrate that verum stress placement is able to bleed ellipsis in Irish. In particular, verum focus in Irish is realised as stress on pronominal subjects, when available, as shown in (46).

(46) A: Send it down!

B: Ní rachaidh SÉ síos!
B: NEG.FIN go.FUT 3M down

It won't GO down! (Bennett et al., 2019, 17)

Responsive ellipsis, which is the standard way to answer yes/no questions in Irish, is analysed by Bennett et al. (2019) as involving head movement of the verb up to polarity, followed by TP ellipsis, which obligatorily deletes the subject. This is shown in (47).

(47) An bhfuil sé breoite? Tá (*sé)
Q be.PRES 3M ill? be.PRES (*3M)
Is he ill? Yes. (Lit. "Is") (Bennett et al., 2019, 29)

However, verum stress placement on a pronominal subject can bleed its deletion in responsive ellipsis cases, as shonw in (48).

(48) An raibh sí ag scríobh litreacha? Bhí SÍ!
Q be.PST 3F P write letters? be.PST 3F!
Was she writing letters? Yes (indeed)!
(Bennett et al., 2019, 29)

The analysis that Bennett et al. (2019) provide for this case involves prosodification and verum stress placement preceding ellipsis, which they model in the phonology in an optimality theoretic (Prince and Smolensky, 2004) framework. This appears to suggest that ellipsis occur later than proposed in this paper. However, nothing in their analysis strictly requires vocabulary insertion to have already occured before prosodification does. If prosodic information exists before vocabulary insertion, then ordering ellipsis between prosodification and vocabulary insertion can simultaneously account for the facts from Irish and Bengali (and Verbicarese, Taiwanese, and Bavarian). The idea that prosodic information exists early has independent support from Richards (2016) and Bjorkman (2019). Richards's Contiguity Theory develops a model where prosodic activity at boundaries can trigger movement, and hence is present in narrow syntax. Bjorkman (2019) argues that prosodification must precede vocabulary insertion in Ingush and Breton, because verbs that undergo doubling for prosodic reasons can show two different allomorphs in the two positions in which it appears. Thus the apparent conflict between Irish ellipsis following prosodification and Bengali ellipsis preceding vocabulary insertion can be reconciled in a model where prosodifcation precedes vocabulary insertion. Examining the ramifications of such a model of language is left for future work.

6 Conclusion

This paper investigated the distribution of the Bengali non-copular clausal negation forms *na* and *ni*. The normal distribution of these two forms requires *ni* with verbs interpreted as perfects, and *na* everywhere else. However, it was shown that in irrealis clauses and with elliptical constructions, *na* was used even with a perfect verb. In investigating this distribution, it was first motivated that the *ni* constructions are true perfects, that negation regardless of its realisation and surface position has the same syntactic status and scope properties, and that the ellipsis site contains the actual structure of a perfect. On this basis, it was argued that *ni* is best analysed as an allomorph of *na* in the context of a silent perfect. A Distributed Morphology account of the alternation was presented, involving long-distance inward-sensitive morphosyntactically conditioned allomorphy. Given this analysis, it was argued that ellipsis must be modelled as deletion at the earliest stages of the post-syntax, namely as an impoverishment operation that bleeds vocabulary insertion. This proposal crucially makes use of an additive rather than replacive vocabulary insertion algorithm and long distance contextual allomorphy, as well as predicting that ellipsis should be modelled as deletion at the earliest stages of the post-syntax. Investigating the ramifications of these choices, especially as they pertain to cross-linguistic rule orderings involving ellipsis and morphophonology is left for future work.

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