The Syntax and Semantics of Tense and Aspect in Bangla

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1. Introduction

Incorporating the semantics of tense and aspect in syntax is often considered as a challenge in the domain of structural linguistics. In its current form, both tense and aspect are discussed within the scope of tense phrase (= TP) in syntax under the assumption that they do contribute in construing the traditional notion of compound time. While grammatical aspect has been found to be significant to the realm of syntax in some studies, lexical aspect is considered to be an inherent lexical or semantic property of the verb. In contrast to this classical position, the present discussion pursue a recent belief that the internal constituencies of compound time presupposes more structural issues than it was once believed to have. More importantly, a mere syntactic study isn’t sufficient to deal with the complex notion of time. Additionally, these complexities are multiplied with the structural peculiarities of non-English languages. Under this situation, the current discussion will present its view on how to incorporate the semantics of tense and aspect within the existing framework of transformational-generative syntax with a special emphasis on Bangla.

ABSTRACT

Incorporating the semantics of tense and aspect in syntax is often considered as a challenge in the domain of structural linguistics. In its current form, both tense and aspect are discussed within the scope of tense phrase (= TP) in syntax under the assumption that they do contribute in construing the traditional notion of compound time. While grammatical aspect has been found to be significant to the realm of syntax in some studies, lexical aspect is considered to be an inherent lexical or semantic property of the verb. In contrast to this classical position, the present discussion pursue a recent belief that the internal constituencies of compound time presupposes more structural issues than it was once believed to have. More importantly, a mere syntactic study isn’t sufficient to deal with the complex notion of time. Additionally, these complexities are multiplied with the structural peculiarities of non-English languages. Under this situation, the current discussion will present its view on how to incorporate the semantics of tense and aspect within the existing framework of transformational-generative syntax with a special emphasis on Bangla.
order. In this paper, a proposal is made as an effort to answer this question. As per the proposal, in between tense phrase (= TP) and verb phrase (= VP), two distinct layers of representation – namely, grammatical aspect phrase (= GrAspP) and lexical aspect phrase (= LexAspP) – are inserted while leaving the verb phrase internal adjunct position open for the temporal adverbs. The characteristic interactions – holding between grammatical aspect, lexical aspect and temporal adverbs – are then taken care of through successive copying and deletion of the verb in the various head-positions within the structural hierarchy of syntax. However, providing just the syntactic framework would render the study incomplete as a complete comprehension would require a proper semantic explanation as well. Hence a formal semantic interpretation corresponding to the proposed syntactic structure using predicate logic has been provided in the final section of the paper.

2. Research Objective

In the light of the general outline given above, a need arises to explain how the semantic characteristics of verb like aspect, tense etc. interact with each other within the general scope of syntax. Within its limited scope, this paper seeks explanation for the following questions: How the aspectual specifications namely lexical and grammatical are realized in the syntactic structure? Furthermore, a formal semantic interpretation of the syntactic structure with integrated aspectual specifications has been attempted in this paper. Bengali will remain within the focus language in this study.

3. Theoretical Background

The following theoretical models have been subscribed to in this study: The traditional Reichenbachian (1947) framework of relative tenses has been attested to in this paper to define the system of Bangla tense and aspect. According to his theory, tense can be defined in terms of the relation holding between speech time (S) and reference time (R), while information about grammatical aspect can be encoded by the relation between reference time (R) and event time (E). To represent the information of the situation type, Vendler’s (1957) four tier classification of situation types- State, Activity, Achievement and Accomplishment is subscribed.

By the semantic interaction of tense and aspect the above mentioned two theoretical aspects are presupposed along with a third factor of adverbialex modifiers – which are central in constraining the situation construal expressed by a sentence. By syntactic structure, Belletti’s following model (1990) has been referred to:

What is lacking in (1) is the provisions for tense and aspect (both grammatical as well as lexical).
Instead of dealing with these concepts separately, a theoretical position prefers to remain silent on the issues of a much richer proposition having enough scope to contain much structured information. In this effort, the morpho-syntax of Bengali verb plays a crucial role. In fact we would like to put forward the claim that the way in which information about tense and aspect is structured in Bengali verb morphology, can provide some intimation about how tense and aspect can be dealt with. The morpho-syntax of verb morphology has the following pattern:

2. V-aspect-tensei-personi

According to Chatterjee (1939), there are twelve tenses in Bangla: simple, progressive, perfect and habitual. What sets Bengali tenses apart is the clearly demarcated aspect markers. Simple tenses show an absence of aspect marker; ‘ṭih’ in progressive tenses and ‘etṭh’ in perfect tenses serve as the aspect markers respectively. Other than these, he lists three more tenses: past habitual, progressive habitual and perfective habitual. These, along with future progressive and perfect tenses behave more like complex predicates, the discussion of which is beyond the scope of this paper. The table given below lists the tenses using the root verb kor ‘to do’ followed by respective aspect, tense and person marker.

3. Simple Present 1st Person 2nd Person 3rd Person
i. Simple Present kor-ø-ø-i kor-ø-ø-o kor-ø-ø-e
ii. Simple Past kor-ø-1-am kor-ø-1-e kor-ø-1-o
iii. Simple Future kor-ø-b-o kor-ø-b-e
v. Past Progressive kor-ṭiḥ-il-am kor-ṭiḥ-il-e kor-ṭiḥ-il-o
vi. Future Progressive kor-ṭe øak-ø-b-o kor-ṭe øak-ø-b-e kor-ṭe øak-ø-b-e
viii. Past Perfect kor-ṭiḥ-il-am kor-ṭiḥ-il-e kor-ṭiḥ-il-o
ix. Future Perfect kor-e øak-ø-b-o kor-e øak-ø-b-e kor-e øak-ø-b-e
x. Past Habitual kor-ø-θ-am kor-ø-θ-e kor-ø-θ-o
xi. Progressive Habitual kor-ṭe øak-ø-θ-am kor-ṭe øak-ø-θ-e kor-ṭe øak-ø-θ-o
xii. Perfective Habitual kor-e øak-ø-θ-am kor-e øak-ø-θ-e kor-e øak-ø-θ-o

According to Chierchia and McConnell Ginet (2000), the semantics of tense morphemes modelled on IPC is as follows:

4. If ψ=Pφ, then \[\langle ψ\rangle_{P/Wm_i}^{M,w,i,g}=1,\] if there exists an \(i \in I\) such that \(i < i\) and \(\langle φ\rangle_{P/Wm_i}^{M,w,i,g}=1,\)
5. If ψ=Fφ, then \[\langle ψ\rangle_{P/Wm_i}^{M,w,i,g}=1,\] if there exists an \(i \in I\) such that \(i < i\) and \(\langle φ\rangle_{P/Wm_i}^{M,w,i,g}=1,\)

where P is the Past tense operator and F stands for Future tense operator. According to this model, a sentence of the form “It was the case that ψ” is true iff there is a moment that precedes the time of evaluation or speech time at which ψ is true. On a similar note, a sentence of the form “It will be the case that ψ” is true iff there is a moment that follows the time of evaluation or speech time at which ψ is true. This semantic model has been built upon in this paper to develop a semantic interpretation for the proposed model.

The scheme of representation of verbs in Bengali motivates Karmakar (2008) in imagining a layer intervening the direct interaction between the TP and VP as is proposed in (1). This layer is termed as aspect phrase and represented as AspP. It is this aspect phrase upon which we will build up our following discussion.
4. Data

5. \textit{ami} 15 minit-\textit{e} b\text{as stænd} pout\text{a}i
   I 15 minutes-in bus stand reach.PRES
   I reach the bus stand in 15 minutes. (Achievement)

6. *\textit{ami} 15 minit-\textit{e} kær\text{om} k\text{eli}
   I 15 minutes-in carom play.PRES
   I play carom in 15 minutes. (Activity)

7. \textit{ami} 15 minit-\textit{e} tfi\text{t\i}-\textit{ta} lik\text{\i}
   I 15 minutes-in letter-the write.PRES
   I write the letter in 15 minutes. (Accomplishment)

8. \textit{ami} 15 minit-\textit{e} boi-\textit{ta} tfai.
   I 15 minutes-in book-the want.PRES
   I want the book in 15 minutes. (State)

9. *\textit{ami} 15 minit-\text{o}ore b\text{as stænd} pout\text{a}i
   I 15 minutes-for bus stand reach.PRES
   I reach the bus stand for 15 minutes. (Achievement)

10. \textit{ami} 15 minute-\text{o}ore kær\text{om} k\text{eli}
    I 15 minutes-for carom play.PRES
    I play carom for 15 minutes. (Activity)

11. \textit{ami} 15 minute-\text{o}ore tfi\text{t\i}-\textit{ta} lik\text{\i}
    I 15 minutes-for letter-the write.PRES
    I write the letter for 15 minutes. (Accomplishment)

12. \textit{ami} 15 minute-\text{o}ore boi-\textit{ta} tfai.
    I 15 minutes-for book-the want.PRES
    I want the book for 15 minutes. (State)

13. *\textit{ami} t\text{o}otobæla-\text{o}eke b\text{as stænd} pout\text{a}i
    I childhood-since bus stand reach.PRES
    I reach the bus stand since childhood. (Achievement)

14. \textit{ami} t\text{o}otobæla-\text{o}eke kær\text{om} k\text{eli}
    I childhood-since carom play.PRES
    I play carom since childhood. (Activity)

15. *\textit{ami} t\text{o}otobæla-\text{o}eke tfi\text{t\i}-\textit{ta} lik\text{\i}
    I childhood-since letter-the write.PRES
    I write the letter since childhood. (Accomplishment)

16. \textit{ami} t\text{o}otobæla-\text{o}eke boi-\textit{ta} tfai.
    I childhood-since book-the want.PRES
    I want the book since childhood. (State)

17. \textit{ami} t\text{o}otobæla-\text{o}eke fom\text{o}-\text{e} b\text{as stænd} pout\text{a}i
    I childhood-since time-on bus stand reach.PRES
    I reach the bus stand on time since childhood.

In the sentences given above, /b\text{as stænd} pout\text{a}i/ ‘reach the bus stand’ is an achievement. In (5), it takes a terminative adverb ‘in 15 minutes’ to make a complete sense that I must have travelled to the bus stand for 15 minutes and reached it at a particular moment, that is, at the end of 15 minutes. In sentence (9), the durative adverb /15 minit-\text{o}ore/ ‘for 15 minutes’ renders the achievement sentence false. One cannot keep on reaching the bus stand for the entire duration of 15 minutes. In other words
achievement sentence can take a terminative adverb but not a durative one. On a similar note, this verb phrase ‘reach the bus stand’ cannot co-occur with /fotobela-θeke/ ‘since childhood’, which provides a lower boundary to the event as in (13). However if sentence (13) is modified as in (17), the adverb phrase /somxe-e/ ‘on time’ provides a habitual sense to the achievement sentence. The 2nd event /kærom kʰeli/ ‘play carrom’ is an activity. It fails to hold with a terminative adverb like ‘in 15 minutes’ in (6). Activity sentences are durative in nature and hence yields a meaningful sentence when used with /15 minit-θore/ ‘for 15 minutes’ in sentence (10). Similarly it can co-occur with durative adverb phrases marking lower boundary as in ‘since childhood’ in (14). In sentences (7), (11) and (15), /fiti-θi likʰi/ ‘write the letter’ is an accomplishment type event. It co-occurs with both adverbials ‘in 15 minutes’ as in (7) as well as ‘for 15 minutes’ in (11). However when we look at sentence (15), where ‘since childhood’ specifies the lower boundary, the sense of the sentence falters. A person cannot possibly keep on writing a particular letter since childhood. Sentences (8), (12) and (16) show the use of state type event /boi-θi tfail/ ‘want the book’. It co-occurs with all the three adverbs- ‘in 15 minutes’, ‘for 15 minutes’ as well as ‘since childhood’.

5. Discussion

The data discussed above shows, although not exhaustively, how mostly lexical aspect interact with various adverbial modifications. Similarly, lexical aspect, grammatical aspect and tense interact with each other as well as with other temporal adverbs. This justifies the need for explicitly including aspectual features within the traditional syntactic framework, hence our urge to put forward the proposal: The proposal which we want to put forward conceives AspP as the composition of grammatical aspect phrase (= GrAsP) and lexical aspect phrase (= LexAspP). LexAspP is embedded within the GrAspP and contains VP; whereas, GrAspP is contained by TP. A nearly approximate representation of this proposal can be found in (18):
The VP-Internal layer takes into account the entire argument structure (the subject which originates in the specifier position of the higher VP, the verb and the object which originates in the specifier of the lower VP along with its agreement features). It also contains the Lexical Aspect or the default Situation Type of the verb and the adjuncts which semantically modify the situation type at the sentence level. The VP-Internal Layer shows the interaction between the Lexical Aspect, adverbial phrase and the verb.

The VP-External Layer gives information about the Grammatical Aspect (in terms of boundedness and continuum or Perfectivity and Imperfectivity), which refers to the relation between RT and ET (the time span spent during the event). It is c-commanded by (T)ense which refers to the location of the event in time. It is further dominated by AgrSP, which refers to the subject-agreement features. The T c-commands the entire Aspectual categories; the GrAsp c-commands LexAsp which further c-commands AdvP and finally the Verb.

Given this type of theoretical proposition, now the task is to exemplify how (18) will work. (19) has been used below to exemplify the way (18) takes care of the semantic interactions within a single framework:

19. ɔnek dìn ɗore tf'ele-ti-Ø tfuri-Ø kor-et firstname.-Ø-e
many day post.position boy-cl-Nom steal-Acc do-perf-pres-3pres
The boy has stolen (something) for many days.

Following Belletti’s proposal, this could be represented as (20) with a toping of focus phrase to conform the derivation to the surface structure word order:

20. However, (20) is simply inadequate to capture the following details of (19): the grammatical aspect of the sentence is perfective and lexical aspect is accomplishment. The verb steal is an activity verb, but adverbial aspeceual phrase for many days along with the fact that the act of stealing is over, provides a
sense of accomplishment. Therefore, the scheme of (18) is preferred over (20) – which in turn will result into the following representation:

21.

However, developing an integrated syntactic framework doesn’t seem sufficient in dealing with temporality. A formal syntax-semantics interface needs to be developed for the above mentioned structure. That content is of equal importance to that of the structure when it comes to comprehension of sentences, is a well-established fact. In this section, an attempt has been made to provide a semantic interpretation for the integrated syntactic structure. Omitting the adverb phrase for simplifying the structure, the sentence now stands as follows:

22. ʧele-ti-Ø taka ʧuri-Ø kor-etʧ-Ø-e
    boy-cl-Nom money steal-Acc do-perf-pres-3_pres
    The boy has stolen money.

Tree diagrammatic representation of the above sentence (22) is as follows (here tree diagram has been simplified and only Grammatical Aspect has been taken into account by AspP)-s
For the convenience of the corresponding semantic representation of (23) as is mentioned in (24), let's assume \([\text{ele-ti}] = c\), \([\text{taka}] = k\), and \([\text{uri-kor-Ø-e}] = P\), where P is a two-place predicate. Additionally, a non-empty set of instances 'I' along with precedence 'i<=' and equivalence 'i=' relations will be required to represent the temporal and aspectual relations following the proposal of Reichenbach (1947).

24. a. \([\text{TP}] M, i, g = 1\) iff for some \(c \in D\), \([c] M, i, g(c/h) \in [\text{T' }] M, i, g(c/h)

b. \([\text{T' }] M, i, g(c/h) = 1\), iff there exist some \(i^*\) in I for which the following conditions hold
   i) \([\text{AspP}] M, i^*, g(c/h) = 1\), where
   ii) \(i^*=i\)

c. \([\text{AspP}] M, i^*, g(c/h) = 1\), iff \([t] M, i^*, g(c/h) \in [\text{Asp'}] M, i^*, g(c/h)

d. \([\text{Asp'}] M, i, g(c/h) = 1\), iff there exist some \(i\) in I for which following conditions hold
   i) \([\text{VP}] M, i, g(c/h) = 1\), where
   ii) \(i^*<i\)

e. \([\text{VP}] M, i^*, g(c/h) = 1\), iff \([t] M, i^*, g(c/h) \in [\text{V'}] M, i^*, g(c/h)

f. \([\text{V'}] M, i^*, g(c/h) = 1\), iff \((\[t] M, i^*, g(c/h), \[k] M, i^*, g(c/h)) \in [\text{P}] M, i^*, g(c/h)

g. \([c] M, i, g(c/h) = f(c) = [\text{ele-ti}]\)

h. \([t] M, i^*, g(c/h) = g(t) = [\text{taka}]\)

i. \([k] M, i^*, g(c/h) = f(k) = [\text{taka}]\)
(24)b(ii) expresses tense relation, present tense in this case, where \(i\) stands for speech time and \(i^*\) for reference time. Thus there is an instance \(i^*\) overlapping \(i\) when the sentence stands true. (24)d(ii) expresses grammatical aspect, perfective aspect in this case, where \(i'\) is the event time. Hence there is an instance \(i'\) preceding \(i^*\) when the sentence holds true. \(i^*\) places the time frame of the event at a time instance overlapping with \(I\), while \(i'\) places the time frame at a time preceding \(i^*\).

So long, the discussion has been limited to incorporating Grammatical Aspect in the semantic interpretation; the various grammatical aspects can be taken care of by modifying (24) at (24.d). Incorporating Lexical Aspect and adverbial phrase requires incorporation of finer grained functions like HoldsAt, Clipped, etc, which is beyond the scope of this paper.

6. Conclusions
The paper is primarily concerned with how semantic interactions of different granularity can be taken care of within the framework of transformational-generative grammar and how a formal semantic interpretation can provide a uniform model for the same. The notion of temporality is indeed a much researched arena; however little work has been done to integrate both syntactic and semantic aspects of time to develop an interface. A lot remains unexplored in this paper, leaving scope for a lot of further research.

References