Temporal Reference in Vietnamese[1]

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Abstract

The paper seeks to address gaps in current knowledge regarding cross-linguistic variation on the semantics of tense and aspect by investigating how temporal reference is determined in Vietnamese. In the first part of the study, I show that like St'át'imcets (Matthewson, 2006), Vietnamese is a 'superficially tenseless' language in the sense that even though the grammar lacks overt tense morphology, every finite clause possesses a phonologically empty non-future tense morpheme. In particular, I provide a formal analysis of the temporal marker *đã*, which is often argued to be a past tense marker in Vietnamese. By examining the distribution and interpretation of this marker, I argue that *đã* is neither a referential or quantificational past tense, but a perfect marker. The discussion relates directly to recent approaches to English and German (Pancheva & von Stechow, 2004), and thus it offers data from Vietnamese to the discussion on semantic variation on 'perfect puzzle' across languages. In the second part of the paper, I argue that future in Vietnamese realized as a combination both the obligatory null tense morpheme and an overt spell-out of *sẽ*, which is the Vietnamese counterpart of the English WOLL operator (Abusch, 1985). This means that *sẽ* itself is neither a purely a tense or solely an epistemic modal. This line of analysis contrasts with other existing accounts of future time reference in Mandarin Chinese (Lin, 2012) and Hausa (Mucha, 2013), thereby contributing a defense of a tensed analysis to the debate about future discourse among tenseless languages. Consequently, this study concludes that future time reference is systematically different from present and past time interpretations, which is similar to previous claims made by Abusch (1997), Kratzer (1998), and many others.

1 Introduction

Tense, the grammatical category expressing the location in time of an action or a state, has been the center of a large body of literature focusing on temporal reference. Nevertheless, a number of recent studies have demonstrated that many languages, including

Kalaallisut (Bittner, 2005), Lillooet (Matthewson, 2006), Mandarin (Lin, 2006), Guarani (Tonhauser, 2011), and Hausa (Mucha, 2013), among others, appear to be tenseless. In other words, such languages do not have overt grammaticalized expressions that impose constraints on the temporal relation between the time of reference and the time of utterance. These studies have significantly contributed to the literature on temporal reference by presenting detailed theoretical analyses on different tenseless languages, determining how they are similar and how they may vary from one another.

The goal of this paper is to advance understanding of cross-linguistic variation on the semantics of tense and aspect by examining how temporal reference is determined in Vietnamese. In particular, the study will investigate both the distribution and interpretation of the bare verb predicates, the preverbal aspectual and modal particles *sẽ*, *đã*, and *đang*, as well as their interaction with one another. The study first explores the possibility of accounting for such markers as optional tenses, along the lines of Duffield's (1999, 2007) and Phan's (2013) analyses. By testing this hypothesis against empirical data, I argue against the claim that *sẽ* and *đã* are future and past tenses, respectively. Following Matthewson's (2006) analysis for Lillooet, I further argue that although Vietnamese lacks overt tense morphology, every finite clause in the language possesses a phonologically empty tense morpheme, which restricts the reference time to being non-future. I then propose that *đang* is a progressive aspect, while *đã* is a perfect marker. Furthermore, futurity in Vietnamese is expressed with the combination of the null tense with *sẽ*, which functions as an overt spell-out of the WOLL operator (Abusch, 1985). Finally, based on their behaviors in conditionals, I provide evidence to show that even though *sẽ* (WOLL) and *đã* (PERF) cannot appear together on the surface, they do combine underlyingly in the semantics.

The structure of the paper is as follows. The next section introduces basic Vietnamese temporal data. In section 3, I present the analyses in previous literature. In Section 4, I address problems with these previous accounts and show how they do not work for a larger set of data in the language. Section 5 then contains the bulk of my analysis, and shows that it captures these facts. Afterwards, in section 6, I discuss a puzzle about future perfect constructions in Vietnamese, and propose an analysis that follows from the one put forth in Section 5. Finally, I summarize the key patterns, reemphasize the main points, and discuss their theoretical and typological import in the concluding section 7.

I conclude this introduction by outlining some very basic background assumptions and terminology. Following Reichenbach (1947) and adopting the terminology widely used in the literature, this paper assumes a three-way distinction among the utterance time (UT), the topic time or reference time (RT), and the situation time or event time (ET). These categories are defined as follows:

(1)   a. UT: The time at which the sentence is uttered

       b. RT: The time about which the claim is made

       c. ET: The time for which the predicate holds of the subject

Furthermore, following Klein (1994), this paper assumes tense provides information about the location of the RT and its relation to the UT:

(2)   a. Past Tense: The RT precedes the UT ($RT < UT$)

       b. Present Tense: The RT surrounds the UT ($UT \subseteq RT$)

       c. Future Tense: The RT follows the UT ($UT < RT$)

English verbs are marked with tense information, as illustrated below:

(3)   a. At the time of the war, Rey **was** in Jakku.

       b. At the time of the war, Rey **is** in Jakku.

       c. At the time of the war, Rey **will be** in Jakku.

The RT of all the cases in (3) is the time of the war. In (3a), past tense indicates this RT precedes the UT, while in (3b) and (3c), present and future tenses indicate that it surrounds and follows the UT, respectively. Therefore, it changes the time of the war. While the time of the war is in the past in (3a), it is in the present in (3b), and in the future in (3c). Meanwhile, aspect morphology contributes information regarding the relationship between the ET and the RT:

(4)   a. Imperfective Aspect: The ET surrounds the RT ($RT \subseteq ET$)

       b. Perfective Aspect: The RT surrounds the ET ($ET \subseteq RT$)

Moreover, English verbs are marked with aspect information:

(5)   a. When Leia was in the kitchen, Han **was making** a sandwich.

       b. When Leia was in the kitchen, Han **made** a sandwich.

Both of the sentences in (5) are in the past tense, indicating that the RT, which is the time of Leia being in the kitchen, precedes the UT. In (5a), imperfective aspect places Leia's being in the kitchen inside the sandwich-making. Intuitively, (5a) then requires the sandwich-making to have begun before and finish after Leia was in the kitchen. On the other hand, in (5b), the inclusion relation between the ET and the RT is reversed, as the perfective aspect places the sandwich-making inside Leia's being in the kitchen.

2   Vietnamese Temporal Data

2.1   Bare Verb Predicates

Unlike English, verbs in Vietnamese are not overtly marked with tense information. In other words, there are no obligatory grammaticalized expressions that impose constraints on the temporal relation between the RT and the UT in the language. When uttered out of the blue, bare verb sentences are only compatible with past time adverbials like *Hôm qua* 'yesterday' in (6a), present time adverbials like *bây giờ* 'now' in (6b), but not with future time adverbials like *năm sau* 'next year' in (6c)[2]:

(6)   a.   Hôm qua Darth Vader xây   Ngôi Sao Chết.
           yesterday Darth Vader build CL   star death
           'Darth Vader built the Death Star yesterday.'

      b.   Bây giờ Darth Vader xây   Ngôi Sao Chết.
           now   Darth Vader build CL   star death
           'Darth Vader builds the Death Star now.'

      c.   #Năm sau   Darth Vader xây   Ngôi Sao Chết.
            year after Darth Vader build CL   star death
            (*Int.:* 'Darth Vader will build the Death Star next year.')

Similarly, a clause containing the bare verb *xây* 'build' is felicitously uttered as an answer to the question in (7a) about a past activity, or as an answer to the question in (7b) about a present activity, but crucially, not as an answer to the question in (7c) about a future activity:

(7)   a.   Hôm qua DV làm gì?   b.   DV xây   Ngôi Sao Chết.
           yesterday DV do   what   DV build CL   star death
           'Where did DV do yesterday?'   'DV built the Death Star.'

(8)   a.   Bây giờ DV làm gì?   b.   DV xây   Ngôi Sao Chết.
           now   DV do   what   DV build CL   star death
           'What does DV do now?'   'DV builds the Death Star.'

(9)   a.   Năm sau   DV **sẽ** làm gì?   b.   #DV xây   Ngôi Sao Chết.
           year after DV SE do   what   DV build CL   star death
           'What will DV do next year?'   (*Int.:* 'DV will build the DS.')

One might wonder whether (9b) is unacceptable because Vietnamese requires the temporal particle that appears in the question to also appear in the answer. In this

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[2]As detailed later, (6b) has a habitual viewpoint aspect, as it denotes that Darth Vader has the duties of being the builder of the Death Star now. However, (6a) can be either habitual or perfective.

case, (9b) is bad merely because it lacks the preverbal particle *sẽ* that is uttered in the question in (9a). However, this hypothesis does not seem to be plausible, as there are cases in the language in which the answer is still acceptable without having the preverbal particle from the question repeated, as illustrated below:

(10) a. Hôm qua DV **đã** làm gì?   b. DV xây   Ngôi Sao Chết.
         yesterday DV DA do   what   DV build CL   star death
         'What did DV do yesterday?'   'DV built the Death Star.'

While the preverbal particle *đã* is included in the question in (10a), it is not in the answer in (10b). In this case, *sẽ* and *đã* behave differently as preverbal particles in the language. Nevertheless, both *sẽ* and *đã* appear to be related to tense and aspect markers, and thus they seem to play a role in determining temporal reference in Vietnamese. Therefore, one of the goals of this paper is to investigate the interpretation and distribution of these preverbal particles in Vietnamese.

2.2   Preverbal Particles

As shown in (6c) and (9b) above, bare verb sentences in Vietnamese cannot be used to describe future eventualities. Such eventualities can only be described when the preverbal particle *sẽ* appears in the sentence, as illustrated below:

(11) a. Năm sau   DV **sẽ** làm gì?   b. DV **sẽ** xây   Ngôi Sao Chết.
         year after DV SE do   what   DV SE build CL   star death
         'What will DV do next year?'   'DV will build the Death Star.'

Furthermore, as shown in (6a-b), (7), and (8), a bare verb predicate can get either a past or a present interpretation. However, as shown in (10a) above, as well as (12) and (13) below, the presence of the preverbal particle *đã* also gives rise to a past reading. As shown in (13), a clause containing *đã* is not true in situations in which the eventuality or habit is currently ongoing:

SITUATION: DV built the DS last year.   SITUATION: DV builds the DS right now.

(12) DV **đã** xây   Ngôi Sao Chết.   (13) #DV **đã** xây   Ngôi Sao Chết.
       DV DA build CL   star death   DV DA build CL   star death
       'Darth Vader built the Death Star.'   'Darth Vader built the Death Star.'

Furthermore, Vietnamese verbs can be marked for aspect. In particular, clauses containing the preverbal particle *đang* are compatible with progressive aspectual reference, where the ET properly contains the RT:

SITUATION: Han began making his at 2 PM. At 2:10, Leia went into the kitchen to get a knife. At 2:15, Leia walked out of the kitchen with her knife, and Han was still in the middle of making his sandwich.

(14) Lúc Leia ở   trong bếp,   Han **đang** làm bánh mì.
      When Leia locate in   kitchen Han PROG make sandwich
      'When Leia was in the kitchen, Han was making a sandwich.'

As shown in (14), *đang* places the time of Leia being in the kitchen inside the time of Han making a sandwich. This sentence is then consistent with the sandwich-making still continuing at present, and thus it is true for the given situation. On the other hand, when the verbs are not marked with any overt aspectual marking, the viewpoint aspect can be interpreted as perfective, as illustrated below:

SITUATION: Leia was in the kichen from 2 PM to 3 PM. At 2:10, Han walked into the kitchen to make a sandwich. At 2:15, he walked out of the kitchen with his freshly made sandwich.

(15) Lúc Leia ở   trong bếp,   Han làm bánh mì.
      When Leia locate in   kitchen Han make sandwich
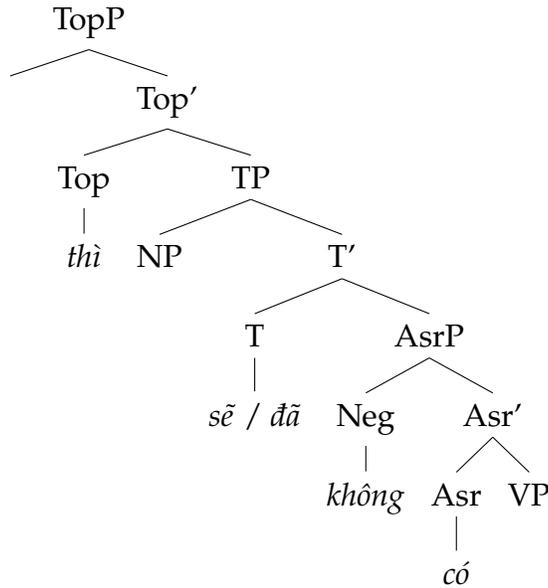   'When Leia was in the kitchen, Han made a sandwich.'

While the sentence in (14) is not acceptable in the situation described in (15), the sentence in (15) is not good in the scenario in (14). Compared to (14), (15) has the reversed inclusion between the ET and the RT. In this case, it is the time of the sandwich-making that is placed inside the time of Leia being in the kitchen. Moreover, contrary to the behavior of the clause containing *đang* in (14), the clause in (15) with no marking entails that the sandwich-making does not continue into the present. As a result, (15) is true for the given situation. The next section will then explore the hypotheses proposed in previous literature to account for the behaviors of these preverbal particles.

3 Previous Literature

3.1 Duffield (1999, 2007)

One of the first works to analyze the system of preverbal particles in Vietnamese is that of Duffied (1999, 2007). This work claims that Vietnamese expresses assertion independently of tense or aspect. As a result, Duffield proposes that there are three functional categories above Verb Phrase (VP) in Vietnamese, which are Topic Phrase (TopP), Tense Phrase (TP), and Assertion Phrase (AsrP). Furthermore, while he does not focus on the semantics of tense and aspect in Vietnamese, he does propose that *sẽ* and *đã* are future and past tenses, respectively. He further argues that tense marking in Vietnamese is

"almost always" optional, which contrasts with the obligatory presence of tense morphology in English. As a result, Duffield suggests that the tense morphemes *sẽ* and *đã* occupy the Tense node, with lexical verbs remaining in the Verb Phrase (VP). This claim is based on the fixed position of *sẽ* and *đã* in matrix clauses, as they both directly follow the subject and precede the sentential negation *khong*, as illustrated below:

(16)

```
                    TopP
                   /  
                 Top'
                /    \
             Top      TP
              |      /  \
             thì   NP    T'
                        /  \
                       T    AsrP
                       |    /   \
                   sẽ / đã Neg   Asr'
                           |     /  \
                        không  Asr  VP
                                |
                               có
```

Under this view, then, *sẽ* is proposed to be a future tense. Thus, under a neo-Reichenbachian framework, *sẽ* restricts the RT to be temporally located after the UT.

Secondly, since *đã* is argued to be a past tense morpheme in this account, *đã* imposes a precedence relation between the RT and the UT. This explains why *đã* appears to play a role in excluding the present time reference from the matrix clauses in (13). Moreover, since *đã* restricts the RT to be in the past of the UT, the clauses containing *đã* are compatible with past time adverbials like *Hôm qua* 'yesterday', as in (10), and are true in situation denoting a past time eventuality, as in (12).
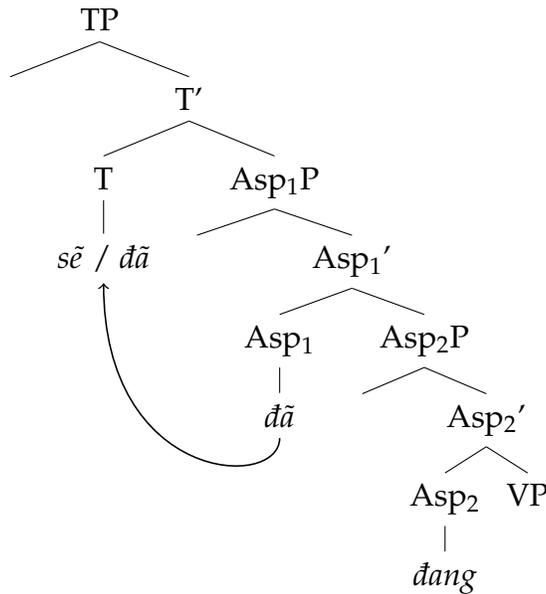
Furthermore, since *sẽ* and *đã* are put under the same Tense node, they are always in complementary distribution. The proposed syntax correctly predicts that *sẽ* and *đã* cannot co-occur, even in future perfect constructions like the following case:

(17)   *Han **sẽ đã** làm   bánh mì.
        Han SE DA make sandwich
       (*Int.*: 'Han will have made a sandwich.')

3.2   Phan (2013)

Besides Duffield (1999, 2007), Phan (2013) also focuses on how the preverbal particles *sẽ*, *đã*, and *đang* determine temporal reference in Vietnamese. She claims that based on

its syntactic and semantic behaviors, *sẽ* in Vietnamese is essentially temporal, and that it is a preverbal element that is a direct manifestation of TP. While *sẽ* is a true tense for always designating futurity, *đã* is a composition of both a past tense and a pluperfect aspect. Meanwhile, *đang* is purely an aspectual marker, and it behaves like a progressive aspect. While Phan does not propose a formal semantics for these particles, she does argue for a syntactic structure in which *sẽ* and *đã* are base-generated in different positions. In particular, while *sẽ* is underlyingly the head of Tense, *đã* is underlyingly merged lower as the head of Aspect (Asp). Meanwhile, *đang* takes the lowest Aspect head in the structure, as illustrated below:

(18)

```
              TP
            /    \
                  T'
                /    \
              T       Asp₁P
              |      /    \
          sẽ / đã         Asp₁'
                        /      \
                    Asp₁       Asp₂P
                     |        /     \
                    đã            Asp₂'
                               /     \
                            Asp₂     VP
                             |
                            đang
```

Although *đã* is base-generated in Asp₁, it must further move to T to check its inherent tense feature in addition to its aspectual feature. This movement is obligatory because it is feature driven.

The major difference between Phan's (2013) and Duffield's (1999, 2007) analyses is that Phan treats *đã* as a pluperfect, or past perfect, in addition to it being a past tense. This account, then, predicts that *đã* would put one event further into the past than another past event. This prediction appears to be correct, as it seems to account for the contrast shown in (19) and (20) below. In particular, in the given situation, only (19), a clause that contains *đã*, is true:

SITUATION: Leia walks into the kitchen, and she finds Han standing next to a freshly made sandwich.

(19) Leia đi   vào bếp.   Han **đã** làm   bánh mì.
      Leia walk into kitchen Han DA make sandwich.
      'Leia walked into the kitchen. Han had made a sandwich.'

(20) #Leia đi   vào bếp.   Han làm   bánh mì.
      Leia walk into kitchen Han make sandwich.
      'Leia walked into the kitchen. Han made a sandwich.'

Under a neo-Reichenbachian framework, and the assumption that *đã* can be interpreted as a pluperfect and its absence cannot, the relation among the ET, the RT, and the UT of (19) and (20) will be as follows:

(21)   a. (19): ET < RT < UT
       b. (20): ET, RT < UT

In both (19) and (20), the first sentence, *Leia đi vao bep* 'Leia walked into the kitchen,' sets up the RT for the second sentence. Then, in (20), the second sentence with a bare verb predicate requires the time of Han making a sandwich to take place at or after the time of Leia walking into the kitchen. Therefore, (20) is false for the given situation. On the other hand, the presence of *đã* in (19) puts the sandwich-making before Leia's walking into the kitchen, and thus (19) is true in the given situation. As a result, *đã* does require the second sentence to be interpreted within the past of the RT, which is the event of the first sentence.

Finally, as shown in the syntax in (18), *đang* occupies the lowest Aspect head, while *sẽ* and *đã* take higher positions in the structure. This syntax correctly predicts that while *sẽ* and *đã* cannot co-occur, they can freely combine with the progressive aspect *đang*. In this case, the semantics proposed predicts that a clause containing *sẽ đang* would get a future progressive reading, as shown in (22):

(22)   Darth Vader **sẽ đang** xây   Ngôi Sao Chết.
       Darth Vader SE PROG build CL   star death
       'Luke will be building the Death Star.'

According to Phan, *đã* functions as both a past tense and a pluperfect. Therefore, the combination of *đã* and *đang* are predicted to yield either a past progressive or a pluperfect progressive interpretation, as shown in (23):

(23)   Darth Vader **đã đang** xây   Ngôi Sao Chết.
       Darth Vader DA PROG build CL   star death
       'Luke was / had been building the Death Star.'

As presented in this section, the analyses proposed in Duffield (1999, 2007) and Phan (2013) provide reasonable explanations and correct predictions to certain facts for Vietnamese temporal data. In the next section, I will show how these accounts do not work for a larger set of data as well as how their claims on *sẽ* and *đã* being tenses in the language lead to wrong predictions.

4 Problems with the Previous Accounts

4.1 Non-future Interpretations

First, neither Duffield (1999, 2007) nor Phan (2013) proposes an analysis of bare verb predicates. Consequently, neither can account for the fact that a bare verb predicate can receive either a past or a present interpretation, as shown in (6), (7), and (8), but they can never be interpreted in the future, as shown in (9). While both Duffield and Phan argue for *sẽ* and *đã* being overt optional tenses in Vietnamese, their analyses do not explain for this contrast between non-future, which can be obtained with no overt tense marker, and future interpretations, which can only be obtained with an overt tense marker, in the language.

4.2 'Future in the Past' Interpretations

Secondly, if *sẽ* functions as a future tense that requires a predicate to be interpreted after the UT, then the fact that *sẽ* can also give rise to 'future in the past' readings cannot be accounted for. As illustrated below, besides the ordinary future readings in (24), which have been examined in previous literature, *sẽ* also gives rise to 'future in the past' readings in (25):

SITUATION: Rey is going to go to Jakku in a week.

(24) Tuần sau Rey **sẽ** đi Jakku.
week after Rey SE go Jakku
'Leia will go to Jakku next week.'

SITUATION: Rey was going to go to Jakku last week, but the trip was cancelled.

(25) Tuần trước Rey **sẽ** đi Jakku.
week before Rey SE go Jakku
'Rey was going to go to Jakku last week.'

Under a neo-Reichenbachian framework, (24) and (25) will have the following relations among the ET, the RT, and the UT:

(26) a. (24): UT < RT, ET
      b. (25): RT < UT & RT < ET

Both Duffield (1999, 2007) and Phan (2013) only predict the precedence relation between the UT and the RT in (24). However, since these previous accounts argue that *sẽ* is a future tense, which restricts the RT to be temporally located after the UT, they fail to account for the fact shown in cases like (25), where the relation between the RT and the UT is reversed.

4.3 Perfect Interpretations

Thirdly, while Duffield (1999, 2007) and Phan (2013) propose that *đã* does have a function of an optional past tense, I argue that this claim cannot account for the contrast in event arrangement between (19) and (20). As shown in (6), (7), and (8), a bare verb predicate can get a past reading. If *đã* is an optional tense that also gives rise to past interpretations, then (19), which contains *đã*, and (20), which contains bare verb predicate, should behave similarly to each other. In particular, both of these sentences are predicted to place the sandwich-making at or after Leia's walking into the kitchen.

However, the fact that *đã* instead puts Leia's walking into the kitchen after the sandwich-making in (19) suggests that *đã* is not a past tense. Moreover, the presence of *đã* is required, and not optional, when one event needs to be put further into the past than another. As a result, this falsifies Duffield's claim and part of Phan's proposal.

If *đã* is in fact a pluperfect aspect like Phan (2013) proposes, then *đã* can only appear in past perfect constructions. However, as illustrated in (27) below, *đã* does appear in future perfect constructions. The fact that a clause containing *đã* is true when uttered in such situations proves that *đã* is not merely a pluperfect aspect, and thus it falsifies Phan's proposal:

SITUATION: It is 12 PM right now, the time at which Han starts making his sandwich and Leia leaves her office to go to the kitchen. It takes Han 3 minutes to make a sandwich, and Leia 5 minutes to get to the kitchen.

(27) Lúc   Leia đi   vào bếp,   Han **đã** làm   bánh mì.
      when Leia walk into kitchen Han DA make sandwich.
      'By the time Leia walks into the kitchen, Han will have made a sandwich.'

Furthermore, up until now, the data has shown that future interpretations in Vietnamese can only be obtained when *sẽ* is overtly marked. This pattern has been illustrated in many different future-denoting situations and constructions, including questions and answers about future activities in (9) and (11), future progressives like (22), as well as ordinary future and 'future in the past' readings in (24) and (25), respectively. However, as shown in (27) above, *sẽ* does not appear in future perfect constructions. It is *đã* that appears in such cases. Then, contrary to the claims made about *sẽ* and *đã* in previous proposals, it seems that *đã* alone can also give rise to future interpretations.

As mentioned earlier, the syntax structures proposed in Duffield (1999, 2007), as illustrated in (16), and Phan (2013) correctly predicts that *sẽ* and *đã* cannot co-occur. Therefore, in (27), instead of having both *sẽ* and *đã* appear to express the future perfect meaning, we can only have one of the preverbal particles, which ends up being *đã* in this case. One might wonder whether the future perfect meaning in (29) can still be obtained with the morpheme *sẽ*, instead of *đã*. However, if it is *sẽ*, and not *đã*, that

appears, the sentence will no longer receive the future perfect interpretation, and thus it is no longer true for the given situation:

(28) #Lúc   Leia đi   vào bếp,   Han **sẽ** làm   bánh mì.
     when Leia walk into kitchen Han SE make sandwich.
     'When Leia walks into the kitchen, Han will make a sandwich.'

The only interpretation we can get in (28) is the ordinary future perfective reading. In this case, there is a contrast between the future perfective readings, which are obtained with *sẽ* alone, and the future perfect ones, which can be obtained with *đã* alone. This contrast in the relation the ET and the RT between (27) and (28) are illustrated below, using a neo-Reichenbachian framework:

(29)   a. (27): $UT < ET < RT$
       b. (28): $UT < ET, RT$

In other words, the sentence in (27) receives only the interpretation in (29a), while the one in (28) receives only the interpretation in (29b). Since Duffield (1999, 2007) and Phan (2013) do not take into account such contrast, their theories cannot account for the different semantics that these preverbal particles may have in future perfect interpretations.

4.4   Progressive Interpretations

Moreover, while both Duffield (1999, 2007) and Phan (2013) correctly predict that *đã* can freely combine with *đang*, they fail to capture all the readings that a clause containing *đã* and *đang* can get. In particular, both of the previous accounts predict that *đã đang* gives rise to past progressive readings, as they propose that *đã* is a past tense, and *đang* is a progressive aspect. However, such prediction is not correct, since the combination of these two preverbal particles does not yield past progressive readings. Such readings can be obtained with *đang* alone, as illustrated below:

SITUATION: Darth Vader was building the Death Starat 2:15 PM yesterday.

(30)   2:15 hôm qua, Darth Vader **đang** xây   Ngôi Sao Chết.
       2:15 yesterday Darth Vader PROG build CL   star death
       'Darth Vader was building the Death Star at 2:15 yesterday.'

In this case, without *đã*, the presence of *đang* alone in a temporally unmarked predicate is still sufficient to express a past progressive meaning. However, if *đã* appears next to *đang*, this interpretation goes away. Instead, a clause containing *đã đang* can receive one of the four other readings, which are present perfect progressives, pluperfect progressives, future perfect progressives, and 'future in the past' perfect progressives, as illustrated in (31) below:

(31) Darth Vader **đã đang** xây   Ngôi Sao Chết.
      Darth Vader DA PROG build CL   star death
      'Darth Vader have been / had been / will have been / would have been building
      the Death Star.'

In examples (32)-(35), I further show that clauses containing *đã đang* can express different meanings, and that they are true when uttered in different situations:

SITUATION: Darth Vader has been building the Death Star since last year.

(32) Darth Vader **đã đang** xây   Ngôi Sao Chết từ   năm ngoái.
      Darth Vader DA PROG build CL   star death since year previous
      'Darth Vader have been building the Death Star since last year.'

SITUATION: Darth Vader built the Death Star between 2014 and 2016. In 2015, he had been building it for a year.

(33) Năm 2015, Darth Vader **đã đang** xây   Ngôi Sao Chết được một năm.
      year 2015 Darth Vader DA PROG build CL   star death for   one year
      'In 2015, I had been building the Death Star for a year.'

SITUATION: Darth Vader has built the Death Star since February 2017. This time next year, he will have been building it for a year.

(34) Đến tháng Hai năm sau, DV **đã đang** xây   Ngôi Sao Chết được một năm.
      by   month two year after DV DA PROG build CL   star death for   one year
      'Darth Vader will have been building the Death Star for a year by next February.'

SITUATION: Darth Vader started building the Death Star in February 2017. It is now June 2017, and he just learned that he is building another station, but not the current Death Star project, next year.

(35) Đến tháng Hai năm sau, DV **đã đang** xây   Ngôi Sao Chết được một năm.
      by   month two year after DV DA PROG build CL   star death for   one year
      'DV would have been building the Death Star for a year by next February.'

As mentioned earlier in (24), Phan (2013) predicts that besides a past progressive reading, *đã đang* can also yield a pluperfect progressive interpretation. While she incorrectly predicts the past progressive reading, her prediction about the pluperfect progressive one is correct. However, her proposal still cannot account for the other three interpretations.

Likewise, even though Duffield (1999, 2007) and Phan (2013) correctly predict that *sẽ* can freely combine with *đang*, they fail to capture all the interpretations that a clause containing *sẽ đang* can get. In particular, both of the previous accounts suggest that the combination of *sẽ* and *đang* would yield an ordinary future progressive reading. However, as illustrated below, this is not the only interpretation that sentences like (36) can receive:

(36) Darth Vader **sẽ đang** xây Ngôi Sao Chết.
Darth Vader SE PROG build CL star death
'Darth Vader will be / would be building the Death Star.'

In this case, besides the predicted ordinary future progressive reading, a clause containing *sẽ đang* can also receive a 'future in the past' progressive reading, as further illustrated in the following situations:

SITUATION: It is February 2017. DV going to build the Death Star next season.

(37) Mùa   sau Darth Vader **sẽ đang** xây Ngôi Sao Chết.
season after Darth Vader SE PROG build CL star death
'Darth Vader will be building the Death Star next season.'

SITUATION: It is February 2017, and DV is telling you his life story. In December 2015, he learned that he was assigned to build the Death Star in Spring 2016.

(38) Mùa   sau Darth Vader **sẽ đang** xây Ngôi Sao Chết.
season after Darth Vader SE PROG build CL star death
'Darth Vader would be building the Death Star next season.'

Under the view of both Duffield (1999, 2007) and Phan (2013), *sẽ* is a future tense, and thus the combination of this morpheme with the progressive *đang* cannot get the desired 'future in the past' progressive reading for situations like (38) above.

4.5   Perfective Interpretations

Finally, the previous accounts neither discuss the perfective aspect nor propose formal semantics for viewpoint aspects. Therefore, neither Duffield's (1999, 2007) nor Phan's (2013) analysis addresses the contrast in the ability to cover both past and present RTs between the progressive aspect *đang* and the phonologically empty perfective aspect. In particular, a bare verb predicate with the null perfective viewpoint aspect is compatible with both a past-time sub-event and a present-time sub-event simultaneously, while a clause containing the progressive *đang* is not, as illustrated below:

SITUATION: Leia and Han are taking a cooking class, and they wanted to each make a sandwich. Leia was making hers an hour ago, but she stopped and never worked on it again. Han is currently in the middle of his.

(39) Leia và Han làm bánh mì.
Leia and Han make sandwich
'Leia and Han make / made sandwiches.'

(40) #Leia và Han **đang** làm bánh mì.
 Leia and Han PROG make sandwich
 'Leia and Han are / were making sandwiches.'

While (39) is true for the given situation, (40) is not. The possibility of (39) in the paired scenario shows that a bare predicate like *làm bánh mì* can be used in one-and-the-same sentence to apply to both a past even and present event. Curiously, the impossibility of (40) in this same scenario shows that adding the progressive particle *đang* defeats this possibility. This curious contrast, which our semantics will be able to explain, is not accounted for by Duffield (1990, 2007) or Phan (2013). In the next section, I will propose an analysis that can capture the facts presented so far.

5 Analysis

5.1 The Framework

Before introducing the analysis, I will outline the framework adopted, which is the pronominal approach to the semantics of tense provided in Kratzer (1998). In this framework, the Tense head, which is of type i, is proposed to be sister to the Aspect Phrase, which denotes a property of times. This AspP in turn takes the VP as complement. As a result, the whole TP denotes a proposition, as illustrated in (41) below:

(41)
$$\text{TP}\langle s, t\rangle$$

$$\text{T}\langle i\rangle \quad \text{AspP}\langle i, \langle s, t\rangle\rangle$$

$$\text{Asp} \quad \text{VP}$$
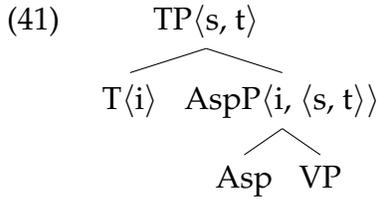
First, instead of projecting a temporal argument, verbs project an event argument. Then, the lexical entry for verbs like 'build' will be as follows:

(42) $[\![\text{ build }]\!]^{w, t, g, c} = [\ \lambda x_e : [\ \lambda y_e : [\ \lambda e_\varepsilon : \text{build}(e)(w) \ \& \ \text{Agent}(e)(w) = x$
             $\& \ \text{Theme}(e)(w) = y\ ]\ ]\ ]$
   'In world w, e is an event of building whose agent is x and whose theme is y.'

Secondly, Aspect heads are of type $\langle\langle \varepsilon, t\rangle, \langle i, t\rangle\rangle$. They take as argument a predicate of events, which is the denotation of the VP, and return a predicate of times, which then goes on to combine with the Tense head. Then, the lexical entry for the imperfective (IMPFV) aspect is given in (43) below:

(43) $[\![\text{ IMPFV }]\!]^{w, t, g, c} = [\ \lambda P_{\langle \varepsilon, t\rangle} : [\ \lambda t'_i : \exists e\ .\ t' \subseteq \tau(e) \ \& \ P(e) = T\ ]\ ]$
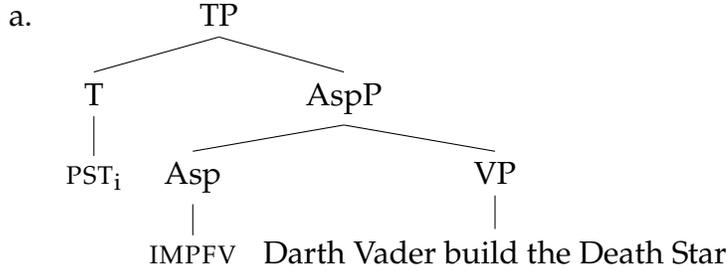   'The time t' is contained within the 'temporal trace' of an event of P.'

Finally, since i is the type of time interval, the tense morpheme itself introduces a variable over time intervals. The variable in T corresponds to the RT, and receives its value from the contextually determined assignment function. Following Heim (1994), the lexical entries of the tense morphemes then introduce presuppositions restricting the RT. Then, the lexical entry for the past (PST) tense morpheme is given as follows:

(44) $[\![$ PST$_i$ $]\!]^{w, t, g, c}$ is only defined if $g(i) < t_c$
If defined, then $[\![$ PAST$_i$ $]\!]^{w, t, g, c} = g(i)$
'The past tense morpheme is only defined if the context c provides a time interval $g(i)$ that precedes the UT.'

Then, the denotation of a simple sentence is as follows:

(45) Darth was building the Death Star.

a.

```
              TP
        ┌──────┴──────┐
        T           AspP
        │        ┌────┴────┐
       PST_i    Asp       VP
                 │          │
               IMPFV   Darth Vader build the Death Star
```

b. $[\![$ TP $]\!]^{w, t, g, c} = [$ $\lambda w :$ $[$ $\exists e :$ $[$ build(e)(w) & Agent(e)(w) = Darth Vader & Theme(e)(w) = the Death Star & $g(i) \subseteq \tau(e)$ $]$ $]$ $]$ (where $g(i) < t_c$)
'There is an event e of Darth Vader building the Death Star, whose running time τ includes the contextually salient past time $g(i)$.'

I will show that Vietnamese also employs this same functional structure of the clause. Moreover, similar to how the English PAST introduces a time interval that precedes the UT, the Tense head in Vietnamese also serves to narrow down possible RTs. As detailed later, the only difference is that the Vietnamese non-future tense morpheme is less restrictive than the English past tense morpheme, which was shown earlier in (44).

5.2 Tense and Viewpoint Aspects

First, as discussed earlier, bare verb sentences in Vietnamese can be used to describe past and present, but not future eventualities, as shown in (6), (7), and (8). Following Matthewson's (2006) analysis for Lillooet, I propose that such non-future temporal reference is contributed by a phonologically empty tense morpheme, NONFUT. In particular, all finite clauses in Vietnamese introduce a variable over time intervals, and the values for that variable are restricted to times that are not temporally located after the UT. Then, while the English past tense morpheme restricts possible values for the RT to being past, the Vietnamese non-future one restricts such values to being non-future, as illustrated below:

(46) ⟦ NONFUT$_i$ ⟧$^{w, t, g, c}$ is only defined if $\neg(t_c < g(i))$
      If defined, then ⟦ NONFUT$_i$ ⟧$^{w, t, g, c}$ = g(i)
      'The non-future tense morpheme is only defined if it is not the case that the context c provides a time interval g(i) that follows the UT.'

Secondly, as shown in (14) above, with the presence of *đang*, the ET, which is the time of Han making a sandwich, properly contains the RT, which is the time of Leia being in the kitchen. Then, Duffield's (1999, 2007) and Phan's (2013) analyses are correct, as they suggest that *đang* is a progressive aspect. Therefore, I propose the following semantics for the preverbal particle *đang*:

(47) ⟦ DANG ⟧$^{w, t, g, c}$ = [$\lambda P_{\langle \varepsilon, t \rangle}$: [$\lambda t'_i$: $\exists e$. $t' \subset \tau(e)$ & P(e) = T]]
      'The time t' is properly contained within the 'temporal trace' of an event of P.'

Under the semantics proposed in (46) and (47), the denotation of the sentence in (48) will then be calculated in (49):

(48) Darth Vader **đang** xây   Ngôi Sao Chết.
      Darth Vader PROG build CL   star death
      'Darth Vader is / was building the Death Star.'

(49) a.
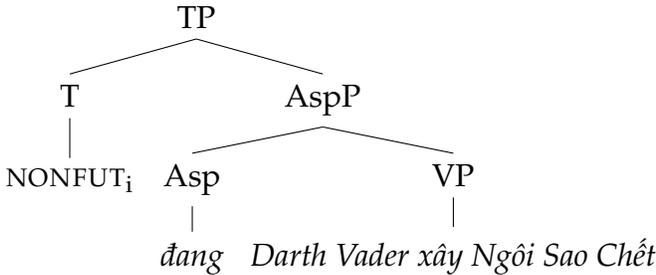
      b. ⟦ TP ⟧$^{w, t, g, c}$ = [λw : [$\exists e$: [build(e)(w) & Agent(e)(w) = Darth Vader & Theme(e)(w) = the Death Star & g(i) $\subset \tau(e)$]]] (where $\neg(t_c < g(i))$)
      'There is an event e of Darth Vader building the Death Star, whose running time τ properly includes the contextually salient non-future time g(i).'

This semantics shows that the combination of *đang* with a bare verb yields both present progressive and past progressive interpretations. As a result, not only does it capture the facts presented in (14) and (30), but it also correctly predicts the two readings sentences like (48) can receive.

While the progressive aspect is marked overtly with the preverbal particle *đang*, not all semantic aspectual distinctions receive overt morphological expression. In particular, as shown in (6) above, a sentence with no overt marking of viewpoint aspect can get either a habitual or a perfective reading. Then, the behavior of the Vietnamese viewpoint aspects share parallels to that of the English ones in the sense that there is

syncretism between habitual and perfective aspects. In this case, the morphology for perfective aspect, which is expressed in a null form, also conveys habituality. However, the discussion of this paper will only focus on the perfective function of this phonologically empty viewpoint aspect, whose semantics is proposed to be as follows:

(50) $[\![\varnothing]\!]^{w, t, g, c} = [\, \lambda P_{\langle \varepsilon, t \rangle} : [\, \lambda t'_i : \exists e \,.\, \tau(e) \subseteq t' \,\&\, P(e) = T \,]\,]$
    'The time t' contains the 'temporal trace' of an event of P.'

Under this semantics of the perfective aspect, the denotation of the sentence in (51) will then be calculated in (52):

(51) Darth Vader xây   Ngôi Sao Chết.
    Darth Vader build CL   star death
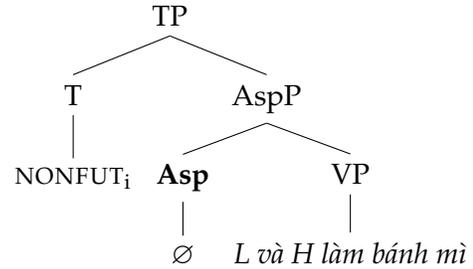   'Darth Vader builds / built the Death Star.'

(52) a.

TP
├── T
│   └── NONFUT$_i$
└── AspP
    ├── Asp
    │   └── ∅
    └── VP
        └── *Darth Vader xây Ngôi Sao Chết*
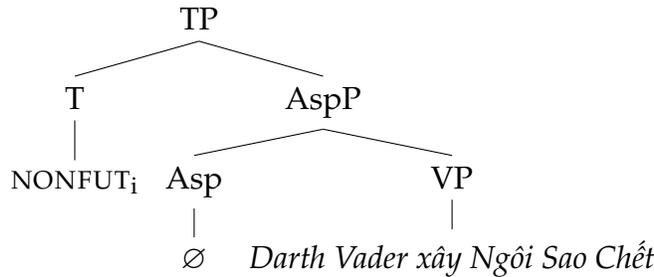
  b. $[\![TP]\!]^{w, t, g, c} = [\, \lambda w : [\, \exists e : [\, build(e)(w) \,\&\, Agent(e)(w) = Darth\ Vader \,\&\,$
    $Theme(e)(w) = the\ Death\ Star \,\&\, \tau(e) \subseteq g(i) \,]\,]\,]$ (where $\neg(t_c < g(i))$)
    'There is an event e of Darth Vader building the Death Star, whose running time τ is included in the contextually salient non-future time g(i).'

This proposed semantics captures the fact that sentences with no overt markings of tense and aspect like (49) can get both present perfective and past perfective interpretations. Therefore, it accounts for the non-future perfective readings obtained in (6), (7), and (8), as well as the contrast between the clause containing *đang* in (14) and the one with the null perfective aspect in (15). Next, we will investigate how these viewpoint aspects interact with the null non-future tense and pick out different relations between temporal intervals.
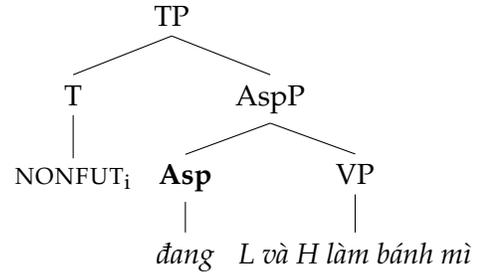
5.3 Event Plurality

The semantics proposed for the progressive *đang* and the null perfective viewpoint aspect in (47) and (50) above also account for the contrast between (39) and (40) presented earlier. In particular, only (39) with the null perfective, but not (40) with *đang*, is true for the given situation in which there exist both past-time and present-time sub-events. The structures for (39) and (40) are then shown in (53) and (54) below, respectively:

(53) Leia và   Han làm   bánh mì.
Leia and Han make sandwich
'Leia and Han make / made
sandwiches.'

```
              TP
             /  \
            T    AspP
            |    /  \
        NONFUTᵢ Asp   VP
            |      |    |
            ∅  L và H làm bánh mì
```

(54) Leia và   Han **đang** làm
Leia and Han PROG make
bánh mì.
sandwich
'Leia and Han are / were making
sandwiches.'

```
              TP
             /  \
            T    AspP
            |    /  \
        NONFUTᵢ Asp   VP
                 |     |
              đang  L và H làm bánh mì
```

The only difference between the two structures is the Asp head. When the NON-FUT tense is combined with the null perfective, it can provide an RT interval for both Leia's and Han's sandwich-making sub-events. However, when it is combined with the progressive *đang*, the RT interval provided cannot cover these same sub-events.

Before taking a closer look at this difference in temporal interaction, I will discuss the event plurality observed in the VP. In particular, both (39) and (40) have cumulative predication in the sense that there are a total of two people working separately on the making of their own sandwiches, and a total of two sandwiches are made. In this case, the predicate contains two sub-events, as illustrated below:

(55)

EVENT	AGENT	THEME
e_1	Leia	sandwich$_1$
e_2	Han	sandwich$_2$

In order to propose the semantics for the VPs in (53) and (54) above, we first need consider the domains of entities and of events. First, the domain of entities D_e should contain both singular and plural individuals. Following Link (1983), if D_e is assumed to be cumulative, then certain subsets of D_e are also cumulative. Such cumulativity can be extended to those sets' characteristic functions, which are the members of $D_{\langle e, t \rangle}$, as illustrated below:

(56) CUMULATIVITY (Properties of Individuals):
$[\lambda P_{\langle e, t \rangle} : [\forall x_e [\forall y_e : [[P(x) \& P(y)] \rightarrow P(x + y)]]]]$

In other words, whenever x and y are in D_e, the sum of x and y, which is x + y, is so in D_e. Secondly, this sum operation is also defined for events, and, consequently, D_s can also be assumed to be cumulative. Cumulativity for the members of $D_{\langle s, t \rangle}$ will then be as follows:

(57) CUMULATIVITY (Properties of Events):

$[\ \lambda P_{\langle s,t \rangle} : [\ \forall e_s\ [\ \forall e'_s : [\ [\ P(e)\ \&\ P(e')\ ] \rightarrow P(e + e')\ ]\ ]\ ]\ ]$

Moreover, following Landman (2000), the basic verb and thematic role predicates of the logical representations are singular predicates that are pluralized with a *-operator that maps properties and relations into their smallest cumulative extensions. Then, according to Kratzer (2008), lexical verbs like 'make' are relations between events and themes, and they are inherently pluralized.

Putting all the key ingredients together, the semantics for the VPs in (53) and (54) is proposed to be as follows:

(58) ⟦ VP ⟧^{w,t,g,c} = [λw : [$\exists$e : [*make(e)(w) & *Agent(e)(w) = Leia + Han & *Theme(e)(w) = sandwich$_1$ + sandwich$_2$]]]

'In world w, there is an event e such that e is a plural event of making whose cumulative agent is the sum of Leia and Han and whose cumulative theme is the sum of two sandwiches.'

The truth-conditions above are satisfied in the given situation summarized in (55), as they are witnessed by the plural event $e_1 + e_2$, the plural entity Leia + Han, and the plural entity sandwich$_1$ + sandwich$_2$.
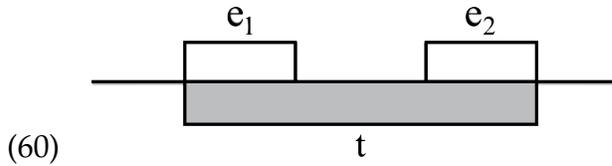
Under the proposed semantics, the denotation of the clause containing the null viewpoint aspect in (39), with the structure in (53), will then be calculated as follows:

(59) a. ⟦ AspP ⟧^{w,t,g,c} = [λt : [λw : [$\exists$e : [*make(e)(w) & *Agent(e)(w) = Leia + Han & *Theme(e)(w) = sandwich$_1$ + sandwich$_2$ & τ(e) $\subseteq$ t]]]

b. ⟦ TP ⟧^{w,t,g,c} = [λw : [$\exists$e : [*make(e)(w) & *Agent(e)(w) = Leia + Han & *Theme(e)(w) = sandwich$_1$ + sandwich$_2$ & τ(e) $\subseteq$ g(i)]]]
(where $\neg(t_c < g(i))$)
'There is a plural event e of Leia making a sandwich and Han making a sandwich, whose running time τ is included in the contextually salient non-future time g(i).'

The null perfective aspect existentially quantifies over the event variables, and situate the ETs, which are the times of Leia making a sandwich and of Han making a sandwich, inside an evaluation interval, which is the RT. The sum of the time of each of these sub-events is still contained within the time span of the non-future RT. which is the interval running from a salient point in the past up until the UT. As a result, the combination of the NONFUT tense and the null perfective provides an RT large enough to cover both the past-time sub-event and the present-time one simultaneously, as illustrated in (60) below:

(60)

As a result, the semantics in (59) correctly predicts that the sentence in (39) is true for the given situation.

On the other hand, the presence of the progressive *đang* flips the inclusion relation of these time intervals, and thus the denotation in (40), with the structure in (54), will then be calculated as follows:

(61) a. $[\![$ AspP $]\!]^{w, t, g, c}$ = [λt : [λw : [$\exists$e : [*make(e)(w) & *Agent(e)(w) = Leia + Han & *Theme(e)(w) = sandwich$_1$ + sandwich$_2$ & t $\subset$ τ(e)]]]

   b. $[\![$ TP $]\!]^{w, t, g, c}$ = [λw : [$\exists$e : [*make(e)(w) & *Agent(e)(w) = Leia + Han & *Theme(e)(w) = sandwich$_1$ + sandwich$_2$ & g(i) $\subset$ τ(e)]]]
   (where ¬(t$_c$ < g(i)))
   'There is a plural event e of Leia making a sandwich and Han making a sandwich, whose running time τ properly includes the contextually salient non-future time g(i).'

Since the progressive aspect puts the RT inside the ET, the semantics in (61) shows that for each of the sub-events' running times, there is an RT properly contained within it. Since the sub-events e$_1$ and e$_2$ of Leia making a sandwich in the past and of Han making a sandwich in the present are disjoint in time, the RTs contained within these time spans cannot form an interval. Consequently, there is no evaluation interval that can cover both a stretch of time in the past as well as the UT. As a result, the proposed semantics captures the fact that clauses containing the progressive *đang* like (40) are not true for situations that include events both in the past and in the present, as illustrated in (62) below:

(62)
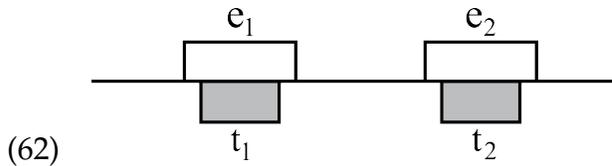
As a result, the semantics proposed earlier for the Vietnamese tense and viewpoint aspects yield the correct truth-conditions to account for the contrast between (39) and (40). Next, other preverbal particles, namely *sẽ* and *đã*, will be examined.
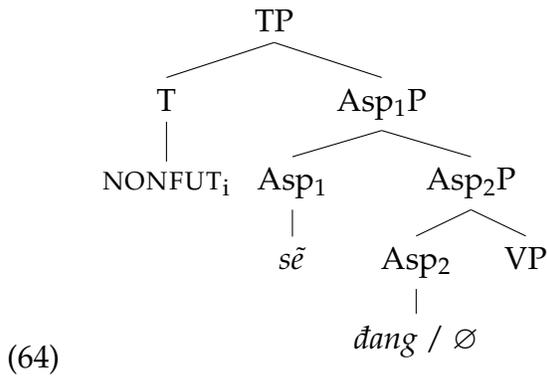
5.4   Futurity

As shown in (9) and (11) above, the presence of *sẽ* is required in questions and answers about future eventualities. Moreover, as shown in (24) and (25), *sẽ* can give rise to both

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ordinary future and 'future in the past' readings. I propose that *sẽ* is the Vietnamese overt spell-out of the English WOLL, originally proposed by Abusch (1985). This WOLL operator is the hypothetical untensed root underlying 'will' and 'would' in English. The surface forms 'will' and 'would' are then proposed to each contain WOLL plus tense, which is either present or past, respectively. I argue that equivalently to the English WOLL, the Vietnamese *sẽ* can then combine with the phonologically empty NONFUT tense morpheme, which picks out a non-future RT. Therefore, the semantics of *sẽ* is proposed to be as follows:
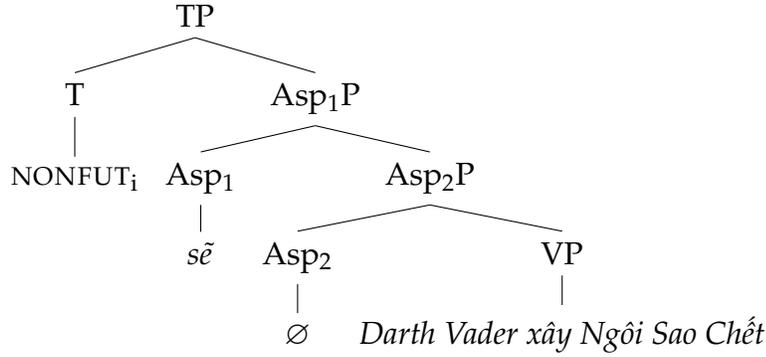
(63) $[\![\text{SE}]\!]^{w, t, g, c} = [\, \lambda P_{\langle i, t \rangle} : [\, \lambda t' : [\, \exists t'' . t'' > t' \ \& \ P(t'') = T \,]\,]\,]$
       'There is an interval t″ that follows t′.'

Future time reference in Vietnamese, then, is achieved by the co-occurrence of the obligatory null NONFUT tense morpheme with the preverbal particle *sẽ*. Furthermore, based on *sẽ*'s interaction with the NONFUT tense and the progressive *đang* shown in (36), (37), and (38), I propose that *sẽ* takes a high Asp head, which is above the one that the viewpoint aspects occupy. This head will also be lower than the Tense head, as illustrated below:

(64)

```
                    TP
           ┌────────┴────────┐
           T              Asp₁P
           │         ┌───────┴───────┐
        NONFUTᵢ    Asp₁           Asp₂P
                     │         ┌─────┴─────┐
                    sẽ       Asp₂         VP
                               │
                           đang / ∅
```

Under the proposed semantics and syntax in (63) and (64), the denotation of (65), a clause containing *sẽ*, is then calculated in (66):

(65) Darth Vader **sẽ**   xây   Ngôi Sao Chết.
      Darth Vader FUT build CL   star death
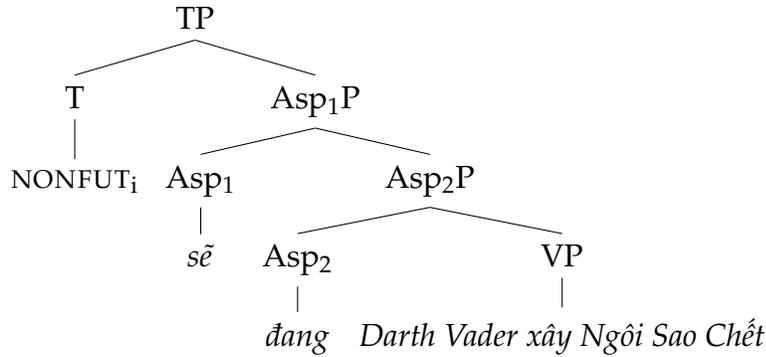   'Darth Vader will / would build CL star death.'

22

(66) a.

```
                    TP
            ┌────────┴────────┐
            T              Asp₁P
            │          ┌──────┴──────┐
        NONFUT_i      Asp₁        Asp₂P
                       │       ┌─────┴─────┐
                       sẽ    Asp₂          VP
                             │              │
                             ∅    Darth Vader xây Ngôi Sao Chết
```

b. ⟦ TP ⟧$^{w, t, g, c}$ = [λw : [$\exists$t′ : [g(i) < t′ & $\exists$e [build(e)(w) & Agent(e)(w) = Darth Vader & Theme(e)(w) = the Death Star & τ(e) $\subseteq$ t′]]]]
(where ¬(t$_c$ < g(i)))
'There is an event e of Darth Vader building the Death Star, whose running time τ is included in a time t′ which follows the contextually salient non-future time g(i).'

This proposed semantics captures the fact that *sẽ* appears when the RT is temporally located after the UT, as illustrated in (9), (11), (24), and (28). It can also account for the 'future in the past' interpretation in (25). Such cases are simply ones where g(i) lies strictly in the past of the UT. Meanwhile, the denotation of (67), a clause that contains both *sẽ* and *đang*, will then be calculated in (68):

(67) Darth Vader **sẽ** **đang** xây Ngôi Sao Chết.
Darth Vader FUT PROG build CL star death
'Darth Vader will be / would be building the Death Star.'

(68) a.

```
                    TP
            ┌────────┴────────┐
            T              Asp₁P
            │          ┌──────┴──────┐
        NONFUT_i      Asp₁        Asp₂P
                       │       ┌─────┴─────┐
                       sẽ    Asp₂          VP
                             │              │
                           đang   Darth Vader xây Ngôi Sao Chết
```

b. ⟦ TP ⟧$^{w, t, g, c}$ = [λw : [$\exists$t′ : [g(i) < t′ & $\exists$e [build(e)(w) & Agent(e)(w) = Darth Vader & Theme(e)(w) = the Death Star & t′ $\subset$ τ(e)]]]]
(where ¬(t$_c$ < g(i)))
'There is an event e of Darth Vader building the Death Star, whose running time τ properly includes a time t′ which follows the contextually salient non-future time g(i).'

As a result, the truth-conditions in (68) correctly predict that the combination of *sẽ* with the progressive aspect *đang* would yield either an ordinary future progressive reading or a 'future in the past' progressive one, as shown in (36), (37), and (38) earlier. Since the semantics for the non-future tense, the viewpoint aspects, as well as the future marker *sẽ* have already been discussed, we will now examine the final preverbal particle, namely *đã*.

5.5 The Perfect Aspect

In languages like English, present perfect cannot combine with specific past time adverbials like 'yesterday.' However, in languages like German, the meaning of present perfect shares striking similarities to that of past perfective. Rothstein (2008) has proposed that (69a) has at least one interpretation that is identical to (69b):

(69)   a. Sigurd **ist** gestern   **angekommen**.
            Sigurd is   yesterday come
            'Sigurd came yesterday.' *(Lit.: 'Sigurd is come yesterday.')*

       b. Sigurd **kam** gestern   **an**
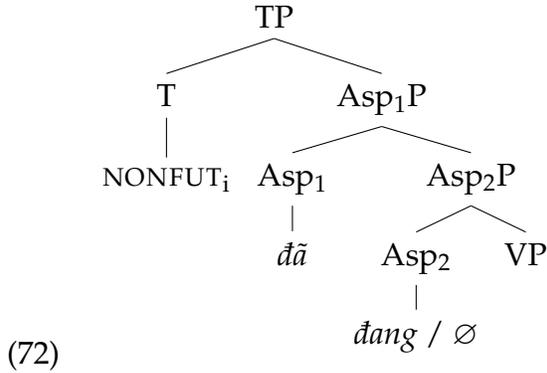   Sigurd came yesterday PTCP
            'Sigurd came yesterday.'

As shown in (10a) above, *đã* in Vietnamese appears to share parallels to the German perfect in the sense that they both can combine with adverbs like 'yesterday'. Rothstein (2008) proposes that the difference in the way present perfect behaves cross-linguistically is due to the different interpretations of the present tense, and not the perfect aspect, in these languages. Pancheva and von Stechow (2004) propose that the semantic contribution of perfect is to set up an interval, called the Perfect Time Span (PTS), which does not have to contain the local evaluation time. In particular, this PTS may precede and partially overlap the RT, or may entirely precede it, as shown in the semantics below, proposed in Pancheva and von Stechow (2004) and Pancheva (2004):

(70) $[\![$ PERFECT $]\!]$ = $[\ \lambda p_{\langle i, t \rangle} : [\ \lambda t : [\ \exists t' . t' \leq t \ \& \ P(t') \ ] \ ] \ ]$
        ($t' \leq t$ iff there is no $t'' \in t'$, such that $t'' > t$)

Based on the Vietnamesẽ đãta presented in (10a), (19), and (20), I argue that *đã* is a perfect marker in Vietnamese. Then, depending on the RT that the NONFUT tense picks out, a clause containing *đã* can get either a past perfect or a present perfect interpretation. Adopting the semantics for PERFECT in (70) above, the semantics of *đã* will then be as follows:

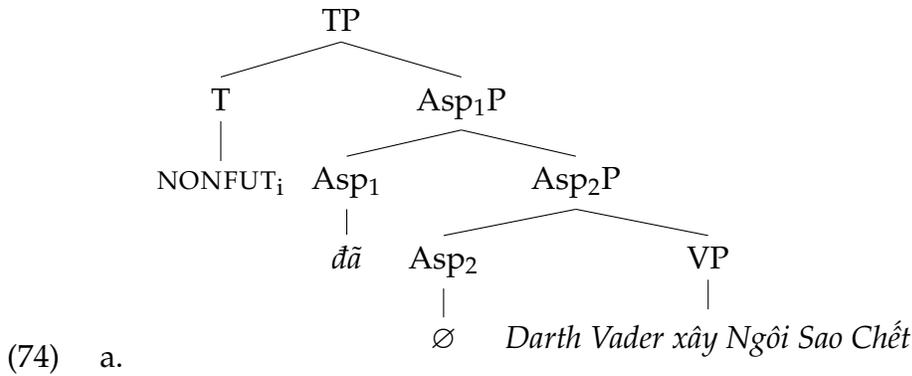(71) $[\![$ DA $]\!]^{w, t, g, c}$ = $[\ \lambda P_{\langle i, t \rangle} : [\ \lambda t' : [\ \exists t'' . t'' \leq t' \ \& \ P(t'') \ ] \ ] \ ]$
        'There is an interval t'' that either strictly precedes t' or has t' as a final subinterval.'

Then, based on the interaction among the non-future tense, the perfect marker *đã*, and the viewpoint aspects presented in (31)-(35), I propose that *đã* occupies the head of an AspP higher than the one of the viewpoint aspects, but lower than the T head, as illustrated below:

(72)

```
                TP
          _____|_____
         T           Asp₁P
         |         ____|____
     NONFUTᵢ    Asp₁      Asp₂P
                 |       ___|___
                đã     Asp₂    VP
                        |
                    đang / ∅
```

With the proposed syntax and semantics for this perfect aspect *đã*, the denotation of a clause that contains *đã* in (73) will then be calculated in (74), as follows:
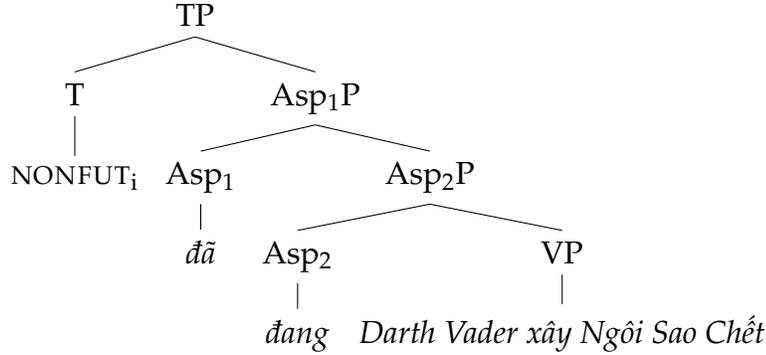
(73)　Darth Vader **đã**　xây　Ngôi Sao Chết.
　　　Darth Vader PERF build CL　star death
　　　'Darth Vader has / had built the Death Star.'

(74)　a.

```
                TP
          _____|_____
         T           Asp₁P
         |         ____|____
     NONFUTᵢ    Asp₁          Asp₂P
                 |         _____|_____
                đã      Asp₂          VP
                         |             |
                         ∅      Darth Vader xây Ngôi Sao Chết
```

　　　b.　$[\![\text{ TP }]\!]^{w, t, g, c}$ = [λw : [$\exists$t' : [t' $\leq$ g(i) & $\exists$e [build(e)(w) & Agent(e)(w) = Darth Vader & Theme(e)(w) = the Death Star & τ(e) $\subseteq$ t']]]]
　　　(where $\neg(t_c < g(i))$)
　　　'There is an event e of Darth Vader building the Death Star, whose running time τ is included in a time t' which either strictly precedes the contextually salient non-future time g(i) or has g(i) as a final subinterval.'

The proposed semantics accounts for the facts presented in (19), where *đã* picks out a time interval running from a salient point in the past up until the RT. Meanwhile, the denotation of (75), a clause containing both the perfect *đã* and the progressive *đang*, will then be calculated in (76), as follows:

25

(75) Darth Vader **đã** **đang** xây Ngôi Sao Chết.
Darth Vader PERF PROG build CL star death
'Darth Vader have been / had been building the Death Star.'

(76) a.

```
                    TP
              ┌──────┴──────┐
              T            Asp₁P
              │         ┌────┴─────┐
          NONFUTᵢ    Asp₁        Asp₂P
                   ┌───┴──┐    ┌────┴────┐
                  đã    Asp₂            VP
                         │               │
                      đang    Darth Vader xây Ngôi Sao Chết
```

b. ⟦ TP ⟧$^{w, t, g, c}$ = [λw : [∃t′ : [t′ ≤ g(i) & ∃e [build(e)(w) & Agent(e)(w) = Darth Vader & Theme(e)(w) = the Death Star & t′ ⊂ τ(e)]]]]
(where ¬(t$_c$ < g(i)))
'There is an event e of Darth Vader building the Death Star, whose running time τ properly includes a time t′ which either strictly precedes the contextually salient non-future time g(i) or has g(i) as a final subinterval.'

Then, the truth-conditions in (76) correctly predict that a clause containing both *đã* and *đang* can yield a present perfect progressive interpretation, as shown in (32), as well as a pluperfect progressive one, as in (33). However, my analysis so far has not discussed how the future marker *sẽ* and the perfect aspect *đã* interact with each other, and thus it cannot account for the future perfect reading in (27). Moreover, the current proposed syntax and the semantics still cannot account for all the readings that clauses containing *đã đang* like (31) can get. In particular, the combination of the progressive *đang*, the perfect *đã*, and the NONFUT tense cannot yield the ordinary future perfect progressive reading in (34) as well as the 'future in the past' perfect progressive one in (35). In the next section, we will explore two hypotheses about how the preverbal particles contribute their meanings to the future perfect constructions in Vietnamese, and then determine which of the two hypotheses is more plausible for the language.
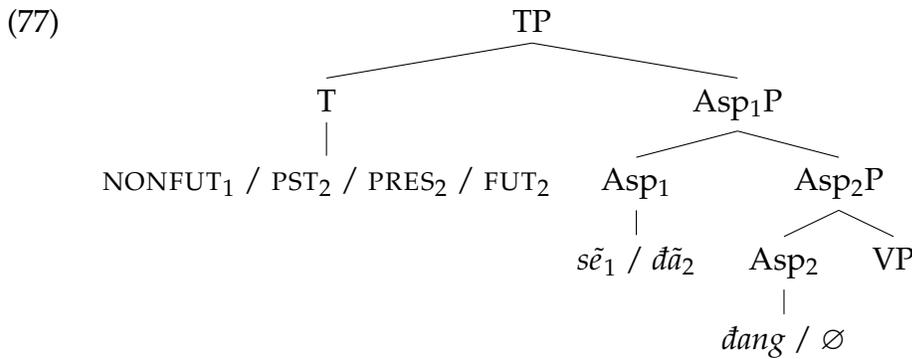
6 Future Perfects

6.1 The 'Same Head' Hypothesis

Both of the hypotheses discussed in this section derive from the observation, presented in (17) above, that *sẽ* and *đã* cannot co-occur within the same clause in Vietnamese. In all future perfect constructions, from the ordinary future perfect one in (27) to the

ordinary future and 'future in the past' perfect progressives in (34) and (35), the only preverbal particle that is overtly marked is the perfect aspect *đã*.

The first hypothesis is inspired by Duffield's (1999, 2007) and Phan's (2013) analyses where *sẽ* and *đã* are put under the same T head. However, in this hypothesis, instead being tense morphemes, these two preverbal particles are proposed to both occupy the same Asp head. *Sẽ* will then combine with the phonologically empty NONFUT tense to yield either the ordinary future reading or the 'future in the past' one, as demonstrated in section 5.4 above. Meanwhile, *đã* especially allows for a tense system that is unrestricted. Instead of being scoped under the NONFUT tense, *đã* co-occurs with three different covert tense morphemes, which are the null past, the null present, and the null future. Consequently, *đã* can combine with each of these tenses to yield the desired past perfect, present perfect, or future perfect interpretation. The structure in (77) illustrates the syntax proposed in this hypothesis. *Sẽ* and *đã* are marked with the subscript '1' and '2,' respectively, indicating that they can only combine with the tense with a matching subscript, as shown below:

(77)

$$
\begin{array}{c}
\text{TP} \\
\diagup \qquad \diagdown \\
\text{T} \qquad\qquad \text{Asp}_1\text{P}
\end{array}
$$

NONFUT$_1$ / PST$_2$ / PRES$_2$ / FUT$_2$ Asp$_1$ Asp$_2$P
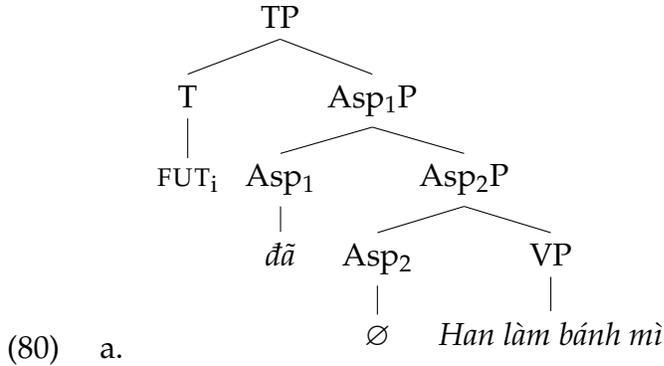
sẽ$_1$ / *đã*$_2$ Asp$_2$ VP

đang / ∅

Similar to the English past tense discussed in (44) above, the lexical entries for the null present and future tense morphemes in (78) will also introduce presuppositions that restrict the RTs, as shown below:

(78) a. $[\![$ PRES$_i$ $]\!]^{w, t, g, c}$ is only defined if $g(i) \subseteq t_c$
If defined, then $[\![$ PRES$_i$ $]\!]^{w, t, g, c} = g(i)$
'The present tense morpheme is only defined if the context c provides a time interval g(i) that surrounds the UT.'

b. $[\![$ FUT$_i$ $]\!]^{w, t, g, c}$ is only defined if $g(i) > t_c$
If defined, then $[\![$ FUT$_i$ $]\!]^{w, t, g, c} = g(i)$
'The future tense morpheme is only defined if the context c provides a time interval g(i) that follows the UT.'

Then, under the syntax and semantics proposed for this hypothesis, the denotation of ordinary future perfect perfectives like (27), repeated in (79) below, will then be calculated in (80), as follows:
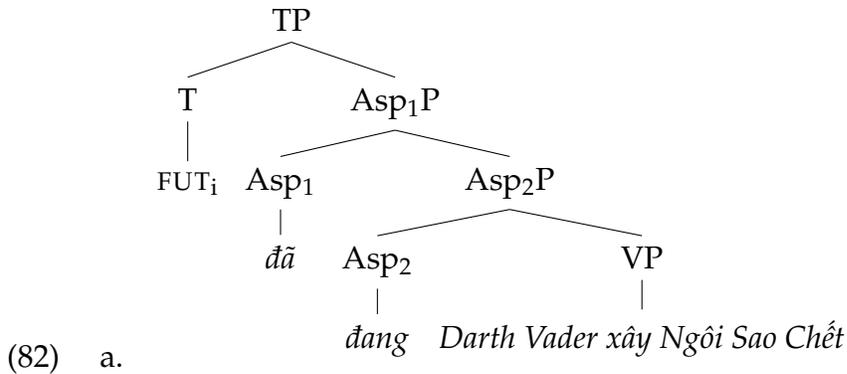
27

(79) Han **đã** làm bánh mì.
Han PERF make sandwich
'Han will have made a sandwich.'

TP
├─ T
│ └─ FUT$_i$
└─ Asp$_1$P
   ├─ Asp$_1$
   │ └─ *đã*
   └─ Asp$_2$P
      ├─ Asp$_2$
      │ └─ ∅
      └─ VP
         └─ *Han làm bánh mì*

(80) a.

b. ⟦ TP ⟧$^{w,\,t,\,g,\,c}$ = [λw : [∃t' : [t' ≤ g(i) & ∃e [make(e)(w) & Agent(e)(w) = Han & Theme(e)(w) = a sandwich & τ(e) ⊆ t']]]] (where t$_c$ < g(i))
'There is an event e of Han making a sandwich, whose running time τ is included in a time t' which either strictly precedes the contextually salient future time g(i) or has g(i) as a final subinterval.'

The truth-conditions above correctly predict that even without *sẽ*, the perfect aspect *đã* alone can still get the future meaning from the null FUT tense. Therefore, sentences containing *đã* like (27) are true for situations describing future perfects. This analysis can also be extended to the ordinary future perfect progressive reading observed in (34). In particular, a denotation of sentences like (34), repeated (81) below, will be calculated in (82), as follows:

(81) Darth Vader **đã** **đang** xây Ngôi Sao Chết.
Darth Vader PERF PROG build CL star death
'Darth Vader will have been building the Death Star.'

TP
├─ T
│ └─ FUT$_i$
└─ Asp$_1$P
   ├─ Asp$_1$
   │ └─ *đã*
   └─ Asp$_2$P
      ├─ Asp$_2$
      │ └─ *đang*
      └─ VP
         └─ *Darth Vader xây Ngôi Sao Chết*

(82) a.

b. $[\![$ TP $]\!]^{w,\,t,\,g,\,c}$ = [λw : [$\exists$t' : [t' $\leq$ g(i) & $\exists$e [build(e)(w) & Agent(e)(w) = Darth Vader & Theme(e)(w) = the Death Star & t' $\subset$ τ(e)]]]]
(where t_c < g(i))
'There is an event e of Darth Vader building the Death Star, whose running time τ properly includes a time t' which either strictly precedes the contextually salient future time g(i) or has g(i) as a final subinterval.'

Nevertheless, the proposed syntax and semantics for this hypothesis cannot capture the 'future in the past' perfect progressive interpretation observed in (35). In order to receive the future perfect meaning, *đã* has to combine with the null FUT tense. However, since FUT restricts the RT to be after the UT, its co-occurrence with *đã* cannot yield 'future in the past' perfect readings at all. Consequently, the 'Same Head' Hypothesis accounts reasonably well for most future perfect constructions, except for the 'future in the past' ones.

6.2 The 'Different Heads' Hypothesis

On the other hand, the second hypothesis maintains that the future marker *sẽ* and perfect aspect *đã* occupy different heads in the syntax, and that they still combine underlyingly in the semantics. However, these is a morphological constraint that makes *sẽ* become unpronounced when it appears next to *đã*. Under this view, *sẽ* takes the highest Asp head, above *đã*, while the viewpoint aspects occupy the lowest Asp head, as illustrated in the following structure:

(83)
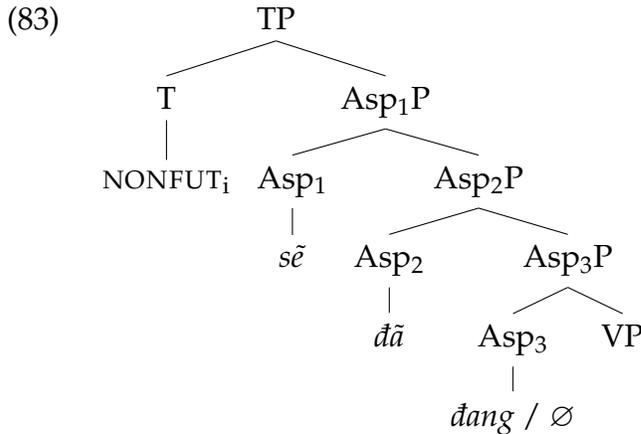
Moreover, in order to account for the complementary distribution of the future marker *sẽ* and the perfect aspect *đã*, a morphological constraint will then be stipulated as follows:

(84)   *sẽ* → ∅ / ___ *đã*

Then, under this view, the denotation of future perfect progressive sentences like (34) and (35), repeated in (85) below, will then be calculated in (86), as follows:

(85) Darth Vader **đã** **đang** xây Ngôi Sao Chết.
Darth Vader PERF PROG build CL star death
'Darth Vader will have been / would have been building the Death Star.'
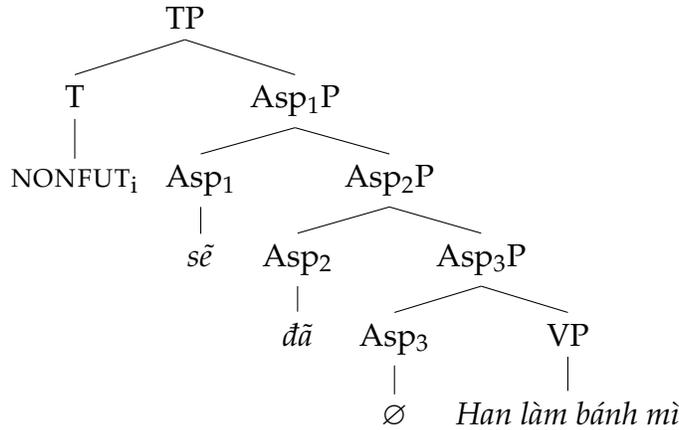
(86) a.
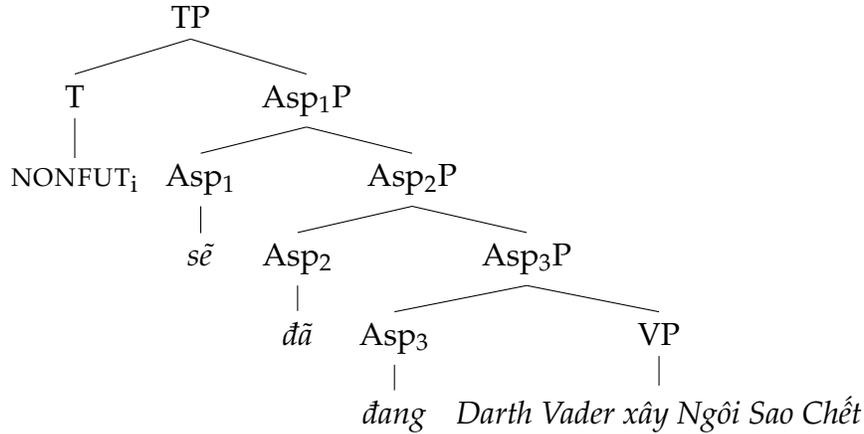
b. $[\![\text{TP}]\!]^{w, t, g, c} = [\ \lambda w : [\ \exists t' : [\ g(i) < t'\ \&\ \exists t'' : [\ t'' \leq t'\ \&\ \exists e : [\ \text{build}(e)(w)\ \&$
Agent(e)(w) = Darth Vader & Theme(e)(w) = the Death Star & $t'' \subset \tau(e)\ ]\ ]\ ]$
$]\ ]$ (where $\neg(t_c < g(i))$)
'There is a time t' following the contextually salient non-future time g(i)
that is preceded by a time t" that is properly contained in an event of Darth
Vader building the Death Star.'

The truth-conditions above correctly predict that clauses overtly marked with *đã*
and *đang* can get ordinary future perfect progressive as well as 'future in the past'
progressive interpretations, as shown in (34) and (35), respectively. While the perfect
and progressive meanings are contributed by the overt markings of *đã* and *đang*, the
future one is obtained with the unpronounced *sẽ*. Moreover, this analysis can also be
extended to the analysis of future perfect perfectives like (27). The denotation of such
sentences, repeated in (87), will then be calculated in (88):

(87) Han **đã** làm bánh mì.
Han PERF make sandwich
'Han will have / would have made a sandwich.'

(88)   a.   TP

```
                          TP
                    ╱           ╲
                  T              Asp₁P
                  │            ╱       ╲
              NONFUTᵢ       Asp₁        Asp₂P
                           │          ╱      ╲
                          sẽ       Asp₂       Asp₃P
                                   │        ╱      ╲
                                  đã     Asp₃        VP
                                         │            │
                                         ∅     Han làm bánh mì
```

b. $[\![\text{ TP }]\!]^{w, t, g, c}$ = [λw : [$\exists$t' : [g(i) < t' & $\exists$t" : [t" $\leq$ t' & $\exists$e : [make(e)(w) & Agent(e)(w) = Han & Theme(e)(w) = a sandwich & τ(e) $\subseteq$ t"]]]]]
(where $\neg$(t_c < g(i)))
'There is a time t' following the contextually salient non-future time g(i) that is preceded by a time t" that contains an event of Han making a sandwich.'

The truth-conditions in (88) correctly predict the future perfect perfective readings that the sentence in (27) can get. Moreover, the proposed syntax and semantics can also account for the contrast between clauses with the presence of *đã* alone like (27) and those with *sẽ* alone like (28), whose truth-conditions are presented in (66) above. Consequently, the 'Different Heads' Hypothesis captures all the facts about future perfect constructions.

Both of the hypotheses presented above are an improvement from the previous accounts proposed by Duffield (1999, 2007) and Phan (2013), as they can fix the problems that the combination of *sẽ* and *đã* yields, while still providing the correct interpretations. However, I will argue that the 'Different Heads' Hypothesis is more plausible. As discussed above, there is already one argument in favor of the 'Different Heads' Hypothesis over the 'Same Head' Hypothesis, which is that only the 'Different Head' Hypothesis can account for the 'future-in-the-past' perfect readings on its own without any additional stipulations. In the next sub-section, I will present supporting evidence for the claim that *sẽ* and *đã* do combine underlyingly in the semantics.

6.3 Arguments for the 'Different Heads' Hypothesis

In Vietnamese, *sẽ* has non-future modal readings. This morpheme can occur in expressions that lack a sense of futurity, as adopted from Enç (1996):

(89)   Nhiều khi Rey **sẽ** bật nhạc to   để làm bạn   nó bực
      many time Rey FUT turn music loud to   make friend 3SG annoyed
      'Rey will sometimes play loud music to annoy his friend.'

Even in situations in which Finn breaks his amplifier, and so, consequently, he can no longer play loud music in the future, the sentence with *sẽ* in (88) still holds true. Then, *sẽ* does not always express future tense, as (88) merely describes a current characteristic or tendency of the subject. In this case, since *sẽ* seems to involve quantification over possible worlds, a 'purely future' semantics for *sẽ* would not hold. On the other hand, *đã* only gives rise to temporal readings, and it never yields modal interpretations. Then, based on this contrast in aspectual and modal uses, it is plausible that *sẽ* and *đã* belong to different heads, and not in the same Asp head.

Moreover, the behaviors of *sẽ* and *đã* in conditional constructions further show that *sẽ* is still present in the semantics, even though it does not appear in the surface structure. First, in future neutral vivids, where the antecedent is interpreted in the present, the presence of *sẽ* is required, as illustrated below:

(90) Nếu Finn uống thuốc, nó **sẽ** khỏe hơn.
if Finn drink medicine 3.SG FUT healthy more
'If Finn takes his medicine, he will get better.'

Secondly, *sẽ* is still obligatorily marked in future less vivids, where the antecedent is 'subjunctive,' as shown below (Iatridou, 2000):

(91) Nếu Han có cánh, nó **sẽ** bay về.
if Han have wing 3SG FUT fly back Corellia
'If Han had wings, he would fly back to Corellia.'

In both (90) and (91), the consequent clauses are future relative to the antecedent clauses. This may serve as the reason why *sẽ*, the marking of futurity, appears in these conditional constructions. However, as illustrated in (92) below, even when the antecedent and the consequent states are overlapping, the presence of *sẽ* is still mandatory:

(92) Nếu Han có cánh, nó **sẽ** rất vui.
if Han have wing 3SG FUT very happy
'If Han had wings, he would be very happy.'

Similar to the non-future modal reading observed in (89), the fact that *sẽ* can appear in cases like (92) provides further evidence that *sẽ* does not function as a pure temporal particle, but it also encodes modal interpretations. Then, the modal analysis of *sẽ* should have the semantics in (93). In the semantics below, *sẽ*, as the modal head, will take as argument the modal base B, which is a variable in the syntax. Moreover, this modal base B is going to have a circumstantial reading (Kratzer, 1981, 1991):

(93) $[\![$ [SE B] VP $]\!]^{w, g}$ is only defined if g(B) is circumstantial.
If defined, then $[\![$ [SE B] VP $]\!]^{w, g} = 1$ iff $\forall w'$ in g(B), $[\![$ VP $]\!]^{w', g} = 1$.

On the other hand, in past counterfactuals, *sẽ* no longer appears in the structure. In such conditionals, *đã* has to be overtly marked, as illustrated below:

(94) Nếu Finn uống thuốc, nó **đã** khỏe hơn.
      If   Finn drink medicine 3.SG PERF healthy more
      'If Finn had taken his medicine, he would have gotten better.'

In this case, even when the consequent is interpreted in the future of the antecedent, *sẽ* does not surface. As demonstrated in (93) above, the semantics of *sẽ* contributes a modal meaning to the conditional constructions. Even though *sẽ* is not overtly marked in (94), the fact that such conditionals still get its modal interpretation suggests that *sẽ* does play a role in the semantics. Meanwhile, when the states in the antecedent and the consequent clauses are overlapping, it is still *đã*, instead of *sẽ*, that appears, as shown in (95) below:

(95) Nếu Han có   cánh, nó **đã** rất vui.
      if   Han have wing 3SG PERF very happy
      'If Han had had wings, he would have been very happy.'

The conditional in (95) share parallels to the one in (92) in the sense that *đã* in past counterfactuals does come with the same non-future modal interpretation that is encoded with *sẽ* in the future less vivid case. In this case, the 'Same Head' Hypothesis, which proposes that *sẽ* and *đã* cannot combine in the semantics, cannot account for the fact that *đã* receives the same interpretation that *sẽ* does. In particular, *đã* can only be combined with pure tenses, and thus the modal readings obtained with the overt marking of *đã* in (94) and (95) cannot be accounted for. Furthermore, as discussed earlier, the combination of *đã* with any of the null tenses cannot yield 'future in the past' perfect meaning. Consequently, the 'Same Head' Hypothesis cannot capture the semantic role of *đã* in the past counterfactual cases.

On the other hand, all of the facts observed in modals and conditionals are predicted by the 'Different Heads' Hypothesis. First, the proposed syntax correctly predicts that *sẽ* should occupy a different head in the structure. In particular, since *sẽ* can yield non-future modal readings, *sẽ* does play a role in quantifying over possible worlds. Therefore, it should be generated in a position higher than *đã*. Secondly, this hypothesis, with *sẽ* and *đã* combine underlyingly in the semantics, can account not only for the similar interpretation that (92) and (95) share, but also for the 'future in the past' meaning observed in (94) and (95). Then, the 'Different Heads' Hypothesis is a more plausible one. Consequently, the syntax for tense and aspect in Vietnamese is the structure shown in (83), where T takes the highest position, followed by *sẽ* (WOLL). Meanwhile, *đã* (PERF) and the viewpoint aspects, which are the null perfective and the progressive *đang*, occupy the two lower Asp heads, respectively.

7 Conclusion

The discussion of this study has focused on how temporal reference in Vietnamese is determined with different preverbal particles. The paper first proposes that every bare verb predicate in the language possesses an obligatory phonologically empty NONFUT tense morpheme, which restricts the RT to being non-future. This provides an explanation for the fact that the RT provided from the combination of this tense with the null perfective aspect is compatible with both past-time and present time sub-events simultaneously. Meanwhile, the other viewpoint aspect, which is overtly marked with the expression *đang*, is proposed to contribute a progressive interpretation. The discussion relates directly to recent approaches to temporal reference in languages that lack overt tense morphology, and thus it offers data from Vietnamese to the debate on semantic variation on tense and aspect across languages.

The paper also presents a detailed investigation of other temporal markings, namely *sẽ* and *đã*. Contrary to the previous accounts in the literature, I argue that *đã* is not a past tense, and *sẽ* is not a future tense. Rather, they are a perfect aspect and an overt spell-out of WOLL-operator, respectively. The morpheme *đã*, then, allows pluperfect as well as present perfect readings, depending on the RT that the NONFUT tense picks out. Likewise, the combination of *sẽ* and this null tense yields both ordinary future and 'future in the past' interpretations. Meanwhile, in order to obtain future perfect meanings, both *sẽ* and *đã* have to combine underlyingly in the semantics. This line of analysis contrasts with other existing accounts of future time reference in Mandarin (Lin, 2012) and Hausa (Mucha, 2013), thereby contributing an argument against pure tenselessness to the debate about future discourse among tenseless languages.

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