The Vietnamese perfect[1]

Thuy BUI — *University of Massachusetts Amherst*

Abstract. The paper seeks to advance understanding of cross-linguistic variation in the semantics of tense and aspect by investigating the distribution and interpretation of the temporal marker *da* in Vietnamese. The study first explores the possibility of accounting for such a marker as an optional past tense. By testing this hypothesis against empirical data, this paper argues that *da* is neither a referential nor a quantificational past tense, but a perfect marker in Vietnamese. The second part of the paper provides a formal analysis of *da*. Based on *da*'s interaction with different adverbial phrases, this study suggests that *da* behaves similarly to the German perfect rather than the English perfect. The discussion relates directly to recent approaches to other languages and offers data from a superficially tenseless language to the discussion on the cross-linguistic semantic variation in 'perfect puzzle.'

Keywords: tense, aspect, Vietnamese.

1. Introduction

Vietnamese lacks obligatory overt tense morphology. Out of the blue, finite matrix clauses with temporally unmarked verbs are compatible with past and present temporal reference, and their viewpoint aspect is perfective, as illustrated in (1):

(1)   Boba lam viec cho Jabba.
           Boba do   work for Jabba
           'Boba works / worked for Jabba.'

There is nonetheless a temporal marker that one may be tempted to describe as a tense: *da*. As shown in (2), if *da* appears in the sentence in (1), that sentence appears to receive a past interpretation:

(2)   Boba **da** lam viec cho Jabba.
           Boba DA do   work for Jabba
           'Boba worked / had worked for Jabba.'

The goal of this paper is to explore the meaning of *da* and its contribution to the temporal interpretation of Vietnamese clauses. The organization of the paper is as follows. In Section 2, I present the background framework for tense and aspect, the basic data for Vietnamese temporal expressions, as well as the semantic proposed for superficially tenseless languages. Then, in Sections 3 and 4, I focus on the puzzle concerning past interpretations in Vietnamese, and show that *da* is neither a referential nor a quantificational past tense, respectively. Section 5 discusses cross-linguistic variation in the 'perfect puzzle,' and demonstrates that *da* behaves

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249

more similarly to the German perfect than the English one. Then, in Section 6, I propose a formal analysis of the perfect marker *da*, and demonstrate how the proposed semantics captures certain key facts. Section 7 concludes the paper.

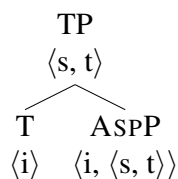## 2. Formal semantic and linguistic background

2.1. The framework

Tense and aspect are conceptualized in the framework of Reichenbach (1947) and Klein (1994). Following Reichenbach (1947), this paper assumes a three-way distinction between the utterance time (UT), the reference time (RT), and the event time (ET):

(3)   a.   UT: The time at which the sentence is uttered.
       b.   ET: The time for which the predicate holds of the subject.
       c.   RT: The time about which the claim is made.

Furthermore, following Klein (1994), this paper assumes tense express a relation between the RT and the UT. In particular, while past tense encodes the precedence relation between the two (RT $<$ UT), present tense locates the RT at the UT (RT = UT), and future tense locates the RT after the UT (RT $>$ UT). In contrast, aspect morphology contributes information regarding the relationship between the RT and the ET. An aspect is perfective when the ET is included within the RT (ET $\subset$ RT). On the other hand, an aspect is imperfective when the inclusion relation between the ET and the RT is reversed (RT $\subset$ ET).

Moreover, this study presumes the pronominal approach to the semantics of tense provided in Kratzer (1998). In this framework, the Tense (T) head, which is of type i, is proposed to be sister to the Aspect Phrase (AspP), which denotes a property of times. As a result, the whole Tense Phrase (TP) denotes a proposition, as illustrated in (4) below:

(4)   *The Syntax for Tense and Aspect in English (Kratzer, 1998):*

$$
\begin{array}{c}
\text{TP} \\
\langle s, t \rangle \\
\diagup \diagdown \\
\text{T} \qquad \text{AspP} \\
\langle i \rangle \quad \langle i, \langle s, t \rangle \rangle
\end{array}
$$

2.2. Temporal reference in Vietnamese

Given that there is no obligatory grammaticalized expressions that impose constraints on the temporal relation between the RT and the UT in Vietnamese, one may be tempted to describe Vietnamese as a superficially tenseless language. Bare verb sentences describe events that are located before or at the UT. When uttered out of the blue, such sentences are only compatible with present or past frame adverbials, as illustrated in (5):

(5)   Hom qua / Bay gio / #Ngay mai Chewie bay den Endor.
      yesterday / now   / tomorrow Chewie fly to   Endor
      'Chewie flew / flies to Endor yesterday / now / #tomorrow.'

Following Matthewson's (2006) analysis of Lillooet, the non-future temporal reference observed in the Vietnamese sentences in (1) and (5) will be assumed to be contributed by a phonologically empty NONFUT tense morpheme whose semantics is shown in (6):

(6)   *The Semantics for Tense in Superficially Tenseless Sentences (Matthewson, 2006):*

      $[\![$ NONFUT$_i$ $]\!]^{g,\,c}$ is only defined if g(i) $\leq$ t$_c$
      If defined, $[\![$ NONFUT$_i$ $]\!]^{g,\,c}$ = g(i)

Under Matthewson's (2006) analysis, the example in (5) is translated by the formula in (7):

(7) $[\![$ (5) $]\!]^{g,\,c}$ = λw $\exists$e [fly-to-Endor(e)(w) & agent(Chewie)(e)(w) & τ(e) $\subseteq$ g(i)]
      (where g(i) < t$_c$)
      'There is an event e of Chewie flying to Endor, whose flying τ is included in the contextually salient past time g(i).'
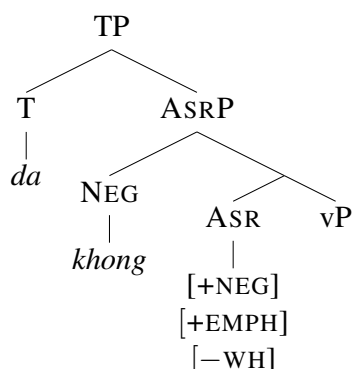
The semantics correctly predicts that superficially tenseless sentences like (5) are compatible only with past or present time reference. In consequence of this semantic restriction, future time reference in Vietnamese must always be marked overtly with the marker *se*, which will not be addressed in the discussion of this paper.

3. Not a referential past

3.1. Referential tense hypothesis

Duffield's (2007) study on the syntax of Vietnamese clausal structure claims that Vietnamese expresses assertion independently of tense or aspect. While he does not focus on the semantics of tense and aspect in Vietnamese, he does propose that Vietnamese is not a tenseless language, and that *da* is a past tense whose marking is almost always optional, which contrasts with the obligatory presence of tense morphology in English.

According to Duffield (2007), Vietnamese tense morphemes, including *da*, have the same syntactic distribution as English ones, but are without the assertion (ASR) component associated with English finite auxiliaries. As a result, Duffield (2007) suggests that the tense morphemes in Vietnamese occupy the Tense node, with lexical verbs remaining in vP, as illustrated below:

(8)   *The Syntax for Tense in Vietnamese (Duffield, 2007):*

```
                    TP
                 /      \
               T        ASRP
               |       /    \
              da    NEG      /  \
                     |     ASR    vP
                   khong    |
                         [+NEG]
                         [+EMPH]
                         [−WH]
```

If *da* is an optional past tense morpheme realized as a Tense head, then it is expected to restrict the temporal reference of a sentence to be past. In this case, *da* requires the RT to temporally precede the evaluation time (EVALT), which is the UT in matrix clauses. Then, under the view in which Vietnamese has a referential tense system, the semantics of a temporally unmarked verb ($\varnothing$) should be similar to (9a), while that of *da* should be like (9b):

(9)   *The Semantics for Referential Tenses in Vietnamese:*

   a. $[\![\varnothing]\!] = [\![\text{PRES}_i]\!]^{w, t, g, c} = [\ \lambda P_{\langle i, t \rangle} : \exists t' \ . \ t' = t \ \& \ P(t') = T \ ]$ 'There is a time t' such that t' equals the EVALT t and P is true at t'.'

   b. $[\![\text{DA}]\!] = [\![\text{PST}_i]\!]^{w, t, g, c} = [\ \lambda P_{\langle i, t \rangle} : \exists t' \ . \ t' < t \ \& \ t' \in g(i) \ \& \ P(t') = T \ ]$
        'There is a time t' such that t' is before the EVALT t and within the interval g(i), and P is true at t'.'

This semantics explains the difference in meaning between (1) and (2). Since *da* imposes a precedence relation between the RT and the EVALT, it plays a role in excluding the present time reference from the matrix clause in (2). Despite the fact the analysis seems to provide a satisfactory record for the contrast in (1) and (2), it still fails to account for many other data points in the language. By showing the behavior of *da* in the sequence of tense constructions in Vietnamese, I argue against the claim that *da* is a referential past tense marker.

3.2. Embedded *da* in complement clauses

Firstly, when the main verb in the matrix clause and the embedded verb in the complement clause are both temporally unmarked (Unmarked-under-Unmarked), the sentence appears to be ambiguous, allowing for either a simultaneous or a back-shifted reading, as illustrated in (10):

(10)   *Unmarked-under-Unmarked in Vietnamese Complement Clauses:*

   a.   Nam 1980 Obi-Wan $\varnothing$ noi la   Luke $\varnothing$ song o Tatooine luc   do.
        year 1980 Obi-Wan $\varnothing$ say that Luke $\varnothing$ live   on Tatooine time that
        'In 1980, Obi-Wan said that Luke lived on Tatooine then.'
        (*Lit.:* 'In 1980, Obi-Wan says / said that Luke lives / lived on Tatooine then.')

    b.   Nam 1980 Obi-Wan ∅ noi la   Luke ∅ song o Tatooine nam 1977.
           year 1980 Obi-Wan ∅ say that Luke ∅ live   on Tatooine year 1977
           'In 1980, Obi-Wan said that Luke lived on Tatooine in 1977.'
           (*Lit.:* 'In 1980, Obi-Wan says / said that Luke lives / lived on Tatooine in 1977.')

This is one of the cases showing that the presence of *da* is not obligatory in Vietnamese clauses. Both the matrix and the embedded clauses can obtain the past readings with a temporally unmarked verb. Furthermore, the event in the embedded clause can be anchored at the matrix time as well as any point of time before that. This contrasts to the behaviors of referential tenses in English, as illustrated in the case of Present-under-Present sentences like (11) below:

(11)   *Present-under-Present in English Complement Clauses:*

    a.   *In 1980, Obi-Wan **says** that Luke **lives** on Tatooine then.
    b.   *In 1980, Obi-Wan **says** that Luke **lives** on Tatooine in 1997.

When both of the the matrix and the embedded verbs denote present tense, the sentences are unacceptable whether the embedded time is located at or prior to the matrix time. The same behavior also shows when a past tense morpheme is embedded under a present tense matrix verb, as illustrated below:

(12)   *Past-under-Present in English Complement Clauses:*

    a.   *In 1980, Obi-Wan **says** that Luke **lived** on Tatooine then.
    b.   *In 1980, Obi-Wan **says** that Luke **lived** on Tatooine in 1997.

In this case, whenever the matrix time happens before the UT in English, the matrix verb cannot be in present tense. Secondly, Vietnamese sentences in which an unmarked verb is embedded in a complement clause under *da*, which appears in the matrix clause, (Unmarked-under-*Da*), also allow for either a simultaneous or a back-shifted reading, as shown in (13):

(13)   *Unmarked-under-Da in Vietnamese Complement Clauses:*

    a.   Nam 1980 Obi-Wan **da** noi la   Luke ∅ song o Tatooine luc do.
          year 1980 Obi-Wan DA say that Luke ∅ live   on Tatooine time that
          'In 1980, Obi-Wan said that Luke lived on Tatooine then.'
          (*Lit.:* 'In 1980, Obi-Wan said that Luke lives / lived on Tatooine then.')
    b.   Nam 1980 Obi-Wan **da** noi la   Luke ∅ song o Tatooine nam 1977.
          year 1980 Obi-Wan DA say that Luke ∅ live   on Tatooine year 1977
          'In 1980, Obi-Wan said that Luke lived on Tatooine in 1977.'
          (*Lit.:* 'In 1980, Obi-Wan said that Luke lives / lived on Tatooine in 1977.')

(13) shows that when *da* appears in the matrix clause, a temporally unmarked verb in the embedded clause can still locate the event of Luke living on Tatooine at or prior to the past matrix time. In contrary to the flexibility shown in the Vietnamese data, it is unacceptable for Present-under-Past sentences in English to have a present tense embedded verb when the ET denoted in the embedded clause occurs before the UT:

(14)   *Present-under-Past in English Complement Clauses:*

     a.   *In 1980, Obi-Wan **said** that Luke **lives** on Tatooine then.

     b.   *In 1980, Obi-Wan **said** that Luke **lives** on Tatooine in 1997.

However, in English complement clauses, the interpretation of a past tense morpheme under another past tense morpheme (Past-under-Past) is ambiguous between a simultaneous reading and a back-shifted reading (Ogihara and Sharvit, 2012), as indicated in (15) below:

(15)   *Past-under-Past in English Complement Clauses:*

     a.   In 1980, Obi-Wan **said** that Luke **lived** on Tatooine then.

     b.   In 1980, Obi-Wan **said** that Luke **lived** on Tatooine in 1977.

Similarly, in Hebrew, a language that makes use of referential tenses like English, Past-Under-Past sentences also allow for simultaneous readings (Ogihara and Sharvit, 2012), as shown in (16) below:

(16)   *Past-under-Past in Hebrew Complement Clauses:*

     Han **xasav**   se   Leia **ahava** oto az.
     Han thought that Leia loved him then
     'Han thought that Leia loved him then.'

If *da* behaves like a referential past tense, *Da*-under-*Da* sentences in Vietnamese should also allow simultaneous readings like the Past-under-Past ones in English and Hebrew. Nevertheless, in Vietnamese, sentences in which *da* is embedded under another *da* (*Da*-under-*Da*) never allows for a simultaneous reading, as shown in (17):

(17)   *Da-under-Da in Vietnamese Complement Clauses:*

     a.   *Nam 1980 Obi-Wan **da** noi la   Luke **da** song tren Tatooine luc   do.
           year 1980 Obi-Wan DA say that Luke DA live   on   Tatooine time that
           'In 1980, Obi-Wan said that Luke lived on Tatooine then.'

     b.   Nam 1980 Obi-Wan **da** noi la   Luke **da** song tren Tatooine nam 1977.
           year 1980 Obi-Wan DA say that Luke DA live   on   Tatooine year 1977
           'In 1980, Obi-Wan said that Luke lived on Tatooine in 1977.'

A *da* embedded under another *da* in complement clauses always forces a back-shifted reading. This fact suggests that *da* does not behave similarly to the referential past tenses in English and Hebrew. As a result, the possibility of *da* being a referential past tense is ruled out. The behavior of *da* in embedded contexts is further investigated with the sequence of tense cases observed in relative clauses.

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Edited by Robert Truswell, Chris Cummins, Caroline Heycock, Brian Rabern, and Hannah Rohde

254

3.3. Embedded *da* in relative clauses

Similarly to the Unmarked-Under-Unmarked cases in complement clauses, sentences in which unmarked verbs are present in both the matrix clause and the relative clause allow for either a simultaneous or back-shifted reading, as shown in (18):

(18)   *Unmarked-under-Unmarked in Vietnamese Relative Clauses:*

    a.   Nam 1980 Obi-Wan ∅ gap   mot nguoi ∅ song o   Tatooine luc   do.
           year 1980 Obi-Wan ∅ meet one person ∅ live   on Tatooine time that
           'In 1980, Obi-Wan met a person who lived on Tatooine then.'
           (*Lit.:* 'In 1980 Obi-Wan meets / met a person who lives / lived on Tatooine then.')
    b.   Nam 1980 Obi-Wan ∅ gap   mot nguoi ∅ song o   Tatooine nam 1977.
           year 1980 Obi-Wan ∅ meet one person ∅ live   on Tatooine year 1977
           'In 1980, Obi-Wan met a person who lived on Tatooine in 1977.'
           (*Lit.:* 'In 1980 Obi-Wan meets / met a person who lives / lived on Tatooine in 1977.')

Likewise, sentences in which an unmarked verb is embedded in a relative clause under a matrix verb marked with *da* are also ambiguous, allowing for either a simultaneous or back-shifted interpretation, as illustrated in (19):

(19)   *Unmarked-under-Da in Vietnamese Relative Clauses:*

    a.   Nam 1980 Obi-Wan **da** gap   mot nguoi ∅ song o   Tatooine time that.
           year 1980 Obi-Wan DA meet one person ∅ live   on Tatooine time that
           'In 1980, Obi-Wan met a person who lived on Tatooine then.'
           (*Lit.:* 'In 1980, Obi-Wan met a person who lives / lived on Tatooine then.')
    b.   Nam 1980 Obi-Wan **da** gap   mot nguoi ∅ song o   Tatooine year 1977.
           year 1980 Obi-Wan DA meet one person ∅ live   on Tatooine year 1977
           'In 1980, Obi-Wan met a person who lived on Tatooine in 1977.'
           (*Lit.:* 'In 1980, Obi-Wan met a person who lives / lived on Tatooine in 1977.')

The key fact shown in (19) is that Vietnamese allows a simultaneous reading, even when *da* appears in the matrix clause. This is where an important difference between English and Vietnamese manifests itself. In particular, in English relative clauses, the availability of a simultaneous reading of the present depends on the matrix tense (Ogihara and Sharvit, 2012). In Present-under-Past sentences, a matrix past blocks a simultaneous reading, as in (20):

(20)   *Present-under-Past in English Relative Clauses:*

    a.   *In 1980, Obi-Wan **met** a person who **lives** on Tatooine then.
    b.   In 1980, Obi-Wan **met** a person who **lives** on Tatooine now.

The fact that an indexical reading is allowed in (20b) shows that the time of the embedded event is required to overlap the present. In Vietnamese, however, such restriction does not exist in the relative clauses. Moreover, this availability of simultaneous readings of ∅-under-*Da* sentences in Vietnamese, a superficially tenseless language, shares parallels to the patterns observed in

Japanese, a tensed language. In particular, Japanese sentences in which a past tense morpheme in a relative clause in embedded under a present tense matrix verb also allows for both the simultaneous and indexical readings, as demonstrated in (21):

(21)   *Present-under-Past in Japanese Relative Clauses:*

    a.   1980-nen-ni   Obi-Wan-wa Tatooine-ni   sono-toki **sun-deiru** hito-ni
        1980-year-DAT Obi-Wan-TOP Tatooine-DAT that-time live-PRES person-DAT
        at-ta.
        meet-PST
        'In 1980, Obi-Wan met a person who lived on Tatooine then.'
        (*Lit.:* 'In 1980, Obi-Wan met a person who lives on Tatooine then.')

    b.   1980-nen-ni   Obi-Wan-wa Tatooine-ni   genzai **sun-deiru** hito-ni
        1980-year-DAT Obi-Wan-TOP Tatooine-DAT now   live-PRES person-DAT
        at-ta.
        meet-PST
        'In 1980, Obi-Wan met a person who lives on Tatooine now.'

The behavior of the embedded *da* in relative clauses once again shows that *da* does not behave like the English past, further supporting the claim that *da* is not a referential past tense. However, the embedded *da* in Vietnamese appears to share similarities with the embedded past tense in Japanese. This pattern then raises a possibility that tenses in Vietnamese behave like those in Japanese. If this is the case, then it is plausible for *da* to be argued to function similarly to a quantificational past tense.

4. Not a quantificational past

4.1. Quantificational tense hypothesis

If tenses in Vietnamese behave like those in Japanese, then they are ambiguous, and may get quantificational interpretations (Ogihara and Sharvit, 2012). In particular, one can assume that unmarked verbs are by default interpreted in the present, and thus can have similar semantics to Japanese present tense. Meanwhile, since *da* is more temporally marked than an unmarked verb, past temporal reference is more strongly preferred. As a result, under this quantificational tense approach, the semantics of temporally unmarked verbs as well as *da* in Vietnamese is as follows:
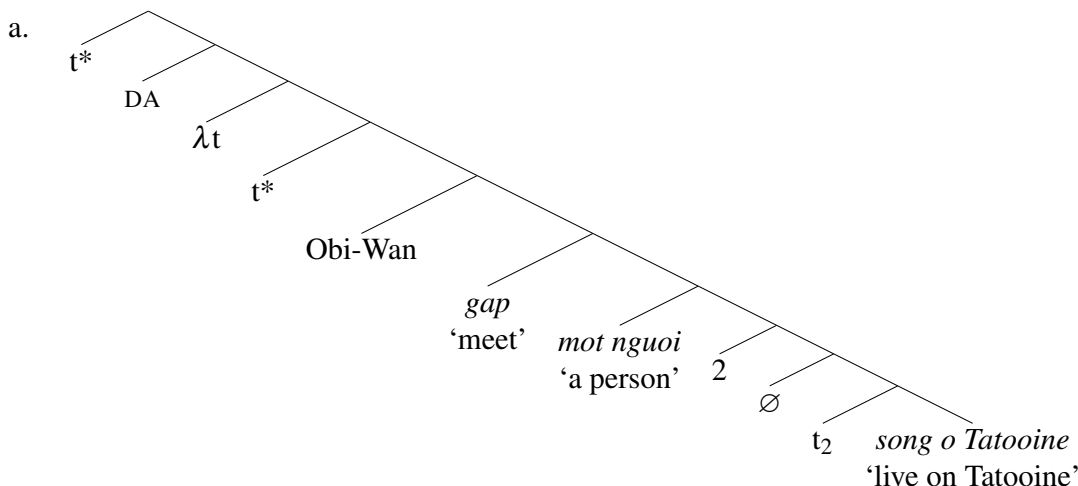
(22)   *The Semantics for Quantificational Tenses in Vietnamese:*

    a. $[\![\varnothing]\!] = [\![\text{PRES}]\!]^{w, t, g, c} = [\, \lambda P_{\langle i, t \rangle} : [\, \lambda t' : \exists t'' . \, t'' = t' \, \& \, P(t'') = T \,]\,]$
        'There is a time t'' such that t'' equals the time t' and P is true at t''.'

    b. $[\![\text{DA}]\!] = [\![\text{PST}]\!]^{w, t, g, c} = [\, \lambda P_{\langle i, t \rangle} : [\, \lambda t' : \exists t'' . \, t'' < t' \, \& \, P(t'') = T \,]\,]$
        'There is a time t'' such that t'' is before the time t' and P is true at t''.'

In this case, the quantificational tenses in (23) are of type $\langle \langle i, t \rangle, \langle i, t \rangle \rangle$. In movement of quantificational tense, the lambda created by movement is λt. Moreover, the trace of movement is [t*], which always denotes EVALT. In other words, $[\![t*]\!]^{w, t, g, c}$ equals t. Then, the sentence

in (19a) has the Logical Form (LF) structure as well as the predicted truth conditions as follows:

(23)   In 1980, Obi-Wan met a person who lives / lived on Tatooine then.

a.

```
      t*
         DA
            λt
               t*
                  Obi-Wan
                     gap
                     'meet'   mot nguoi
                              'a person'   2
                                             ∅
                                               t₂   song o Tatooine
                                                     'live on Tatooine'
```

b. $[\![(19a)]\!]^{w, t, g, c} = \exists t'$. $t' < t$ & $\exists x$. x is a person in w & x lives on Tatooine in w at t' & Obi-Wan meets x in w at t'.
       'There is a time t' such that t' is before the time t, and there is an x such that x is a person in world w, and x lives on Tatooine in w at t', and Obi-Wan meets x in w at t'.'

The semantics of *da* as a quantificational past tense correctly predicts that the Unmarked-Under-*Da* cases in Vietnamese relative clauses should allow for a simultaneous reading. This analysis further rejects the hypothesis that *da* is a referential past tense. In this case, the function of *da* has now been narrowed down to be either that of a quantificational past tense or a perfect. I then argue that *da* is not a quantificational tense, since not only does *da* is shown to have the ability to arrange events in a sequence but it also felicitously appears in future contexts.

4.2. Event ordering

When it comes to arranging events in a sequence, the presence of *da* is mandatory. As demonstrated in (24) below, *da* puts one event further into the past than the other. In particular, when it is uttered in the scenario described in (24), (24a) is infelicitous because it denotes that the two events occur simultaneously. On the other hand, (24b) is felicitous because *da* puts the event of R2-D2 fixing C-3PO before the event of Lando entering the room.

(24)   *Context:* Lando walks into the room, and he finds R2-D2 standing next to a newly repaired C-3PO.
        a. #Lando di   vao phong. Chewie sua C-3PO.
            Lando walk into room   Chewie fix C-3PO
            'Lando walked into the room. Chewie fixed C-3PO.'

b.   Lando di   vao phong. Chewie **da** sua C-3PO.
Lando walk into room   Chewie DA fix C-3PO
'Lando walked into the room. Chewie had fixed C-3PO.'

In this case, the first sentence, which has a NONFUT tense, sets up the RT for the next sentence. *Da* then requires the second sentence to be interpreted within the past of the event of the first sentence. Then, *da* appears to function similarly to a perfect marker. Furthermore, the fact that the presence of *da* is acceptable in cases like (25) provide further evidence supporting the claim that *da* is a perfect rather than a tense.

(25)   Lando di   vao phong luc 2 gio. Den 2 gio 15 phut,   R2-D2 **da** sua C-3PO.
Lando walk into room at 2 hour. By 2 hour 15 minute R2-D2 DA fix C-3PO
'Lando walked into the room at 2. By 2:15, R2-D2 had fixed C-3PO.'

In (25), the first sentence does not set up the RT for the sentence that follows it. In fact, it is the temporal adverbials *den 2 gio 15 phut* 'by 2:15' that sets up the RT for the second sentence. Given that *da* can combine with this adverbial phrase, it suggests that *da* does not pick out one particular point of time in the past. Rather, *da* contributes an interval of time running from one salient point in the past up until 2:15. Then, the possibility of *da* being a quantificational tense has been ruled out.

5. The 'present perfect' puzzle

5.1. Modification by 'yesterday'

In English, the present perfect is not compatible with specific past time adverbs like 'yesterday' (Pancheva and von Stechow, 2004), as demonstrated in (26) below:

(26)   Luke: "Why **is** Yoda tired?"
a.   Obi-Wan: "He **trained** hard yesterday."
b.   Obi-Wan: *"He **has trained** hard yesterday."
c.   Obi-Wan: #"He **had trained** hard yesterday."

In the scenario in which Luke asks a question like the one in (26), the only acceptable answer that Obi-Wan can utter is (26a). Since the question is put in present tense, it sets up the present time reference for the whole discourse. Since there is no past time in the discourse to impose a pluperfect interpretation, (26c) is infelicitous when uttered in this context. Meanwhile, even though the present perfect does not encounter such problem, the sentence in (26b) is still ill-formed. This problem in English, which arises due to the incompatibility between the present perfect and adverbs like 'yesterday', has been discussed in the literature as the 'present perfect puzzle'.

In order to account for the unacceptability in cases like (26b), Pancheva and von Stechow (2004) proposes three main ingredients, which are the Perfect Time Span (PTS), the perfect aspect (PERF), and the semantics for 'yesterday', as illustrated below:
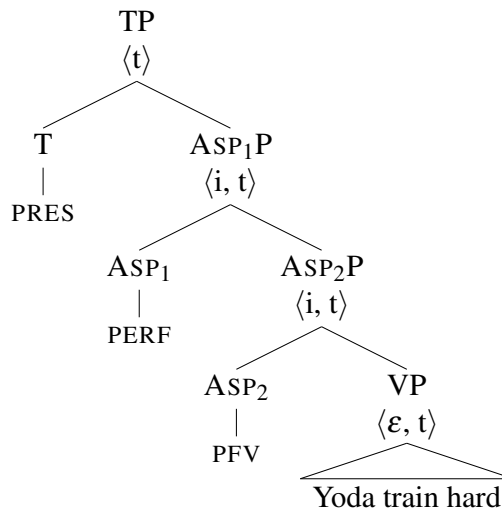
(27)   *The ingredients for the 'present perfect puzzle' (Pancheva and von Stechow, 2004):*

    a.   PTS(t', t) = t is a final subinterval for t'

    b. $[\![$ PERF $]\!]^{w, t, g, c}$ = [$\lambda P_{\langle i, t \rangle}$: [$\lambda t'$: $\exists t''$. PTS(t'', t') & P(t')]]

        'There is a time t'' such that t' is a final subinterval for t'' and P is true at t'.'

    c. $[\![$ yesterday $]\!]^{w, t, g, c}$ = [$\lambda t'$: t' $\subseteq$ the day preceding c(time)]

        't' is a subinterval of the day preceding the context time.'

Then, the LF structure as well as the predicted truth conditions for the sentence in (26b) without the modification of the adverbial phrase 'yesterday' are as follows:

(28)   Yoda trained hard.

    a.

```
                              TP
                             ⟨t⟩
                         /         \
                        T          ASP₁P
                        |          ⟨i, t⟩
                      PRES       /        \
                             ASP₁        ASP₂P
                              |          ⟨i, t⟩
                            PERF       /       \
                                    ASP₂        VP
                                     |         ⟨ε, t⟩
                                    PFV      /       \
                                        Yoda train hard
```

    b. $[\![$ (26b) $]\!]^{w, t, g, c}$ = $\exists t'$. PTS(t', c(time)) & $\exists e$. train(e, w) & Ag(e, w) = Yoda & T(e) $\subseteq$ t'

        'There is a time t' such that the context time is a final subinterval for t', and there is an e such that e is an event of training in world w, and the agent of e is Yoda, and the time of e is a subinterval of t'.'

Given the semantics in (27), there is nowhere in (28) that the adverb 'yesterday' can be added consistently. In particular, if 'yesterday' modifies Asp₁P, its contribution is an internal contradiction, as illustrated in (29):

(29)   [$\exists t'$. PTS(t', c(time)) & $\exists e$. train(e, w) & Ag(e, w) = Yoda & T(e) $\subseteq$ t' & **c(time)** $\subseteq$ **the day preceding c(time)**]

Meanwhile, if 'yesterday' modifies Asp₂P, its contribution contradicts the statement that the context time is a final subinterval for t', as demonstrated in (30):

(30)   [$\exists t'$. **PTS(t', c(time))** & $\exists e$. train(e, w) & Ag(e, w) = Yoda & T(e) $\subseteq$ t' & **t'** $\subseteq$ **the day preceding c(time)**]

As a result, it is not possible to combine the present perfect with specific past time adverbials in English. However, unlike English, in Vietnamese, a sentence containing *da* can also contain 'specific' past time adverbs like *hom qua* 'yesterday,' as illustrated in (31):

(31)   Hom qua Yoda **da** luyen tap cuc kho.
         yesterday Yoda DA train   hard
         'Yoda trained hard yesterday.'
         (*Lit.:* 'Yoda trained / has trained hard yesterday.')

As discussed above, because the question that Luke asks sets up the present tense for the discourse, *da* cannot be interpreted as a pluperfect. Consequently, *da* functions as a present perfect in this case. Therefore, this behavior of *da* as a perfect marker contrasts what has been observed in the English perfect. Nevertheless, this pattern of *da* is remarkably similar to the German perfect, as illustrated in (32) below:

(32)   Yoda **hat**   gestern   hart **trainiert**.
         Yoda have.3SG.PRES yesterday hard trained.PTCP
         'Yoda trained hard yesterday.'
         (*Lit.:* 'Yoda has trained hard yesterday.')

Similar to Vietnamese *da*, the German perfect is also compatible with specific past time adverbials like 'yesterday.' This suggests that the 'present perfect puzzle' that is present in English and other languages is absent in German and Vietnamese. As a result, *da* is more alike to the German perfect than the English one.

5.2. Interaction with 'always'

In English, even when a past tense morpheme co-occurs with the adverb 'always,' it still indicates that the event discussed is no longer true at the UT. In contrast, when the present perfect appears with the adverb 'always,' it ends up entailing that the state in question still holds at the present (Pancheva, 2004), as demonstrated in (33) below:

(33)   a.   Finn always **was** a Stormtroope.
         b.   Finn **has** always **been** a Stormtrooper.

In this case, Finn is no longer a Stormtrooper in (33a). On the other hand, (33b) entails that he is still a Stormtrooper. The semantics for (33a) and (33b) is provided in (34a) and (34b), respectively:

(34)   a. $⟦$ (33a) $⟧^{w, t, g, c}$ = [$\exists t'$. $\mathbf{t'} < \mathbf{c(time)}$ & $\forall t''$. $t'' \in t' \rightarrow \exists e$. Finn-is-a-Stormtrooper(e, w) & T(e) $\subseteq$ t']
         'There is an interval t' which completely precedes c(time), every subpart of which contains an eventuality of Finn being a Stormtrooper.'

b. $[\![$ (33b) $]\!]^{w, t, g, c}$ = $[\exists t'$. **PTS(t', c(time))** & $\forall t''$. $t'' \in t' \rightarrow \exists e$. Finn-is-a-Stormtrooper(e, w) & T(e) $\subseteq$ t' $]$
      'There is an interval t' which contains c(time), every subpart of which contains an eventuality of Finn being a Stormtrooper.'

The semantics in (34) correctly predicts that (33a) can be followed consistently with the phrase 'until he ran away from the First Order,' while (33b) cannot, as illustrated in below:

(35)   a.   Finn always **was** a Stormtrooper, until he ran away from the First Order.
        b.   *Finn **has** always **been** a Stormtrooper, until he ran away from the First Order.

On the other hand, besides *da*'s interaction with 'yesterday' discussed earlier, the combination between *da* and *luon* 'always' shows that the function of *da* is distinct from that of the English perfect. In particular, when *da* appears with *luon* 'always,' it does not end up entailing that the state in question also holds at the present, as illustrated in (36):

(36)   a.   Finn **da luon**   la   Stormtrooper.
              Finn DA always COP Stormtrooper
              'Finn has always been / had always been / always was a Stormtrooper.'
        b.   Finn **da luon**   la   Stormtrooper cho den khi   no   chay khoi First Order.
              Finn DA always COP Stormtrooper for till when 3SG ran   away First Order
              'Finn always was a Stormtrooper until he ran away from the First Order.'
              (*Lit.:* 'Finn has always been / had always been / always was a Stormtrooper until he runs / ran away from the First Order.')

In (36a), like English, the combination of *da* as a perfect marker and adverbials like *luon* 'always' entails that the state in question also holds at the present. Nevertheless, unlike what has been observed in the English sentence in (35b), the Vietnamese sentence in (36b) is not ungrammatical at all. In this case, the state in question only holds until the time at which Finn ran away from the First Order. The fact that sentences like (36b) are acceptable further demonstrates that *da* in Vietnamese behaves more like the German perfect, as shown in (37):

(37)   Finn **ist**   immer ein Sturmtruppler **gewesen** bis er vor des Ersten
        Finn is.3SG.PRES always a   Stormtrooper been   until he from the First
        Ordnung wegrannte
        Order   ran-away.3SG.PST
        'Finn always was a Stormtrooper until he ran away from the First Order.'
        (*Lit.:* 'Finn has always been a Stormtrooper until he ran away from the First Order.')
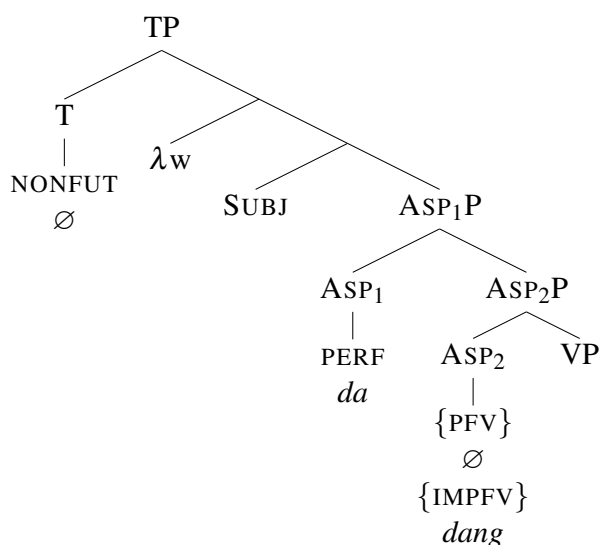
Based on the interaction of *da* with different types of adverbs such as *hom qua* 'yesterday' and *luon* 'always', it is shown that if *da* is indeed a perfect, then it shares similarities to the German perfect rather than the English perfect.

6. Formal analysis

6.1. Proposal

Based on the language data as well as the comparisons with other languages, a formal analysis for the Vietnamese perfect is proposed. Firstly, as for the syntax, a NONFUT tense morpheme occupies the head of the TP, and *da* is the head of the AsPP, as illustrated below:

(38)   *The Syntax for Tense and Aspect in Vietnamese:*

```
                        TP
                   /          \
              T              λw
              |             /    \
          NONFUT       SUBJ      ASP₁P
              ∅                 /      \
                           ASP₁        ASP₂P
                            |          /     \
                          PERF      ASP₂     VP
                           da        |
                                   {PFV}
                                    ∅
                                  {IMPFV}
                                   dang
```

Secondly, the semantics for *da* is provided below:

(39)   *The Semantics for the Perfect in Vietnamese:*
        $[\![\text{DA}]\!]^{w, t, g} = [\lambda P_{\langle i, t \rangle} : [\lambda t' : \exists t'' . t'' \leq t' \, \& \, P(t'')]]$
        'There is an interval t'' that either strictly precedes t' or has t' as a final subinterval such that P(t'') = T.'

The proposed semantics captures certain key facts in Vietnamese, including the availability of simultaneous readings with complement clauses, as well as the semantic consequences of interactions with different adverbial phrases.

6.2. Availability of simultaneous readings

As mention earlier in the paper, the simultaneous reading can be obtained in Unmarked-under-*Da* in Vietnamese complement clauses, as in (13a). Meanwhile, *Da*-under-*Da* sentences like (17a) always forces a back-shifted reading. These crucial cases showing the different temporal interpretations when it comes to sequences of tense in Vietnamese are repeated below:

(40)   a.   Nam 1980 Obi-Wan **da** noi la   Luke ∅ song o   Tatooine luc   do.
                year 1980 Obi-Wan DA say that Luke ∅ live   on Tatooine time that
                'In 1980, Obi-Wan said that Luke lived on Tatooine then.'
         b.   *Nam 1980 Obi-Wan **da** noi la   Luke **da** song o   Tatooine luc   do.
                year 1980 Obi-Wan DA say that Luke DA live   on Tatooine time that
                'In 1980, Obi-Wan said that Luke had lived on Tatooine then.'

Under the proposed semantics, the contrast between these two sentences is correctly predicted. In particular, in (40a), a simultaneous reading can be obtained via a *de re* NONFUT tense. Meanwhile, in (40b), the embedded PERF *da* places the PTS t' prior to the EVALT t. The semantics of the embedded clause in (40b) is then proposed to be as follows:

(41) $[\![(50b)]\!]^{w, t, g, c}$ = [λw' : [λt' : ∃t" . t" ≤ t' & ∃e . Luke-live-on-Tatooine(e, w') & T(e) ⊆ t"]]
         'There is an interval t" which could completely precede t', every subpart of which contains an eventuality of Luke living on Tatooine.'

As a result, under this semantics, the state of being a Stormtrooper does not properly overlap the EVALT in sentences like (40b). This means that the semantics proposed for *da* correctly predicts that it is impossible to get the simultaneous reading when *da* is embedded in the lower clause.
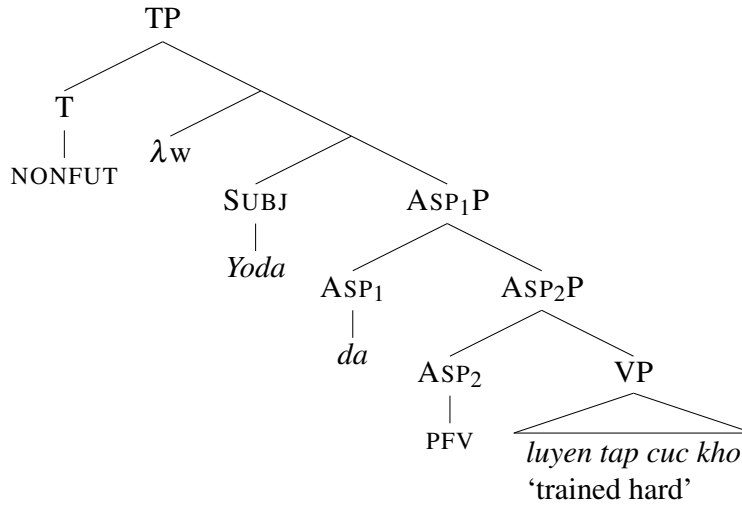
6.3. Semantic consequences of modification by 'yesterday'

Furthermore, the proposed semantics can also account for the interaction between *da* and specific past time adverbials like *hom qua* 'yesterday' (Pancheva, 2004), as shown in cases like (31), repeated as (42) below:

(42)   Hom qua Yoda **da** luyen tap cuc kho.
         yesterday Yoda DA train   hard
         'Yoda trained hard yesterday.'
         (*Lit.:* 'Yoda trained / has trained hard yesterday.')

The syntax for the sentence in (42) without the modification of the adverbial phrase yesterday is as follows:

(43)   Yoda has trained hard.

```
                        TP
              ┌──────────┴──────────┐
              T              λw
              │        ┌──────────┴──────────┐
           NONFUT    SUBJ              ASP₁P
                       │          ┌──────┴──────┐
                     Yoda       ASP₁        ASP₂P
                                  │      ┌──────┴──────┐
                                 da    ASP₂          VP
                                        │        ┌────┴────┐
                                       PFV    luyen tap cuc kho
                                              'trained hard'
```

With the structure proposed in (43), if the adverbial phrase *hom qua* 'yesterday' modifies ASP₁P, its contribution still leads to an internal contradiction. This is because in matrix clause, the time t equals the context time, as demonstrated in (44):
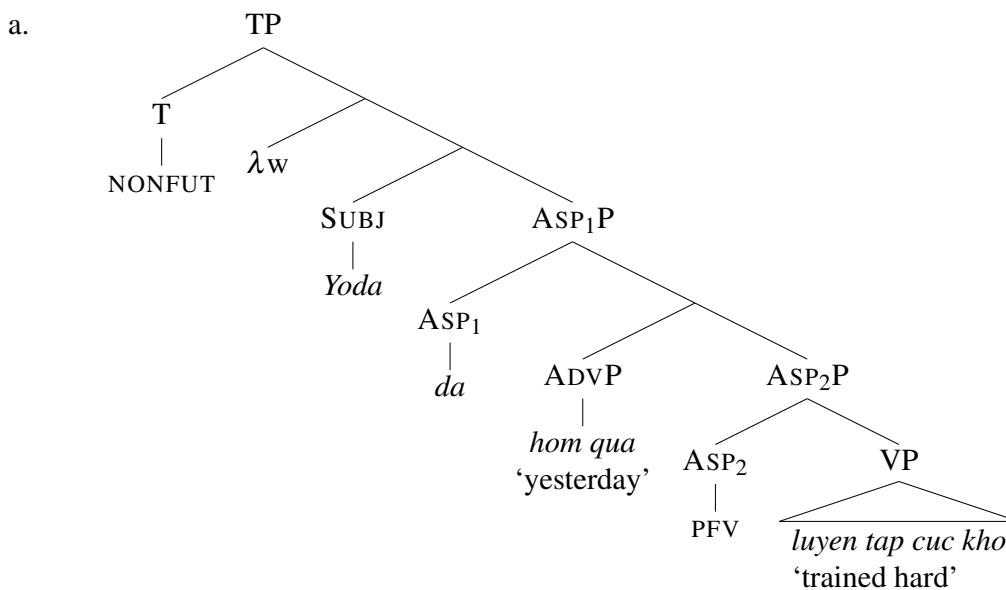
(44)   [$\exists t'$. $t' \leq t$ & $\exists e$. train(e, w) & Ag(e, w) = Yoda & T(e) $\subseteq$ t" & **t $\subseteq$ the day preceding c(time)**]

Nevertheless, if the adverbial phrase (ADVP) *hom qua* 'yesterday' modifies Asp₂P, its contribution is consistent, since it locates the PTS, and so the ET, within the day preceding the context time, as demonstrated in (45) below:

(45)   [$\exists t'$. $t' \leq t$ & $\exists e$. train(e, w) & Ag(e, w) = Yoda & T(e) $\subseteq$ t" & **t' $\subseteq$ the day preceding c(time)**]

Following the logic presented in (45), then the syntax as well as the predicted truth conditions for the sentence in (42) is as follows:

(46)   Yoda has trained hard yesterday.

   a.

   [Tree diagram:]

   TP
   - T
     - NONFUT
   - λw
     - SUBJ
       - *Yoda*
     - ASP₁P
       - ASP₁
         - *da*
       - ADVP
         - *hom qua*
           'yesterday'
       - ASP₂P
         - ASP₂
           - PFV
         - VP
           - *luyen tap cuc kho*
             'trained hard'

   b. $[\![(52)]\!]^{w, t, g, c}$ = [$\exists t'$. $t' \leq t$ & $\exists e$. come(e, w) & Ag(e,w) = Yoda & $T(e) \subseteq t'$ & $t' \subseteq$ the day preceding c(time)]
         'There is an interval t' which could completely precede the context time t by one day, every subpart of which contains an eventuality of Yoda training hard.'

As a result, with the semantics for 'yesterday' in (27c), the proposed semantics of *da* in (39) correctly predicts that the contribution of adverbs like *hom qua* 'yesterday' is consistent.

6.4. Semantic consequences of interaction with 'always'

Lastly, the proposed semantics of *da* also captures the fact that the interaction between *da* and *luon* 'always' does not necessarily entail that the state in question holds at the present. Instead, it can just hold up until some point of time in the past, as shown in cases like (36).

Then, the semantics for (36a) is as follows:

(47) $[\![(36a)]\!]$ = [$\exists t'$. $t' \leq t$ & $\forall t''$. $t'' \in t'$ $\rightarrow$ $\exists e$. Finn-is-a-Stormtrooper(e,w) & $T(e) \subseteq t'$]
         'There is an interval t' which could completely precede the context time t, every sub-part of which contains an eventuality of Finn being a Stormtrooper.'

The semantics in (36a) accounts for the fact that the sentence in (36b) does not entail that Finn is a Stormtrooper now.

7. Conclusion

In this study, I have investigated the behavior of the morpheme *da* in both matrix and embedded contexts, and argued that *da* in Vietnamese functions similarly to neither a referential past tense

in English nor a quantificational one in Japanese. Then, based on the role it plays in a sequence of events, I have concluded that *da* in Vietnamese is a perfect marker.

Furthermore, after examining *da*'s interaction with different adverbial phrases, I suggested that *da* is more alike to the German perfect than the English perfect. This discussion relates directly to recent approaches to other languages such as English or German, and contributes data from Vietnamese to the discussion on the semantic variation on the 'present perfect puzzle' across languages.

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